Peer Effects in Young Adults' Marital Decisions[1]

Job Market Paper

Effrosyni Adamopoulou[2]

Universidad Carlos III de Madrid

November 11, 2011

Abstract. This paper studies peer group effects on marital decisions. We use data from Waves I and III of the National Longitudinal Study of Adolescent Health (Add Health). This database contains detailed information on adolescents' high school friends as well as their marital behavior later in life. We construct a balanced panel for the years 1995-2002 using the calendar of all past and current relationships of the respondents, which allows us to recover the marital status of each individual and of her friends at any given year. Hence, we are able to analyze how the marital transitions of individuals depend on the marital status of their friends. We use panel data, instrumental variables techniques, and exploit the timing of friendship formation to identify the effect of peers on marital decisions. Our results after controlling for various observable characteristics of individuals and their friends show that peer effects in marital decisions are significant, especially among females. Robustness checks using former and placebo friends support our results, and indicate that actual peers do matter.

JEL classifications: A14, J12, J16, Z13

Keywords: peer effects, friends, marriage, cohabitation, marital decisions

[1]I am grateful to Nezih Guner for his valuable advice and guidance. Many thanks to Lorenzo Burlon, Paul DiMaggio, Juan Jose Dolado, Francesco Fasani, Daniel Garcia, Christos Genakos, James Heckman, Loukas Karabarbounis, Ezgi Kaya, Valérie Lechene, Jeremy Lise, Matilde Machado, Dolores de la Mata, Heiko Rachinger, Anna Sanz de Galdeano, Michele Pellizzari, Konstantinos Tatsiramos, Yves Zenou, the participants in the UC3M Student Workshop, in the UCL Student Work in Progress Seminar, in the UIB Applied Seminar, in the Conference on the Economics of the Family in honour of Gary Becker in Paris, in the 2011 ESPE meeting in Hangzhou, in the 2011 CRETE in Milos, in the 2011 AIEL meeting in Milan, and in the 2011 ASSET meeting in Evora for useful discussions.

[2]Department of Economics, Universidad Carlos III de Madrid, Calle Madrid 126, Getafe (Madrid), 28903, SPAIN. Email: eadamopo@eco.uc3m.es.

1 Introduction

Friends are an important part of individuals' life and constitute, together with the family, the social circle in which individuals develop. Friends often spend time together participating in the same activities (sports, school, etc), discussing about different topics and exchanging ideas. It is not then unrealistic to think that friends might affect each other's behavior through their opinions or through imitation. In fact, there is a large literature on peer group effects showing that friends actually affect, among others, the individual performance at school (Hoxby, 2000; Sacerdote, 2001; Calvó-Armengol, Patacchini and Zenou, 2009; Boucher, Bramoullé, Djebbari, and Fortin, 2010), obesity (Cohen-Cole and Fletcher, 2008), smoking habits (Gaviria and Rafael, 2001; Powell, Tauras and Ross, 2005; Fletcher, 2010), and/or alcohol consumption (Clark and Loheac, 2007; Fletscher, 2011), fertility (Kuziemko, 2006; Ciliberto, Miller, Nielsen, and Simonsen, 2010; Hensvik and Nillson, 2010), productivity (Falk and Ichino, 2006), the probability of finding a job (Topa, 2001; Calvó-Armengol and Jackson, 2004; Cappellari and Tatsiramos, 2010), and the probability of engaging in criminal activities (Glaeser, Sacerdote and Scheinkman, 1996; Patacchini and Zenou, 2011).[3]

But what about marital decisions? Getting married or cohabiting is a decision that many young couples face. In order to make a decision, a potential couple might discuss with their parents, sibling or friends. If most friends of an individual are married, she may also want to get married in order, for example, to avoid being stigmatized by her friends. Likewise, if many of her friends are cohabiting she may also decide to do so. What the couple considers as a norm depends not only on the society as a whole (e.g. religion or tradition) but also on one's circle of close friends.

In this paper, we investigate whether the marital decisions of one's friends have any effect on one's own marital decisions. We use direct information on individuals' high school friends from the National Longitudinal Study of Adolescent Health (Add Health). We construct a balanced panel using the calendar of all past and current relationships of the respondents, which allows us to recover the marital status and other characteristics of each individual and of her friends at any given year. We motivate our empirical exercise with a model of conformism and our results show that

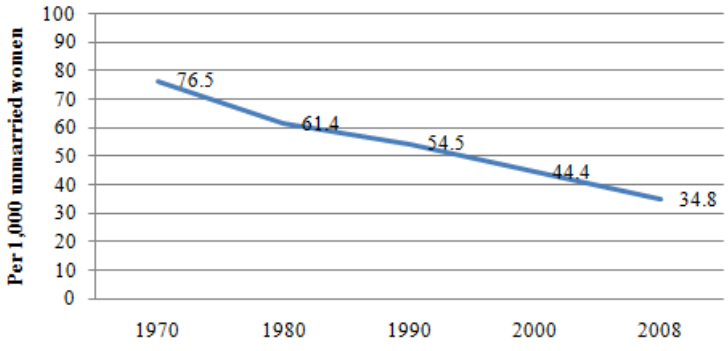
[3]See Blume, Brock, Durlauf, and Ioannides (2011) for an excellent review of papers on social interactions.

conformism might be the key mechanism behind the observed peer group effects. We find that when the percentage of married peers increases by 10% the probability of an individual getting married increases by 3.1 percentage points. The effect is statistically significant for females but not for males.

The biggest obstacle in identifying peer effects in marital decisions of the individuals has been data availability. In order to investigate the extent of peer group effects, Billari et al. (2007) use simulated data to show that social influence is the key driving force of the process of first marriage. Drewianka (1999 and 2003) uses data from PUMS and shows that a 10 percentage point increase in the fraction of persons aged 16-44 in a geographical area who are single leads to a decrease in individual's propensity to marry of an order of 1.5-2.0 percentage points. Moreover, he finds evidence that social effects operate through markets (search externality) and not directly through stigma or role modelling. Not only initiation but also termination of marriage might be influenced by peers. McDermott, Folwer, and Christakis (2009) show that divorce can spread between friends, siblings and coworkers.

Let us first discuss briefly the rapid changes in marital behavior that took place during the last decades. As Figure 1 shows, the marriage rate in the US has fallen drastically. Similar changes have been observed also in other developed countries.

Figure 1. Marriage Rate in the U.S.

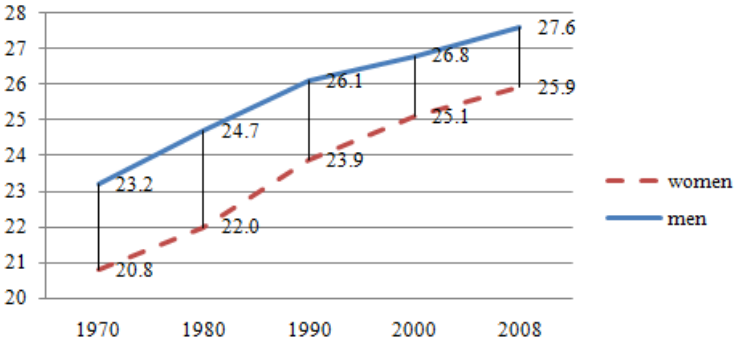


Source: National Center for Family & Marriage Research

Many studies have tried to identify the factors behind the drop in the marriage rate (declining gender gap, Becker 1981; contraceptive pill, Goldin & Katz, 2002; household production technology, Greenwood & Guner, 2009 to name a few). These forces are likely to be amplified if there exist peer group effects that create a social multiplier.

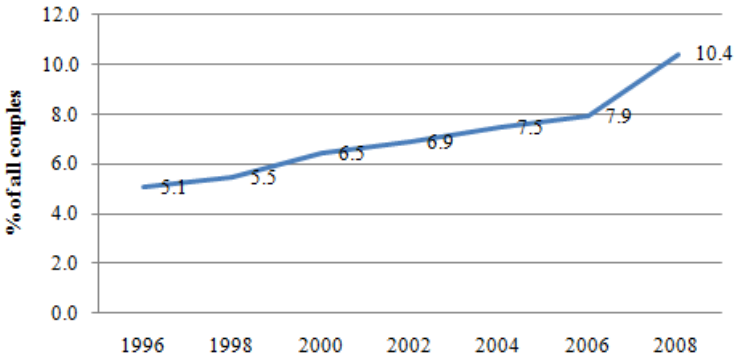
As a result, the effect of family-friendly policies, tax reforms, divorce laws, etc. will be augmented. Part of this drop is also due to the increase in the median age at first marriage (Figure 2). Individuals nowadays get married at an older age than what they used to do in the past. Hence, also the timing of marriage may be contagious in the sense that individuals decide to get married after observing that one of their peers got married.

Figure 2. Estimated Median Age at First Marriage in the U.S.



Source: U.S. Census Bureau

Figure 3. Cohabitation Rate in the U.S.



Source: U.S. Census Bureau

Cohabitation is a more recent phenomenon that is becoming more and more popular especially among young couples (Bumpass & Lu, 2000). This upward trend (Figure 3), that is also present in western European countries, has been attributed to economic factors like the gender wage gap and the household production technology (Adamopoulou, 2010), female labor force participation and tertiary education (Kalmjin, 2007) or tax

reforms (Leturcq, 2009). In addition to these factors, there might be an imitation effect (peer effect) at work that self-enforced the increase of cohabitation. Our aim is to identify peer effects in the decision to get married or cohabit as well as in the timing of these actions. In the next section we use a model of conformism in order to study a possible way friends can influence an individual's marital decisions. The model motivates the empirical analysis that follows.

2 Model

The model is based on Patacchini and Zenou (2011), who study juvenile delinquency using a model of conformism. The key element of the model is the notion of conformism, i.e., quoting the authors description, *'the idea that the easiest and hence best life is attained by doing one's very best to blend in with one's surroundings and to do nothing eccentric or out of the ordinary in any way'.* Conformism might also be important for young adults when they decide whether to get married or cohabit. We first define the network structure of agents' friendships, and we then describe the preferences of the agents.

There is a finite number of agents $N = \{1, ..., n\}$. Let g denote a particular network. We use the n-square adjacency matrix G of a network g to keep track of the direct connections in this network (see Jackson, 2008). Two agents i and j are directly connected in the network g if and only if $g_{ij} = 1$. We set $g_{ii} = 0$, i.e. the agent cannot be a friend of herself. The set of direct connections of agent i is $N_i(g) = \{j \neq i \mid g_{ij} = 1\}$, which is of size $g_i = \sum_{j=1}^{n} g_{ij.}$ In general $N_i(g) \neq N_j(g)$, unless the network is complete and everybody is a friend of everybody.

Each agent decides whether to stay single and just date with a partner, cohabit or get married. We assume, therefore, that there are many different degrees of formality that the relationship can take ranging from very informal (dating) to very formal (getting married). We denote the formality of the relationship by f_i. We then define the average formality of the relationships of i's friends as $\overline{f_i}(g) = \frac{1}{g_i} \sum_{j=1}^{n} g_{ij} f_j$

Each agent selects a degree of formality $f_i \geq 0$ for her relationship and receives a

payoff $u(f_i, \overline{f_i})$ given by the utility function

$$u_i(f_i, \overline{f_i}) = a + b_i f_i - \pi f_i \phi - c f_i^2 - d(f_i - \overline{f_i})^2,$$

with $a, c, d > 0$, and $b_i > 0$, $\forall i$.

There is a benefit from formalizing the relationship, which is given by the term $a + b_i f_i$. The agents are ex ante heterogeneous with respect to b_i. The parameter b_i is assumed to be deterministic and observable by all agents in the network and it represents observable characteristics of individual i (e.g., gender, race, age, education, religion etc.) and to the observable average characteristics of individual i's friends (contextual effects). More specifically,

$$b_i(x) = \sum_{m=1}^{M} \beta_m x_i^m + \frac{1}{g_i} \sum_{m=1}^{M} \sum_{j=1}^{n} \theta_m g_{ij} x_j^m,$$

where x_i^m are observable characteristics of individual i, the term $\frac{1}{g_i} \sum_{m=1}^{M} \sum_{j=1}^{n} g_{ij} x_j^m$ captures the contextual effects, and β_m, θ_m are parameters.

There is also a cost of formalizing the relationship, which is given by the term $-\pi f_i \phi - c f_i^2$. The parameter π is the probability that the realtionship ends and the parameter ϕ is the cost of ending the relationship. The cost of ending a relationship increases as the formality increases, i.e. it is more costly to separate if one is married than if one is cohabiting. Likewise, it is more costly to separate if one is cohabiting with a partner than if one is just dating this partner. The term $-c f_i^2$ is needed so as the cost function to be convex. Transiting from cohabitation to marriage is a more complicated procedure than transiting from dating to cohabitation.

The last term in the utility function, $-d(f_i - \overline{f_i})^2$, reflects the influence of friends' behavior on own action. Each agent tries to minimize the distance between herself and her group of friends. The agent loses utility from failing to conform to others. Parameter d represents the taste for conformity.

In this framework there exists a unique Nash equilibrium (Patacchini and Zenou, 2011) where each individual chooses the optimal formality of relationship f_i^*

$$f_i^* = \frac{d}{c+d} \overline{f_i} + \frac{b_i}{2(c+d)} - \frac{\pi \phi}{2(c+d)},$$

which is increasing in $\overline{f_i}$. In other words, the more formal the relationships of one's friends are, the more the individual will formalize her own relationship.

In the next section we test this result empirically and we try to figure out whether the percentage of individuals' married and cohabiting friends has any effect on individuals' decisions to enter into marriage or cohabitation. We also discuss other possible mechanisms that may drive the peer effect in marital decisions and provide evidence that support conformism as the main mechanism.

3 Data

Add Health is a longitudinal study of a nationally representative sample of adolescents in grades 7-12 in the United States during the 1994-95 school year.[4] In Wave I the study started with an in-school questionnaire that was administered to more than 90,000 students from 80 high schools and 52 middle schools. A subsample of them (around 20,000) were also asked to complete in-home interviews and were followed in subsequent waves (II, III, and IV). The last wave was conducted in 2008, when the sample was aged 24-32. Adolescents had to answer questions about their family background, school performance, area of residence, tobacco and alcohol consumption, criminal activities as well as about sexual behavior (contraception, pregnancy, HIV and STD). In Wave I adolescents' mothers were also interviewed, and as a result, we can obtain information on their characteristics as well. However, mothers were not interviewed in the subsequent waves so it is not posible to update this information.

Wave III in-home interviews took place in years 2001 and 2002 and were completed by around 15,000 respondents aged 18-28. In Wave III the respondents had to list all their current and previous sexual relationships (82% non missing responses) providing detailed information on the starting and ending date, whether they cohabited and how long, when they got married etc. Using this information we create a balanced panel for the years 1995-2002. For example, if a respondent listed a relationship with a partner for the years 2000-2002 with whom she started cohabiting in 2001 and she got married

[4]This research uses data from AddHealth, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris. Special acknowledgment is due to Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from AddHealth should contact AddHealth, Carolina Population Center, 123 W. Franklin Street, Chapel Hill, NC 27516-2524, USA (addhealth@unc.edu).

in 2002, we will consider her single for the year 2000, cohabiting in 2001, and married in 2002. If the respondent had more than one relationship in a given year we keep the one with the longest overall duration. The procedure is similar to the one in Xie et al. (2003), and Raley et al. (2007) that analyze the determinants of marital transitions.

In Wave I, data collectors assigned an identification number to each student and provided a list of all students to the respondents in order to identify their friends. Respondents were allowed to list up to five male friends and up to five female friends. We treat two students as friends if at least one of the two has identified the other as his/her friend. As long as their nominated friends were also interviewed (i.e. they were part of the random subsample who completed the in-home survey), one can construct for each respondent a set of friends with detailed Add Health information. Given that the data represent a subsample of students within schools, not all nominated friends are interviewed and as a result, the measures of friends' characteristics will be imperfect. However, since the sampling scheme was random within grades, and most friends were in the same grade, the measures should be on average correct.

In Wave III, when the respondents were between ages 18 and 28, those who were in grades 7 and 8 in Wave I (two youngest grades), were interviewed about their current and former friends. In particular, data collectors presented each respondent with a list of 10 names and asked if any of them is currently or used to be their friend. For former friends, they also asked to state when the friendship ended and why. This list was created, based on an algorithm, using information from club membership and other school activities. As a result, it is possible for some respondents to identify current as well as former friends from this list. Furthermore, for former friends it is possible to know the year that the friendship has ended. By matching the identification numbers of friends to respondents' identification numbers we obtain information on the characteristics of nominated friends. In this way we know at any given year the marital status of the respondent and the marital status of his/her friends. Our final sample consists of 2,644 respondents with non missing relationship history that have at least one friend with non missing relationship history as well. The descriptive statistics of the individuals in our final sample are similar to the ones of all the individuals interviewed in wave III, ensuring that the final sample is still representative (see Table A1).

4 Empirical Strategy

Individual behavior may move conjointly with average peer group behavior for three different reasons. i) Endogenous effects; the behavior of the individual is causally influenced by the behavior of the group. This is the peer effect that we are trying to estimate. ii) Contextual effects; the behavior of the individual is influenced by the characteristics of the group. For example an individual might decide to get married because her friends are very religious independently from whether the friends are married or not. iii) Correlated effects; the individual and the group behave in the same way due to similar environments that are unobserved or due to endogenous friendship formation/sorting. This arises either from the fact that both the individual and her friends are subject to common unobserved shocks or because the individual selects friends who are similar to her.

Manski (1993) shows that identifying the endogenous and the contextual effects separately in a reduced form linear model is not possible. This is called the reflection problem and it is due to the fact that group behavior is by definition the aggregation of individual behavior. Solutions that have been proposed in order to solve the reflection problem consist of using instrumental variables techniques, or using panel data (see Bramoullé, Djebbari, and Fortin, 2009; Boucher et al., 2010). Instruments are used in order to generate variation in peer behavior that is independent from individual behavior. Examples of identification strategies with instrumental variables include Ciliberto et al. (2010) that use the fertility of the siblings of one's colleagues as an instrument for the fertility of one's colleagues, and Fletscher (2011) that uses the alcohol consumption of the parents of one's classmates as an instrument for the alcohol consumption of one's classmates. The basic idea is that siblings or parents of peers affect the behavior of the peers but have no independent effect on the respondent's behavior. De Giorgi, Pellizzari, and Redaelli (2010), and Pattachini and Zenou (2011) exploit the information about the whole network of friendships and instrument the behavior of the respondent's friends with the characteristics of friends of friends who are not directly linked with the respondent. With panel data one can focus on changes in the behavior over time in order to deal with the reflection problem. In this way, the reflection problem will disappear since the characteristics of the peers are already determined at the time that the change in individual behavior (transition

into employment, having a child, getting married etc.) takes place. Clark and Lohéac (2007) use panel data from Waves I and II of AddHealth to examine risky behavior (the consumption of tobacco, alcohol and marijuana). Kuziemko (2006) uses panel data in order to show that fertility is contagious among siblings. Cappellari and Tatsiramos (2011) use panel data to show that employed friends increase the probability of transition into employment. In an alternative identification strategy they consider the effect of the respondent on friends' transitions and instrument the respondent's employment status with the health status.

We instrument the percentage of married and cohabiting peers using the contextual variables. We thus assume that there is no direct effect of friends' characteristics on respondents' decisions and use friends' characteristics as instruments for their marital behavior. This procedure is common in the literature (e.g. Gaviria and Raphael, 2001; Powell et al., 2005).

What about correlated effects? One might worry that people make new friends as they get married, often through their spouse. Hence, it is normal for married people to make new friends who are also married. In this case endogeneity would be a serious problem in identifying the peer effects. In the current analysis we consider friends since high school and we have information about friendship dynamics. This solves part of the endogenous friendship formation in later years. Moreover it is not very likely that adolescents selected friends in high school according to characteristics that determined their marital behavior afterwards.

We use a panel data fixed effects estimator in order to deal with the correlated effect. Assuming that any correlation between the behavior of the peers and individual unobserved traits is due to traits that do not vary over time a panel data fixed effect estimator can deal with the correlated effect. Other studies that use a fixed effect estimator are Kuziemko (2006) and Cappellari and Tatsiramos (2011). Further robustness/falsification tests using placebo peer groups in the spirit of Fletscher (2011), and Hensvik and Nillson (2010) show that the peer effect is not due to selection.

5 Regression analysis

The benchmark regression is

$$f_{it} = \overbrace{\xi^M \overline{f_M} + \xi^C \overline{f_C}}^{\text{endogenous effects}} + \underbrace{\sum_{m=1}^{M} \beta_m x_{it}^m}_{\substack{\text{individual characteristics} \\ \text{(gender, age, race, etc)}}} + \underbrace{\frac{1}{g_i} \sum_{m=1}^{M} \sum_{j=1}^{n} \theta_m g_{ij} x_{jt}^m}_{\substack{\text{average peer characteristics} \\ \text{(contextual effects)}}} + y_t + \varepsilon_{it}$$

where f_{it} is a binary variable that takes the value 1 if an individual gets married (i.e. the individual was not married at $t-1$ and gets married at t), and 0 otherwise, $\overline{f_M}$, $\overline{f_C}$ are the percentages of married and cohabiting peers, ξ^M and ξ^C are the coefficients of interest, i.e. the peer effect that we are trying to estimate, x_{it}^m are the individual characteristics of the respondents (m variables that include gender, age, education, race, religiosity, beauty, relationship duration, out of wedlock births, mother's education, mother's age at first marriage, whether the mother was married in Wave I, and whether the mother has ever cohabited), $\frac{1}{g_i} \sum_{j=1}^{n} g_{ij} x_{jt}^m$ are the average individual and maternal characteristics of $i's$ n peers (contextual variables), i.e. the percentage of female peers, average education, percentage of African American peers, average religiosity, average beauty, average relationship duration, percentage of peers with out of wedlock births, average maternal education, average mother's age at first marriage, percentage of individuals whose mother was married in Wave I, and percentage of individuals whose mother has ever cohabited.[5] y_t are year dummies.

5.1 Wave I nominations

We first examine the determinants of the transition into first marriage using the friends nominations from Wave I. Here, we assume that friendships have lasted after high school up to Wave III (i.e. for 7 years). This assumption will be relaxed afterwards using the updated information from Wave III (only for the subsample that this information is available). Table 1 shows the descriptive statistics for a total of 2,644 respondents with non missing own and peer relationship information. Around 67% of the respondents have one friend, 14% have 2 friends, 6% have 3 friends, 5% have 4

[5] We do not include the average age of the peers, due to the very high correlation with the age of the respondent (in most cases the respondent and her friends have the same age).

friends, 3% have 5 friends and less than 3% have 6-8 friends.[6]

We start our analysis with a linear probability model (Table 2, column 1). The dependent variable takes the value 1 if someone who was not married in the previous year gets married in the current year, and the value 0 otherwise. The variables of interest are the ratio of each individual's friends that are cohabiting and the ratio of friends that are married. We include as regressors the characteristics of the individuals, such as age, gender, race, education, religiosity, and a measure of beauty (the interviewer had to assess the physical attractiveness of the respondent). All variables are explained in the appendix. We also include whether a respondent had an out-of-wedlock birth in the past as this might affect the probability of getting married. We account for maternal characteristics, such as mother's marital status at Wave I, mother's education, mother's age at first marriage and whether the mother has ever cohabited. We include the duration of the relationship which also acts as a control for being in a relationship (when someone is not in a relationship, relationship duration will be zero). All these are variables commonly used in the literature when studying the determinants of marital behavior (see Raley et al., 2007). Finally, we include year dummies in all specifications. We use the appropriate weights and robust standard errors clustered at the school level. In this specification we also include contextual variables, i.e. the average individual characteristics of the peers. The percentage of married peers has a statistically significant effect on the transition into marriage. If the percentage of married peers increases by 10% the probability of an individual getting married increases by 2.3 percentage points. The percentage of cohabiting peers does not seem to matter.

We then perform 2SLS in order to improve the identification (Table 2, column 2, see Tables A3 and A4 for the 1st stage regressions). Following the literature (Gaviria and Raphael, 2001; Powell et al., 2005) we assume that the contextual variables do not have any effect on individual behavior, i.e. $\theta_m = 0$ (indeed their effect was statistically insignificant in the OLS) and we exclude them from the regression. Instead, we use these contextual variables as an instrument for the percentage of married and

[6] In the in-school survey adolescents had nominated on average 6 friends. We consider friends that have completed the in-home interview of Wave III in order to have information about their relationship history. Given that only 15,000 out of 90,000 students participated in Wave III the number of peers is reduced substantially.

cohabiting peers.[7] The F statistic of the excluded instruments in the 1st stage is larger than 10 (18.43 for the percentage of married peers and 23.25 for the percentage of cohabiting peers) indicating that the instruments are not weak. The Hansen J statistic does not reject the hypothesis of the validity of the instruments. The effect of married peers remains statistically significant and its magnitude increases. In particular, if the percentage of married peers increases by 10% the probability of an individual getting married increases by 6.2 percentage points.

Alternatively, we perform a panel data fixed effect estimation that also can deal with the identification issues (Table 3, column 1). In this specification we include only time varying variables (age, education, out of wedlock births and the duration of the relationship). We also control for the average education and relationship duration of the peers. We cannot include parental characteristics because we have information only for Wave I (and hence no time variation). The peer effect remains significant but decreases in magnitude.

Lastly, we extend our network to the friends of friends who are not directly connected with the respondents (Table 3, column 2). The percentage of married friends of friends does not have any statistically significant effect. Hence, there is no evidence of spill-over effects between individuals that are only indirectly connected with each other.

We also perform the analysis for girls and boys separately to see whether there are any gender differences with respect to the magnitude, significance or the direction of the effect. Indeed, the peer effect on boys (Table 4, columns 3 and 4) is not statistically significant while the peer effect on girls is positive, large and statistically significant (Table 4, columns 1 and 2). This result might reflect a stigma towards unmarried females that is stronger than towards males. On the other hand, this gender difference might just reflect the fact that girls have more female friends than boys, and females get married at an earlier age than males. More specifically in our sample almost 21% of girls got married by 2002 while this percentage falls to 12% for boys. Around 56% of girls have only female friends and 45% of boys have only male friends.

[7] Alternatively we tried to use the characteristics of friends of friends who are not directly connected to the respondents but they turned out to be very weak instruments.

5.1.1 Same gender friends

One might worry that respondents nominate as friends individuals of different gender with whom they have a sexual relationship.[8] In this case, the peer effect would be spurious. Suppose that a male respondent nominates as a friend a girl with whom he has a relationship and eventually he gets married. Hence, the percentage of married peers increases and at the same time he transits into marriage. A situation like this would be mistakenly considered as peer effect although in reality the respondent and his peer had married each other. For this reason we conduct the same analysis using same-gender friends only. The results remain almost unchanged (Table 5) indicating that there should be no concern about marriages among peers.

5.1.2 Differential peer effect

But who are the ones who are influenced by their peers? Are they all the individuals or only some particular groups? In order to answer this question we analyze separately different groups of individuals with respect to religiosity and race. Marital behavior differs substantially between religious and non religious individuals, white and African Americans, hence the peer effect might also differ. Indeed, when we repeat the analysis for different groups we find that the peer effect vanishes for the non-religious ones (defined as those who have never attended religious services in the past 12 months), and it becomes stronger for the religious ones (Table 6, columns 1 and 2). Moreover, the peer effect is present only for white individuals and not for African Americans (Table 6, columns 3 and 4).

5.1.3 Cohabitation

Next, we conduct the same analysis for the transition into cohabitation (Table 7). In this case the dependent variable takes the value 1 if an individual was not cohabiting at $t-1$ and starts cohabiting at t, and is zero otherwise. Our variables of interest are again the percentages of married and cohabiting peers. On the one hand, we find no statistically significant effect of the percentage of cohabiting peers. This means that if an individual has many cohabiting peers this will not increase her probability of

[8] The survey had a separate section about "special" friends and therefore the respondents were not supposed to include them among the nominated friends.

cohabiting. On the other hand, there is a negative effect of the percentage of married peers on the decision to cohabit. We interpret this as evidence in favor of conformism with respect to marriage. If the percentage of married peers increases by 10% the probability of entering cohabitation decreases by 5.5 percentage points. Hence, having married peers acts as a deterrent to cohabitation.

5.1.4 Timing of the transition

As we discussed in the introduction, the age of first marriage has increased during the last decades. Hence, it might be the case that the timing of marriages is contagious. To study this we check whether the transition into marriage in a given year is affected from any peer who got married in the previous year or from any peer who started cohabiting in the previous year. The results in Table 8 suggest that the peer effect in the timing of marriage is significant and similar in magnitude as the peer effect in the decision to get married. Moreover, also in the case that a peer started cohabiting in the previous year the respondent's probability of getting married this year goes up (but less than if the peer got married). There is no peer effect in the timing of cohabitation (Table 9). There is evidence of a negative effect on the timing of cohabitation if some peer got married in the last year, supporting the conformistic behavior that is entailed with marriage.

5.2 Mechanism

From the analysis so far, there is evidence of a conformistic behavior with respect to marriage. However, there might be alternative underlying mechanisms, such as leisure complementarities or search externalities. A mechanism of leisure complementarities will drive individuals into marriage in order to share common interests with their married peers. The lifestyle of married people is different from the one of singles. As a result, a single individual with many married peers might decide to get married in order to be able to spend time with them doing similar activities. We use the geographical proximity of friends in order to see whether this mechanism is at work. Small geographical distance between friends facilitates communication and encourages them to enjoy leisure together. We use information on the county of residence of the peers and the respondent in Wave III (Table 10). We focus on respondents that

have both a peer that resides in the same county as them and a peer that resides in different county. This reduces the sample size. The coefficient of the percentage of same-county married friends is not statistically significant. Hence, a mechanism of leisure complementarities does not seem to drive the peer effect on marriage.

The alternative mechanism of search externalities would induce people into marriage through competition on available partners. More specifically, if most of the friends of an individual are married or cohabit, the set of available partners shrinks and this might make marriage more urgent. However, we have found that the percentage of cohabiting peers does not have any significant effect. We would expect this not to be the case if search externalities were at work.[9]

5.3 Wave III nominations: current friends

Up to now we were using friendship nominations from Wave I in order to define the peer group of the respondents. In other words, we were assuming that friendships have lasted throughout the years until Wave III. In this section we are going to relax this assumption by updating the friendship information. As we already mentioned, for the respondents of Wave III who were in the 7th or 8th grade at Wave I, an algorithm, based on clubs and activities from previous waves, was used to select 10 names of students who also attended the same school. These respondents were then asked to identify whether or not they were currently or had been previously friends with each of the 10 listed names. We then perform the analysis by using current friends as the peer group of reference. Our sample consists of 1,065 respondents who identified at least one current friend and have non missing own and peer relationship history. Table 11 shows the descriptive statistics for these respondents.[10] To our knowledge this is the first study that uses the friendship information from Wave III of the Add Health survey. One reason for this might be the small sample size. This is not an issue in our case thanks to the retrospective panel of relationships that we have constructed.

We get larger estimates when we repeat the analysis using only the friends that the respondents have identified as current ones (Table 12, columns 1 and 2). The effect is

[9] Another possible mechanism is transmission of information about marriage or cohabitation through peers. However, the absence of spill-over effects from friends of friends (Table 3, column 2) suggests that such a mechanism is unlikely to be at work.

[10] These respondents belonged to the youngest cohort of Wave I, this is why their average age and the % married is lower than those of all the respondents.

almost double in magnitude (0.057 compared to 0.031 in the fixed effects estimation and 0.133 compared to 0.062 in the 2SLS). This is not surprising given that current friends are expected to exert bigger influence than the whole set of high school friends that contains both current and former friends. There is no evidence of spill-over effects from current friends of current friends either (Table 12, column 3). The results in Table 13 regarding the transition into cohabitation provide us with a further confirmation of the conformistic mechanism based on the big negative effect of current married peers.

6 Robustness

At this point one may think that it is natural to find a positive correlation among individuals that went to the same school and share many common characteristics and thus may doubt about the causality of the peer effect. In order to convince the reader, we perform robustness checks using different groups of peers, namely ghost and placebo friends. The idea behind it is that if the peer effect is spurious it must show up also when considering as peer group of reference individuals with similar characteristics as the real friends who nevertheless are not connected to the respondents.

6.1 Ghost friends

The first robustness check uses "ghost" friends as the peer group of reference. We define ghost friends as follows. There are respondents who indicated that they had been previously friends (but not anymore) with some of the 10 names that they were provided with in Wave III. Moreover, we have information on the exact year that the respondent last saw the former friend in person, talked with her on the telephone, or exchanged email. We can thus consider the effect of ghost friends, i.e. the effect of former friends in the years *after* the friendship has ended. We expect that ghost friends should not have any effect on the decisions of the individuals. However, there might be concerns regarding the reasons that the friendship has ended.[11] If the friendship has ended due to the fact that former friends got married, ghost friends would not be adequate for our robustness check. In Table 13 we display the descriptive statistics

[11] There is a question about the reason why the friendship ended and the most common answer is "it just happened/you drifted apart" among the alternatives: the friend moved away, you moved away, the friend changed, you changed, the friend died.

of ghost friends in comparison with the ones of current friends. We do not observe a bigger tendency towards marriage for ghost friends compared to current friends. This alleviates our concerns.

We perform the same analysis using ghost friends instead of current friends. As we were expecting the percentage of married ghost friends does not have any significant effect on the transition of individuals into marriage (Table 14). This robustness check is supportive of a causal interpretation of the effect of real friends.

6.2 Placebo friends

A further robustness check consists of using placebo friends as the peer group of reference. Remember that in Wave III an algorithm, based on clubs and activities from previous waves, was used to select 10 names of students who also attended the same school. In certain cases the respondents indicated that they did not know some of the 10 names. The unidentified names correspond to individuals that could have been potentially friends with the respondent given that the 10 names were not random, but the algorithm selected them among students of the same school who were doing similar activities with the respondent. Thus, we can exploit this feature of the algorithm and define these unidentified individuals as placebo friends. Table 15 demonstrates that the characteristics of placebo and real friends are similar. Not surprisingly, when we perform the robustness check placebo friends do not have any significant effect either (Table 16). It is thus actual peers, and not just students from the same school that do matter for the decisions of the respondents.

6.3 Friends that enter into marriage/cohabitation the year after

The last robustness check concerns the timing of the transition into marriage. As we saw in Table 8, if any peer got married in the previous year, this would affect the transition of the respondent into marriage in the current year. However, we expect that if any peer gets married next year, this will not have any effect on the transition of the respondent into marriage in the current year. Indeed, this is the case as Table 17 shows. Hence, the timing of marriage is indeed contagious.

7 Conclusions

The analysis shows a positive and significant peer effect on the transition of singles into marriage. Increasing the proportion of married peers by 10% leads to an increase in individual's propensity to get married on the order of 0.3-1.3 percentage points. The effect is present for girls, religious and white people. The fact that there is no significant effect of ghost and placebo friends indicates that real peers do matter. There does not seem to exist a peer effect on the transition into cohabitation. Instead, there is a negative effect of the percentage of married peers on the respondents' transition into cohabitation. This is an indication of a conformistic behavior with respect to marriage. There is no evidence of leisure complementarities or search externalities. The social multiplier has to be taken into account when analyzing the effect of family-friendly policies, tax reforms, divorce laws or other policies that may affect the incentives to get married.

8 References

Adamopoulou, E. (2010). "Will You "Quasi-marry" Me? The Rise of Cohabitation and Decline of Marriages", *Economics Working Papers 1026*, Universidad Carlos III.

Becker, G. (1993). "*Treatise on the Family*", Harvard University Press.

Billari, F., B. Aparicio Diaz, T. Fent, and A. Prskawetz (2007). "The "Wedding-Ring", *Demographic Research*, Vol. 17, 59-82.

Blume, L., W. Brock, S. Durlauf, and Y. Ioannides (2011). "Identification of Social Interactions", *Handbook of Social Economics*, Vol. 1B, 853-964.

Boucher, V., Y. Bramoullé, H. Djebbari, and B. Fortin (2010). "Do Peers Affect Student Achievement? Evidence from Canada Using Group Size Variation", *IZA Discussion Paper.*

Bramoullé, Y., H. Djebbari, and B. Fortin. (2009). "Indentification of Peer Effects Through Social Networks", *Journal of Econometrics* Vol. 150, 41–55.

Bumpass, L., and H. Lu (2000). "Trends in Cohabitation and Implications for Children's Family Contexts in the US", Population Studies, Vol. 54, 29-41.

Calvó-Armengol, A., and Jackson M.O. (2004). "The Effects of Social Networks on Employment and Inequality", *American Economic Review*, Vol. 94, 426–454.

Calvó-Armengol, A., E. Patacchini, and Y. Zenou. (2009). "Peer Effects and Social Networks in Education", *Review of Economic Studies* , Vol. 76, 1239–1267.

Cappellari, L., and K. Tatsiramos (2011). "Friends' Networks and Job Finding Rates", *Mimeo.*

Ciliberto, F., A. Miller, H. Nielsen, and M. Simonsen (2010). Playing the Fertility Game at Work, *Mimeo.*

Clark, A., and Y. Lohéac (2007). "It Wasn't Me, It Was Them! Social Influence in Risky Behavior by Adolescents", *Journal of Health Economics*, Vol. 26, 763-784.

Cohen-Cole, E., and J. Fletcher (2008). "Is Obesity Contagious? Social Networks vs. Environmental Factors in the Obesity Epidemic," *Journal of Health Economics*, Vol. 27, 1382-1387.

De Giorgi, G., M. Pellizzari, and S. Redaelli (2010). "Identification of Social Interactions through Partially Overlapping Peer Groups", *American Economic Journal: Applied Economics*, Vol. 2, 241-275.

Drewianka, S. (1999). "Social Effects in Marriage Markets: Theory, Existence, Magnidute and Nature", *PhD Dissertation,* University of Chicago.

Drewianka, S. (2003). "Estimating Social Effects in Matching Markets: Externalities in Spousal Search", *Review of Economics and Statistics*, Vol. 85, 409-423.

Falk, A., and A. Ichino (2006). "Clean Evidence on Peer Effects", *Journal of Labor Economics*, Vol. 24, 39-58.

Fletcher, J. (2010). "Social Interactions and Smoking: Evidence Using Multiple Student Cohorts, Instrumental Variables, and School Fixed Effects," *Health Economics*, Vol. 19, 466-484.

Fletcher, J. (2011). "Peer Influences on Adolescent Alcohol Consumption: Evidence Using an Instrumental Variables/Fixed Effect Approach", *Journal of Population Economics*, forthcoming.

Gaviria, A., and S. Raphael. (2001) "School-Based Peer Effects and Juvenile Behavior", *Review of Economics and Statistics*, Vol. 83, 257-268.

Greenwood, J., and N. Guner (2009). "Marriage and Divorce since World War II: Analyzing the Role of Technological Progress on the Formation of Households", NBER Macroeconomics Annual 2008, Vol. 23, 231-276.

Glaeser, E., B. Sacerdore, and J. Scheinkman (1996). "Crime and Social Interactions", *Quarterly Journal of Economics*, Vol. 111, 507-548.

Hensvik L., and P. Nillson (2010). "Businesses, Buddies, and Babies: Social Ties and Fertility at Work", *IFAU Working Paper.*

Jackson, M. (2008). *Social and Economic Networks*, Princeton University Press.

Hoxby, C. (2000). "Peer Effects in the Classroom: Learning from Gender and Race Variation", *NBER Working Paper* No 7867.

Kalmjin, M. (2007). "Explaining Cross-National Differences in Marriage, Cohabitation, and Divorce in Europe, 1990-2000", Population Studies, Vol 61, 243-263.

Kuziemko I. (2006). "Is Having Babies Contagious? Estimating Fertility Peer Effects Between Siblings", *Mimeo,* Harvard University.

Leturcq, M. (2009). "Would you civil union me ? Civil Unions and taxes in France : Did the reform of income taxation raise the rate of civil unions ?" *PSE Working Paper* 2009 - 17.

Manski, C. F. (1993). "Identification of Endogenous Effects: The Reflection Problem", *Review of Economic Studies*, Vol. 60, 531-542.

McDermott, R., J. Folwer, and N. Christakis. (2009). "Breaking Up is Hard to Do, Unless Everyone Else is Doing it Too: Social Networks Effects on Divorce in a Longitudinal Sample Followed for 32 Years", *SSRN Working Paper.*

Patacchini E., and Y. Zenou (forthcoming). "Juvenile Delinquency and Conformism", *Journal of Law, Economics, and Organization*, forthcoming.

Powell L., J. Tauras, and H. Ross (2005). "The Importance of Peer Effects, Cigarette Prices and Tobacco Control Policies for Youth Smoking Behavior", *Journal of Health Economics*, Vol. 24, 950-968.

Raley, R., and C. Muller (2007). "Of Sex and Romance: Late Adolescent Relationships and Young Adult Union Formation", *Journal of Marriage and Family*, Vol. 69, 1210-1226.

Sacerdote, B. (2001). "Peer Effects with Random Assignment", *Quarterly Journal of Economics*, Vol. 116 (2), 681-704.

Xie, Y., J. Raymo, K. Goyette, and A. Thornton (2003). "Economic Potential and Entry into Marriage and Cohabitation", *Demography*, Vol. 40, 351-367.

Table 1. Individual characteristics in 2002[1,2] (Wave I nominations)

Characteristic	
% females	55.27
Mean Age	22.42
% cohabiting	19.24
% married	16.94
% African American	10.57
% with >high school education	61.09
Mean Religiosity (7-category scale)	1.95
Mean Beauty (5-category scale)	3.57

[1] Individuals with non missing own and peers' relationship history

[2] Corrected for survey design

Table 2. Determinants of transition into marriage (Pooled OLS and 2SLS)

	(1)	(2)
Specification	Pooled OLS	2SLS
Definition of Peers	Nominated friends	Nominated friends
% married peers	0.023**	0.062**
	(0.011)	(0.030)
% cohabiting peers	0.004	-0.051
	(0.065)	(0.045)
Individual characteristics	Yes	Yes
Parental characteristics	Yes	Yes
Contextual characteristics	Yes	Used as instruments
No of person-years	15,709	14,662
R^2	0.069	0.054
F-statistic 1st stage	-	18.43; 23.25
J statistic p value	-	0.6214

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used
Individual characteristics: gender, age, education, race, religiosity, beauty, relationship duration, out of wedlock births, Parental characteristics: marital status at Wave I, mother's education, age at first marriage, whether ever cohabited, Excluded instruments: peers' education, religiosity, beauty relationship dur, out of wedlock births, % females, % African Americans, % with married mothers
Year dummies included in all specifications

Table 3. Determinants of transition into marriage (Fixed effects)

	(1)	(2)
Specification	Linear Prob/FE	Linear Prob/FE
Definition of Peers	Nominated friends	Nominated friends of friends
% married peers	0.031**	0.029
	(0.013)	(0.024)
% cohabiting peers	0.009	0.000
	(0.007)	(0.012)
Individual characteristics	Yes	Yes
Parental characteristics	No	No
Contextual characteristics	Yes	Yes
No of person-years	19,629	10,364
R^2	0.053	0.052

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Individual characteristics (time varying): age, education, out of wedlock births, relationship dur.

Contextual characteristics: average education, and average relationship duration

Year dummies included in all specifications

Table 4. Girls' and boys' determinants of transition into marriage (2SLS and fixed effects)

	Girls		Boys	
	(1)	(2)	(3)	(4)
Specification	2SLS	Linear Prob/FE	2SLS	Linear Prob/FE
Definition of Peers	Nomin. friends	Nomin. friends	Nomin. friends	Nomin. friends
% married peers	0.099**	0.032*	0.039	0.029
	(0.047)	(0.017)	(0.038)	(0.022)
% cohabiting peers	-0.097	0.005	-0.028	0.015
	(0.066)	(0.011)	(0.064)	(0.010)
Individual char.	Yes	Yes	Yes	Yes
Parental char.	Yes	No	Yes	No
Contextual char.	Used as instrum.	Yes	Used as instrum.	Yes
No of person-years	7,956	10,791	6,706	8,838
R^2	0.041	0.051	0.046	0.056
F-statistic 1st stage	12.30; 11.41	-	11.33; 6.12	-
J statistic p value	0.744	-	0.574	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Control variables: see Table 2 for 2SLS specification, and Table 3 for FE specification

Table 5. Determinants of transition into marriage (same gender friends)

	(1)	(2)
Specification	2SLS	Linear Prob/FE
Definition of Peers	Same gender friends	Same gender friends
% married peers	0.060*	0.031**
	(0.033)	(0.015)
% cohabiting peers	-0.006	0.008
	(0.042)	(0.009)
Individual char.	Yes	Yes
Parental char.	Yes	No
Contextual char.	Used as instruments	Yes
No of person-years	11,324	15,281
R^2	0.055	0.053
F-statistic 1st stage	18.94; 16.75	-
J statistic	0.666	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level)

Control variables: see Table 2 for 2SLS specification, and Table 3 for FE specification

Table 6. Determinants of transition into marriage by characteristic

	(1)	(2)	(3)	(4)
Specification	Linear Prob/FE	Linear Prob/FE	Linear Prob/FE	Linear Prob/FE
Definition of Peers	Religious	Non-religious	White	African American
% married peers	0.037***	0.019	0.024*	0.052
	(0.013)	(0.023)	(0.013)	(0.032)
% cohabiting peers	0.010	0.010	0.008	0.014
	(0.008)	(0.013)	(0.008)	(0.014)
Individual char.	Yes	Yes	Yes	Yes
Parental char.	No	No	No	No
Contextual char.	Yes	Yes	Yes	Yes
No of person-years	14,634	4,995	16,474	3,118
R^2	0.058	0.045	0.061	0.030

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Individual characteristics (time varying): age, education, out of wedlock births, relationship dur.

Contextual characteristics: average education, and average relationship duration

Year dummies included in all specifications

Table 7. Determinants of transition into cohabitation (2SLS and fixed effects)

	(1)	(2)
Specification	2SLS	Linear Prob/FE
Definition of Peers	Nominated friends	Nominated friends
% married peers	-0.055*	-0.003
	(0.031)	(0.018)
% cohabiting peers	0.076	0.005
	(0.049)	(0.013)
Individual char.	Yes	Yes
Parental char.	Yes	No
Contextual char.	Used as instruments	Yes
No of person-years	14,408	19,783
R^2	0.029	0.020
F-statistic 1st stage	19.53; 18.86	-
J statistic	0.717	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used
Variables in the FE specification: age, education, rel. duration, peers' average education, rel. duration
Variables in the 2SLS specification: age, race, gender, education, relationship dur, religiosity, beauty, all parental characteristics, Excluded instruments: peers' education, religiosity, beauty, rel. duration, out of wedlock births, % females, % African Americans, % with ever cohabiting mother.
Year dummies in all specifications

Table 8. Determinants of the timing of the transition into marriage (Fixed effects)

	(1)
Specification	Linear Prob/FE
Definition of Peers	Nominated friends
Any peer entered marriage in the previous year	0.032*
	(0.017)
Any peer entered cohabitation in the previous year	0.013*
	(0.007)
Individual characteristics	Yes
Parental characteristics	No
Contextual characteristics	Yes
No of person-years	17,009
R^2	0.048

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Control variables: see Table 3

Table 9. Determinants of the timing of the transition into cohabitation (Fixed effects)

	(1)
Specification	Linear Prob/FE
Definition of Peers	Nominated friends
Any peer entered marriage in the previous year	-0.017*
	(0.010)
Any peer entered cohabitation in the previous year	0.0003
	(0.012)
Individual characteristics	Yes
Parental characteristics	No
Contextual characteristics	Yes
No of person-years	17,170
R^2	0.015

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Control variables: see Table 3

Table 10. Transition into marriage and geographical proximity

	(1)
Specification	Linear Prob/FE
Definition of Peers	Nominated friends
% married peers	0.122**
	(0.046)
% same county married peers	-0.005
	(0.034)
% cohabiting peers	0.043
	(0.040)
% same county cohabiting peers	-0.005
	(0.018)
Individual characteristics	Yes
Parental characteristics	No
Contextual characteristics	Yes
No of person-years	3,352
R^2	0.064

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Control variables: see Table 3

Table 11. Individual characteristics in 2002[1,2] (Wave III nominations)

Characteristic	
% females	49.37
Mean Age	20.61
% cohabiting	19.20
% married	7.27
% African American	12.71
% with >high school education	50.43
Mean Religiosity (7-category scale)	2.19
Mean Beauty (5-category scale)	3.56

[1] Individuals with non missing own and peers' relationship history

[2] Corrected for survey design

Table 12. Determinants of transition into marriage (current friends)

	(1)	(2)	(3)
Specification	2SLS	Linear Prob/FE	Linear Prob/FE
Definition of Peers	Current friends	Current friends	Current friends of friends
% married peers	0.133**	0.057*	0.058
	(0.053)	(0.029)	(0.040)
% cohabiting peers	-0.043	0.013	0.017
	(0.034)	(0.013)	(0.014)
Individual char.	Yes	Yes	Yes
Parental char.	Yes	No	No
Contextual char.	Used as instruments	Yes	Yes
No of person-years	6,637	8,252	2,980
R^2	0.012	0.031	0.021
F-statistic 1st stage	4.95; 10.53	-	-
J statistic	0.897	-	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level)

Control variables: see Table 2 for 2SLS specification, and Table 3 for FE specification

Table 13. Determinants of transition into cohabitation (current friends)

	(1)	(2)
Specification	2SLS	Linear Prob/FE
Definition of Peers	Current friends	Current friends
% married peers	-0.171*	-0.056**
	(0.099)	(0.021)
% cohabiting peers	0.016	0.001
	(0.063)	(0.025)
Individual char.	Yes	Yes
Parental char.	Yes	No
Contextual char.	Used as instruments	Yes
No of person-years	6,501	8,081
R^2	0.058	0.041
F-statistic 1st stage	5.45; 8.16	-
J statistic	0.555	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level)

Control variables: see Table 7

Table 14. Real vs ghost friends' characteristics in 2002[1,2]

Characteristic	Real friends	Ghost friends
% married	7.27	8.47
% cohabiting	19.20	20.66
% females	49.37	60.22
Mean Age	20.61	20.63
% African American	12.71	15.07
% with > high school education	50.43	54.18
Religiosity (5-category scale)	2.19	2.06
Beauty (5-category scale)	3.56	3.61

[1] Individuals with non missing relationship history

[2] Corrected for survey design

Table 15. Determinants of transition into marriage (ghost friends)

	(1)	(2)
Specification	2SLS	Linear Prob/FE
Definition of Peers	Ghost friends	Ghost friends
% married peers	-0.057	0.035
	(0.102)	(0.029)
% cohabiting peers	0.054	-0.006
	(0.071)	(0.014)
Individual char.	Yes	Yes
Parental char.	Yes	No
Contextual char.	Used as instruments	Yes
No of person-years	2,897	3,452
R^2	0.067	0.043
F-statistic 1st stage	4.05; 11.07	-
J statistic	0.914	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level)

Control variables: see Table 7

Table 16. Real vs placebo friends' characteristics in 2002[1,2]

Characteristic	Real friends	Placebo friends
% married	7.27	9.71
% cohabiting	19.20	21.16
% females	49.37	60.53
Mean Age	20.61	20.72
% African American	12.71	19.49
% with > high school education	50.43	47.27
Religiosity (5-category scale)	2.19	2.09
Beauty (5-category scale)	3.56	3.55

[1] Individuals with non missing relationship history

[2] Corrected for survey design

Table 17. Determinants of transition into marriage (placebo friends)

	(1)	(2)
Specification	2SLS	Linear Prob/FE
Definition of Peers	Placebo friends	Placebo friends
% married peers	0.024	0.002
	(0.066)	(0.021)
% cohabiting peers	0.008	0.015
	(0.507)	(0.014)
Individual char.	Yes	Yes
Parental char.	Yes	No
Contextual char.	Used as instruments	Yes
No of person-years	5,638	7,066
R^2	0.044	0.028
F-statistic 1st stage	5.61; 16.23	-
J statistic	0.652	-

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level)

Control variables: see Table 7

Table 18. Determinants of the timing of the transition into marriage (Robustness)

	(1)
Specification	Linear Prob/FE
Definition of Peers	Nominated friends
Any peer enters marriage in the year after	0.012
	(0.012)
Any peer enters cohabitation in the year after	-0.004
	(0.006)
Individual characteristics	Yes
Parental characteristics	No
Contextual characteristics	Yes
No of person-years	17,498
R^2	0.065

*** p<0.01, ** p<0.05, * p<0.1 (robust s.e. clustered at school level), cross sectional weights used

Control variables: see Table 3

8.1 Appendix

Table A1. Sample's characteristics in 2002[1]

Characteristic	All individuals[2]	Sample[3]
% married	17.67	16.94
% cohabiting	21.77	19.24
% females	51.40	55.26
Mean Age	22.59	22.41
% African American	15.04	10.56
% with > high school education	53.05	61.09
Religiosity (5-category scale)	1.92	1.96
Beauty (5-category scale)	3.51	3.58
N	10,220	2,644

[1] Corrected for survey design

[2] Individuals with non missing own relationship history

[3] Individuals with non missing own and friends' relationship history

Table A2. Definition of Variables

Variable	Type	Values
Gender	binary	0 if male 1 if female
Age	continuous	[18, 28]
Race	binary	0 if not African American 1 if African American
Education	binary	0 if high school or less 1 if more than high school
Religiosity (Attendance in religious services)	ordinal	0 never 1 a few times 2 several times 3 once a month 4 two or three times a month 5 once a week 6 more than once a week
Beauty	ordinal	1 very unattractive 2 unattractive 3 about average 4 attractive 5 very attractive
Parental marital status	binary	0 if parents were married in wave I 1 otherwise

Mother's education	binary	$\begin{cases} 0 \text{ if high school or less} \\ 1 \text{ if more than high school} \end{cases}$
Mother's age at first marriage	continuous	[13, 53]
Mother ever cohabited	binary	$\begin{cases} 1 \text{ if the mother has ever cohabited} \\ 0 \text{ otherwise} \end{cases}$
Out of wedlock births	binary	$\begin{cases} 1 \text{ if birth before the 9th month of marriage} \\ 0 \text{ otherwise} \end{cases}$
Relationship duration	continuous	in years (=0 if not currently in a relationship)
Contextual		average of all characteristics

Table A3. IV-Auxilliary Equation

Instrumented: % married peers		
	Coefficient	Std. Error
Gender	-0.0041	0.0109
Age	0.0126***	0.0035
Race	0.0072	0.0438
Education	-0.0013	0.0138
Religiosity	0.0026	0.0035
Beauty	-0.0028	0.0045
Mother married at wave I	-0.0205*	0.0114
Mother's age at first marriage	-0.0035***	0.0010
Mother's education	0.0088	0.0076
Mother ever cohabited	0.0234	0.0156
Out of wedlock birth	0.0025	0.0218
Relationship duration	-0.0016	0.0029
y1995	0.0670**	0.0269
y1996	0.0466**	0.0248
y1997	0.0332	0.0234
y1998	0.0236	0.0211
y1999	0.0282*	0.0163
y2000	0.0247**	0.0104
y2001	0.0283***	0.0060
% female peers	0.0124	0.0125
% African American peers	-0.0871**	0.0428
average rel. duration	0.0465***	0.0060
% peers with out of wed birth	0.2386***	0.0364
% peers with married mother	-0.0233	0.0175
average education	-0.0419*	0.0214
average religiosity	0.0151***	0.0041
average beauty	-0.0150*	0.0082

No of person-years	14,662
R^2	0.278

*** p<0.001, **p<0.05, *p<0.10, rob s.e. clustered at school level

Cross sectional weights used

F test of excluded instruments: F(8,125)=18.43, Prob>F=0.000

Table A4. IV-Auxilliary Equation

Instrumented: % cohabiting peers		
	Coefficient	Std. Error
Gender	-0.0056	0.0101
Age	0.0114***	0.0036
Race	-0.0579**	0.0259
Education	-0.0202*	0.0119
Religiosity	-0.0020	0.0025
Beauty	0.0126**	0.0052
Mother married at wave I	0.0328**	0.0164
Mother's age at first marriage	-0.0010	0.0012
Mother's education	-0.0118	0.0079
Mother ever cohabited	-0.0280	0.0188
Out of wedlock birth	0.0025	0.0230
Relationship duration	0.0038	0.0038
y1995	-0.0179	0.0257
y1996	-0.0092	0.0247
y1997	-0.0022	0.0238
y1998	-0.0009	0.0224
y1999	0.0125	0.0208
y2000	0.0054	0.0153
y2001	0.0144**	0.0068
% female peers	0.0149	0.0121
% African American peers	0.0354	0.0284
average rel. duration	0.0299***	0.0046
% peers with out of wed birth	0.1150***	0.0382
% peers with married mother	0.0263*	0.0151
average education	-0.0364**	0.0141
average religiosity	-0.0142***	0.0023
average beauty	-0.0127	0.0078

No of person-years	14,662
R^2	0.139

*** p<0.001, **p<0.05, *p<0.10, rob s.e. clustered at school level

Cross sectional weights used

F test of excluded instruments: F(8,125)=23.25, Prob>F=0.000