Disentangling Subjective Norms:
The Social Effects of Friends and Parents on Unintended Young Pregnancy

Extended Abstract for PAA Submission

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(preliminary results: please do not cite or quote without permission)

Abstract

This paper examines the role of perceived norms in predicting unintended pregnancy rates among young women. Working within the theory of planned behavior framework, I first assess the relationship between fertility-related subjective norms and unintended early pregnancy, with particular interest in *whose* – friends' or parents' – and what *type* – attitudes or behaviors - of norms best predict pregnancy. Second, I explore how these effects vary by parity, testing models on the hazard of first, second, and third parity pregnancies. I find that various fertility-related perceived norms predict pregnancy, and that these effects vary by parity. Particularly strong predictors include perceptions of friends' approval on first pregnancies; perceptions of friends' behavior on second pregnancies; and a combination of friends' and parents' approval and behaviors on third pregnancies. Findings from this study shed important light on how a young adult understands or perceives her social reality and how these perceptions of what is "normal" or "right" amongst family and friends influence pregnancy outcomes.

INTRODUCTION

Pregnancy rates among teenagers and young women in the United States increased from the early 1970s to the early 1990s by roughly 21% among women younger than 20 and 17% among women aged 20-24 (Guttmacher). Until the late 1980s, the birthrate among these women remained largely unchanged. Despite declines in pregnancy since the early 1990s, pregnancy and birthrates among teenagers and young women increased again from 2005-2006 (Guttmacher), with a further increase in the birthrate among all women in 2007 (Hamilton et al 2007). Today, the United States' teenage pregnancy rate remains among the highest among industrialized nations (Singh and Darroch 2000), with recent estimates of 39 live births per 1,000 females aged 15-19 (UN). Further, global comparisons of pregnancy rates and intention status find that North America is the only region in which overall and unintended pregnancy rates have not declined since 1995 (Singh et al 2010). It is estimated that 82% of teen pregnancies in the United States are unplanned, with teens accounting for roughly one-fifth of all unintended pregnancies annually (Santelli et al 2007). Unintended pregnancy rates vary largely by socio-demographic characteristics, with rates above average for unmarried women (particularly cohabiting women), low-income women, women who have not completed high school, and minority women (Finer and Henshaw 2006).

In trying to explain these pregnancy behavior patterns, scholars have worked within the theory of planned behavior framework proposed by Fishbein and Ajzen (1991; 2010). The framework posits that subjective norms, along with an individual's attitudes and perceived control, regarding a specific behavior influence an individual's behavioral *intentions*, which then, in turn, determine the probability of actually performing the behavior of interest. In contrast to individual attitudes and perceived control, subjective norms emphasize the social environment in which an individual making a decision is embedded, capturing their understanding of what others think they should or should not do concerning the behavior of interest. In determining the behavioral intention, the perceived norm is ultimately weighted by the value the individual assigns the referent, or source of the norm.

Young adults frequently face novel situations in which they are uncertain of the consequences of their decisions. Two salient social actors from whom they draw normative ideas to inform their decisions are parents and friends (Udry 1993). Evidence suggests that parents' own preferences and behaviors influence children's family formation attitudes and behaviors (Barber 2000; Wu 1996; Jarret and Burton 1999; Thornton 1980; Axinn, et al 1994; Barber and Axinn 1998) through a combination of socialization and social control (Barber 2000). However, while parental influences might be important during the transition to adulthood, these effects may weaken as children age due to new socialization forces, such as peer networks. Here, teenagers both strive to conform to the behavior of their friends and learn about contraceptives and how to obtain them, while also keeping deeply ingrained parental attitudes and behaviors in mind (Montgomery and Casterline 1996). While parents and friends are predicted have strong influences on adolescent fertility, *whose* and *which* perceived norms are the best predictors of young unintended fertility remain unclear.

This study takes advantage of the Relationship Dynamics and Social Life study (RDSL), a panel study in which young women aged 18-21, an age range found to have the highest risk of unintended pregnancy, report pregnancy status, sexual behaviors, and pregnancy intentions weekly. Additionally, the young women are asked to report their perceptions of friends' and parents' attitudes and behaviors every three months. This paper contributes to the literature in three critical ways. It presents 1) a comparison of perceptions of friends' and parents' approval

of pregnancy-related behaviors (injunctive norms); and 2) a comparison of perceptions of friends' approval and friends' prevalence of pregnancy-related behaviors (injunctive and descriptive norms), providing an overall comparison of *whose* and *which type of* norms are the strongest predictors of unintended young pregnancy. Further, it presents 3) an analysis of how the effects of these perceived norms vary by parity.

Findings from this study shed light on how young women perceive their social reality and understand "what she should do" with regards to fertility-related behaviors, providing important insight into *whose* and *which* attitudes and behaviors influence young pregnancy most. Strong effects of parents' approval, for instance, suggest that young women are influenced and socialized by their parents, with actions during young adulthood motivated by what their parents think is moral or right. Conversely, strong effects of friends' approval or behavior indicate that young women act according to social pressure and what they perceive is "normal" and right amongst friends. Thus, the study provides a deeper understanding of who and what young women regard as important sources of appropriate fertility-related behavior, and how these perceived sources operate differently across pregnancies.

THEORETICAL FRAMEWORK

Models of behavior in the early 1970s consisted largely of attitudes predicting behaviors of interest. In response to weak support for these models, Fishbein and Ajzen (1975; 1980; 1991; 2010) proposed a more complex explanation for understanding behaviors. Their theory of planned behavior starts with a single behavioral domain defined by four components - action, target, context, and time – and determinants specific to that domain. It consists of three constructs that together predict behavior: attitude, subjective norm, and control. Coupled with attitudes and perceived control, subjective norms shape a person's intention to perform a behavior of interest, the strength of which, in turn, influences the probability the individual will perform the behavior.

Subjective norms: referents and types

Subjective norms consider the influence of others in a person's social environment. They weight a person's own understanding of relevant others' beliefs or expectations of a particular behavior by the importance the person ascribes to the others' opinions. In other words, subjective norms capture an individual's understanding of what others think they should or should not do concerning the behavior of interest (Fishbein and Ajzen 1975; 2010). Both the person's own attitudes and subjective norms influence his or her *behavioral intention*, or *readiness to perform the behavior*, which has been found to predict behavioral outcomes. The theory of planned behavior argues that the stronger the perceived social pressure towards the specific behavior, the greater the probability the person will intend to perform the behavior. The predictive power of subjective norms vary based on 1) *referent*, the source of the perceived norm, and 2) *type*, whether the norm captures the referent's perceived approval or perceived behaviors.

First, compliance with perceived social pressure can work through many ways, including *referent power*, which suggests that a person behaves in accordance with a social agent of interest in an effort to be like the agent (Fishbein and Ajzen 2010). These normative beliefs, coupled with a person's motivation to comply with the salient referent, determine the prevailing subjective norm. Thus, a person who perceives that an important referent, such as a parent or close friend, holds a specific behavior in positive light will tend to have stronger intentions to perform that behavior. Second, the *type* of subjective norm might also have different effects on a

person's intention and thus probability of performing a behavior. Fishbein and Ajzen (2010) disentangle normative prescriptions to encompass perceptions of both 1) what other individuals or groups think one should or should not do regarding a particular behavior (*injunctive norms*) and 2) whether important others are performing or not performing the particular behavior themselves (*descriptive norms*). In this case, young adult women might perceive their friends to be supportive of using birth control, but whether they perceive their friends to actually be using birth control might be more influential.

An important distinction exists between the sociological definition of social norms and the psychological definition, which is generally incorporated into the TPB models. Most Sociologists define social norms as shared individual values at a cultural level (Gibbs 1965; Thornton et al 2001). Because they exist at a societal level, norms are social in nature, reflecting cultural or societal solutions to individual-level problems (Thornton et al 2001:220). Thus, while individuals might have some role in social change or choosing among competing norms, sociological analyses tend to treat norms as larger structures governing individuals and their behaviors through a shared understanding of a group's preferred behaviors and what group members "ought" to do. In contrast, social psychologists tend to understand social norms and within smaller social group units, such as a work team or close group of friends. They focus on how group norms influence an individual's self or identity, with particular interest in behavioral outcomes related to conformity. In this sense, the perceived norms included in Fishbein and Ajzen's models are not as strong as sociological explanations based on larger structures of social order and control. Rather, they aim to explain behavioral outcomes based on adherence to social group norms at the individual-level, and thus capture perceptions in the head of the individual.

Influence of parents and friends

The theory of planned behavior approach argues that parents and friends influence fertility through perceived norms. These norms shape an individual's understanding of what should or should not be done regarding a behavior of interest through one's perceptions of important social actors' approval and own behaviors. While little has been done to test these combined effects on fertility, existing evidence supports the assertion that parents and friends influence what individuals do. In this vein, how young adult perceive these social actors' attitudes and behavior will have an important impact on their own fertility behaviors.

Intergenerational effects of parents on fertility attitudes and behaviors

Scholars have long researched parental influence on children's fertility, with an early study suggesting a robust and positive association between the number of children parents have and the number of children these children have themselves. Duncan et al hypothesized that the similarities in intergenerational behavior occur because the social interaction children experience with family members is so profound, that they in turn seek to recreate a setting similar to that of their families of origin (1965: 514). In addition to family size, scholars have focused on other structural characteristics and behaviors of the parental family that influence children's general social opportunities and subsequent family formation decisions, including parental divorce, income and stability, education, and labor force participation (Wu 1996; Jarret and Burton 1999).

Outside of parental experiences and structural factors, findings suggest an ideational component to intergenerational transmission between parents and their children. Specifically, scholars have found that parents' *preferences* for both themselves and their children, separate from their behaviors, influence children's family size expectations (Thornton 1980; Axinn, et al 1994; Barber and Axinn 1998). Additionally, Barber argues that parental values, beliefs, and

attitudes expressed in a child's household of origin have significant effects on family formation (2000). Findings further suggest that mothers' attitudes supporting fertility behaviors have similar effects as attitudes *not* supporting behaviors operating in opposite domains (i.e., educational and career aspirations). Similarly, perceived parental attitudes on children leaving home influence the residential behaviors of young adults (Billari and Liefbroer 2007).

Network or peer effects on fertility attitudes and behaviors

In addition to parental influences, scholars have investigated the effects of peer networks on behavioral outcomes. In explaining breastfeeding behaviors, for example, studies find that an individual's personal beliefs and others' opinions influence feeding intentions among low-income women (Hill et al 2008). A second study found that partners', nurses' and midwives' views are an important influence on decisions to breastfeed or bottle-feed, suggesting that discontinuers perceived more overall social pressure to bottle-feed (Swanson and Power 2004). In examining condom use among young men of female sex workers, Barrington, et al focused on the importance of social networks (2009). Focusing on perceived condom use by their male social network members and self-reported encouragement to use condoms from social network members, findings indicate that condoms were used more consistently among men who perceived that some or all of their male social network members used condoms consistently. This in turn was significantly associated with encouragement to use condoms from social network members. Additional studies also suggest the importance of group attitudes in predicting intentions to practice HIV-preventative behaviors (White et al 1994).

Social effects of parents and friends

While both parents and friends are predicted to influence young pregnancy, they are expected to do so through different mechanisms. Montgomery and Casterline argue that fertility-related ideas are diffused through social effects, which consist of two components: social learning and social influence (1996:152). Social learning can be thought of as the provision of information that shapes an individual's subjective beliefs about various elements of a behavior of interest. This can work through both interpersonal (other actors) or impersonal channels (mass media, markets, or other aggregate social structures (1996:154-155). For example, while young women navigate the uncertainties of young adulthood, it is common to look to peers for information on contraception access and options and "learn" appropriate sexual behaviors. Social influence, on the other hand, draws on the primary human motivation to avoid conflict within social groups, resulting in a sort of conforming of individual's attitudes and behaviors to those of other group members so as to avoid various undesirable effects. One form of social influence considers authority and power, which can be thought of as a specific type of social conformity due to a marked hierarchy in the social relationship, such as between parents and children.

Conceptualizing social effects on fertility thus consists of two pieces. The first works within Fishbein and Ajzen's theory of planned behavior framework, which argues that subjective norms influence an individual's intentions to perform a behavior of interest, which in turn determines the probability they will actually engage in the behavior. These norms can be further teased apart by referent (the source of the perceived norm) and type (*injunctive* – perceptions of what others think they should or should not do – and *descriptive* – perceptions of what others are actually doing). While the model predicts the effects of perceived norms on fertility, it does little to explain *why* certain referents or types of norms might have the strongest influence. The second piece, social learning and social influence, explains *whose* and *which* norms are most influential. I expect perceptions of friends' attitudes and behavior regarding sex and contraceptive use to

influence their pregnancy outcomes more than parents', due to young adults' tendency to obtain information on sexual behavior from their peers. I expect these effects to weaken for higher parity pregnancies, which might depend more on perceived parental support than perceptions of what friends think or do. Along these lines, I expect friends to have more influence on young adults' fertility behaviors at lower parity pregnancies and parents to have a stronger effect at higher parity pregnancies.

Social actors often influence an individual's behaviors through the individual's own desires and expectations to perform the behavior. I include models that test whether respondents' pregnancy desires and expectations mediate the effects of perceived norms. If the effects of perceived norms remain significant, it would suggest that perceived norms influence unintended pregnancy independent of young women's own pregnancy desires and expectations. Such findings would shed light on the strong effects of salient social actors in young women's lives, highlighting *whose* and *which* attitudes and behaviors shape pregnancy behaviors.

DATA AND METHOD

Sample

Data are taken from the Relationship Dynamics and Social Life Survey. The sample consists of women residing in a Michigan county ages 18-21, an age range found to have the highest risk of unintended pregnancy. A baseline interview assessed characteristics of family background, including demographic information; attitudes, perceived norms, values and beliefs; current and past romantic relationships; education; and career plans. After the baseline, respondents were invited to participate in a weekly, mixed mode (internet and phone) survey for approximately 2.5 years, or 130 weeks. Ninety-nine percent of the 1,003 respondents who completed the baseline interview enrolled in the weekly journal portion of the study (N=922).

The sample is restricted to women who never reported being married at any point during the study. Further, analyses are restricted to unintended pregnancies, resulting in a working sample of 889 unmarried young women and 52,474 person-weeks for all pregnancies; 661 cases and 42,481 person-weeks with no prior pregnancies; 229 cases and 6,647 person-weeks with one prior pregnancy; and 105 cases and 1962 person-weeks with two prior pregnancies.

Key measures

Unintended pregnancy

Pregnancy is measured as the report of a positive pregnancy test. Respondents were first asked whether it is possible they are pregnant. If the answer is yes, they are asked if a pregnancy test has indicated that they are pregnant. A yes is coded as "1" and a no as "0". Two time-varying measures assess *unintendedness* in asking how much the respondent *wants to get pregnant* and how much the respondent wants to *avoid getting pregnant*. Both are coded from 0-5, where 0 is not at all and 5 is very much. Respondents identified as "extremely pronatal", measured as 5 on *wants to get pregnant* and 0 on *wants to avoid getting pregnant*, were dropped.

Of note here is that these models predict unintended pregnancies that occurred *during* the study period, meaning that a respondent who entered the study with one prior pregnancy, for example, will be included in hazard models predicting second pregnancies and above (when applicable), but will not be included in models predicting first pregnancies. While models do not predict pregnancies occurring at ages younger than eighteen, they focus on a critical window of

young women's lives. Women between the ages 18-21 are experiencing major transitions toward independence and uncertainty, and are found to be at the highest risk of unintended pregnancy.

Perceived norms

Injunctive norms: Four measures assess perceptions of friends' and parents' approval of fertility-related behaviors in asking how they would react if the respondent had sex, was using birth control, had sex without birth control, and had a baby. These questions are coded from 0 to 5, where 0 is not at all positively and 5 is extremely positively.

Descriptive norms: Four measures similarly assess the prevalence of friends' pregnancy-related behaviors, including how many of the respondents' friends have had sex, are using birth control, have had sex without birth control, and are parents. They are coded from 1 to 5, where 1 is "none" and 5 is "almost all of them".

Pregnancy desires

Two time-varying measures assess respondents' pregnancy desires in asking how much they want to have intercourse in the next year and if so, how much they want to use some type of birth control. Both measures are coded from 0-5, where 0 is "not at all" and 5 is "extremely".

Pregnancy expectations

Three time-varying measures assess respondents' pregnancy expectations in asking the chances of having intercourse, the chances of having intercourse without birth control, and the chances of getting pregnant in the next year. These are coded 0-100, where 0 is "absolutely not" and 100 is "absolutely sure it will happen".

Baseline controls

Socio-demographic characteristics: I include socio-demographic variables measuring the respondent's personal information, school enrolment status, and household structure. Personal information measures include age at baseline, race, and importance of religion. School enrolment measures capture the type of schooling currently enrolled in and highest grade completed. Household structure measures include indicators for public assistance, currently living with partner, mother's age at first birth, family structure, mother's education, and parental income.

Prior sexual, contraceptive and pregnancy experiences: I also include baseline measures assessing the respondent's prior pregnancy-related experiences, including measures for early sexual and whether the respondent has had 2 or more sexual partners.

All hazard models include controls for months in study, months in study squared, and number of completed journals. Descriptive statistics of baseline control measures are included in the appendix.

Method

I test the effects of perceptions of friends' and parents' injunctive and descriptive fertility-related attitudes and behaviors on the hazard of unintended young pregnancy using event history methods. Because the data are measured weekly, I use discrete-time methods to estimate these models. Person-weeks are the unit of analysis with women considered to be exposed to the risk of pregnancy during any week that they report that they are not pregnant. Models predicting first pregnancy include only respondents with no prior pregnancies; those predicting second pregnancies include only those with one prior pregnancy; and those predicting higher parity pregnancies include respondents with two or more prior pregnancies. Measures of prior pregnancies are time-varying, allowing, for example, a respondent who entered the study with no

prior pregnancies and who reported three pregnancies during the study period to be included in all three hazard models.

Analyses use time-varying measures of pregnancy intentions, perceived norms, and respondents' pregnancy desires and expectations. These measures were collected at baseline and every three months and are lagged three weeks prior to the current weekly measure of pregnancy status. Lagging these measures captures estimated effects prior to the sexual intercourse that resulted in the pregnancy, attempting to sidestep any effects stemming from reverse causation. This strategy does not entirely avoid the reciprocal causation problem, however, as sexual behavior might influence young women's attitudes.

PRELIMINARY RESULTS

Descriptive statistics presented in Table 1 suggest that young women perceive their friends to have more positive attitudes than parents toward sex, sex without birth control, and having a baby across all pregnancy parities, and their parents to have more positive attitudes toward using birth control for those respondents with one and two prior pregnancies. Regarding specific attitudes, they perceive their friends and parents to have the highest approval of using birth control, followed by having a baby, having sex, and, lastly, having sex without birth control. Of the four fertility-related behaviors, respondents perceive their friends to be having sex the most, followed by using birth control, having sex without birth control, and then being parents. Further, respondents' perceptions of approval increase (perceive others to approve more) across pregnancy parity for all perception measures, with perceptions of parents' approval of using birth control and friends' usage of birth control decreasing only slightly.

With each pregnancy, pregnancy desires and expectations become more pronatal, with desire to have intercourse over the next year increasing and desire to use birth control decreasing with parity. Similarly, expectations of the likelihood of sex, sex without birth control, and to get pregnant all increase with parity, with only a slight decrease in the latter measure for those respondents with two prior pregnancies.

Preliminary logistic regression results presented in Table 2 suggest that the perceived norms significantly predicting pregnancy vary with parity. For respondents with no prior pregnancies (Model 1), findings suggest that perceptions of friends' approval of having sex has a *negative* effect and their approval of having a baby has a *positive* influence pregnancy, while no other perceived norms of parents' approval or friends' approval or behaviors have a significant effect. In other words, the more respondents perceive their friends to respond positively to having sex, the *less likely* they are to report a positive pregnancy, and the more their friends respond positively to having a baby, the *more likely* they are to become pregnant. While the former works in the opposite direction as expected, these preliminary findings suggest that it is perceptions of *friends attitudes* that best predict first pregnancies.

In predicting second pregnancies (Model 2), perceptions of friends' approval are no longer significant, while three perceived norms of friends' behaviors are. In particular, the more respondents perceive their friends to have sex, the more likely they are to report a pregnancy. Similarly, the more young women perceive their friends to use birth control and the more prevalent women perceive their friends to be parents, the *less likely* they are to get pregnant. Thus, while first pregnancies are largely predicted by what friends think, second pregnancies are strongly influenced by perceptions of what friends *are doing*.

Model 3 presents results for respondents with two prior pregnancies, suggesting that a

combination of perceived norms predict third pregnancies. Perceived norms with particularly strong effects are friends' approval of having a baby, parents' approval of using birth control, and prevalence of friends using birth control. Prevalence of friends using birth control works in the expected direction, with the more friends that are perceived to use it predicting a lower rate of pregnancy, similar to second pregnancies. However, perceptions of friends' approval of having a baby and parents' approval of using birth control work in the opposite direction as expected: the more young women perceive their friends to approve of having a baby, the *less likely* respondents are to get pregnant, and the more they perceive their parents to approve of using birth control, the *more likely* they are to get pregnant. Preliminary analyses looking deeper into these cases reveal that respondents at risk of third pregnancies are different from those at risk of first and second pregnancies, namely in that they are more likely to be African American, receiving public assistance, holding religion as important, living with a partner, and to have had sex without birth control.

Table 3 presents these same models with added measures for respondents' pregnancy desires and expectations. The majority of perceived norms found to significantly predict pregnancies in Table 2 maintain their significance, suggesting that pregnancy desires and expectations do not work as mediating effects. The only difference between these tables is that the prevalence of friends using birth control no longer predicts third pregnancies (Model 3). Overall, pregnancy desires and expectations work in the expected directions, with expectations having small effects on first and second pregnancies and desires having larger effects on third pregnancies, in part explaining away the effect of the prevalence of friends using birth control.

DISCUSSION, LIMITATIONS AND FUTURE DIRECTIONS

While results presented in this extended abstract are preliminary, they suggest strong patterns in explaining unintended young pregnancies. In particular, perceptions of what friends *think* influence first pregnancies, perceptions of what friends *do* influence second pregnancies, and a combination of perceptions of what friends and parents think and do explains third pregnancies. These findings highlight the social effects experienced by young women, with friends existing as critical sources of information on normative sexual behaviors, and parents maintaining some socializing influence, although these effects are weaker than friends'.

For PAA, I plan to run similar models using stricter measurements for *unintended pregnancies* as sensitivity analyses. I also intend to explore effects of subjective norms on higher parity pregnancies (2+ prior pregnancies), capturing all pregnancies that occurred during the study period in the analyses. Lastly, I plan to dig deeper into the differences between women across pregnancy parities. These differences might provide deeper insight into how subjective norms influence unintended young pregnancy outcomes.

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Table 1. Means and Standard Deviations of Time-Varying Perceptions of Friends' and Parents' Injunctive and Descriptive Norms and Pregnancy Desires and Expectations by Parity

Variable	**Mean**	**St Dev**	**Mean**	**St Dev**	**Mean**	**St Dev**
Perceived norms	0 prior pregnancy		1 prior pregnancy		2 prior pregnancies	
Friends injunctive (0-5)						
How would your friends react if you…						
…had sex	2.86	1.29	2.91	1.35	3.04	1.30
…were using birth control	3.86	1.28	3.97	1.40	4.00	1.32
…had sex without birth control	1.31	1.29	1.88	1.38	2.16	1.43
…had a baby	2.34	1.52	3.49	1.46	3.54	1.56
Parents injunctive (0-5)						
How would your parents react if you…						
…had sex	1.72	1.31	2.25	1.42	2.33	1.42
…were using birth control	3.38	1.62	4.08	1.31	4.05	1.33
…had sex without birth control	0.68	1.18	1.31	1.56	1.35	1.46
…had a baby	1.79	1.58	2.83	1.80	3.02	1.73
Friends descriptive (1-5)						
How many of your friends…						
…have had sex	3.99	1.16	4.49	0.93	4.62	0.89
…are using birth control	3.23	1.10	3.30	1.14	3.24	1.21
…have had sex without birth control	2.71	1.04	3.31	1.13	3.50	1.10
…are parents	2.12	0.93	2.83	1.15	3.15	1.19
Desires (0-5)						
Want to have intercourse next year	2.74	1.83	2.90	1.68	2.81	1.71
How much want to use some birth control	4.41	1.27	4.31	1.33	4.26	1.22
Expectations (0-100)						
Likelihood of sex in the next year	62.30	39.70	77.09	32.35	79.61	29.41
Likelihood of sex w/o birth control in next year	20.15	31.63	34.86	35.52	39.32	36.35
Likelihood to get pregnant in the next year	12.10	20.24	21.34	26.36	21.10	29.14

Table 2. Hazard models with Time-Varying Perceived Norms on Unintended Pregnancy by Parity

	1 0 prior	2 1 prior	3 2 prior
Perceived Norms			
Approval			
How would your friends react if you…			
…had sex	-0.19*	0.02	0.21
	(0.11)	(0.11)	(0.25)
…were using birth control	0.08	-0.12	0.01
	(0.10)	(0.10)	(0.26)
…had sex without birth control	0.07	0.03	-0.18
	(0.10)	(0.10)	(0.24)
…had a baby	0.18*	-0.12	-0.45*
	(.09)	(0.11)	(0.23)
How would your parents react if you…			
…had sex	0.01	0.14	0.23
	(0.11)	(0.12)	(0.27)
…were using birth control	0.02	0.01	1.08**
	(0.09)	(0.11)	(0.41)
…had sex without birth control	0.08	-0.01	-0.41
	(0.10)	(0.11)	(0.27)
…had a baby	0.04	0.09	0.38
	(0.09)	(0.09)	(0.24)
Prevalence: Friends			
How many of your friends…			
…have had sex	0.07	0.31*	-0.18
	(0.13)	(0.18)	(0.42)
…are using birth control	-0.04	-0.55***	-0.84**
	(0.11)	(0.14)	(0.30)
…have had sex without birth control	0.12	-0.09	0.16
	(0.12)	(0.13)	(0.28)
…are parents	-0.02	-0.28*	0.43
	(0.11)	(0.14)	(0.29)
Constant	-4.48	-2.33	4.73
	(4.22)	(5.09)	(13.21)
chi2	194.65	80.26	51.64
p	0.00	0.00	0.02
ll	-558.18	-337.7	-103.7
N	42107	6506	1962

Notes: Each column represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses.

All models control for socio-demographic characteristics; prior sexual, contraceptive, and pregnancy experiences; months in study; months in study squared, and number of completed journals.

† p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001; one-tailed tests

Table 3. Hazard models with Time-Varying Perceived Norms on Unintended Pregnancy w/ Desires and Expectations by Parity

	1 0 prior	2 1 prior	3 2 prior
Perceived Norms			
Approval			
How would your friends react if you…			
…had sex	-0.25*	0.02	-0.23
	(0.11)	(0.12)	(0.30)
…were using birth control	0.12	-0.09	0.1
	(0.11)	(0.10)	(0.27)
…had sex without birth control	0.04	0.01	-0.04
	(0.10)	(0.11)	(0.28)
…had a baby	0.18*	-0.12	-0.72**
	(0.10)	(0.11)	(0.29)
How would your parents react if you…			
…had sex	0.01	0.13	0.13
	(0.12)	(0.12)	(0.29)
…were using birth control	0.02	0.02	1.08**
	(0.10)	(0.11)	(0.43)
…had sex without birth control	0.09	0.00	-0.42
	(0.10)	(0.11)	(0.28)
…had a baby	0.03	0.07	0.35
	(0.09)	(0.09)	(0.25)
Prevalence: Friends			
How many of your friends…			
…have had sex	0.03	0.32*	-0.07
	(0.13)	(0.18)	(0.44)
…are using birth control	0.00	-0.49***	-0.5
	(0.11)	(0.14)	(0.36)
…have had sex without birth control	0.05	-0.11	0.11
	(0.12)	(0.13)	(0.31)
…are parents	0.00	-0.32*	0.28
	(0.11)	(0.14)	(0.31)
Desires			
Want to have intercourse next year	-0.02	-0.09	0.76**
	(0.09)	(0.10)	(0.29)
How much want to use some birth control	-0.12	-0.02	-0.6**
	(0.08)	(0.10)	(0.22)
Expectations			
Likelihood of sex in the next year	0.01**	0.00	0.00
	(0.01)	(0.01)	(0.02)
Likelihood of sex w/o BC in the next year	0.00	0.01*	0.01
	(0.00)	(0.00)	(0.01)
Likelihood to get pregnant in the next year	0.01	0.01	-0.01
	(0.01)	(0.01)	(0.01)
Constant	-5.36	-2.38	-1.14
	(4.31)	5.25	15.37
chi2	217.5	88.42	72.8
p	0.00	0.00	0.00
ll	-546.76	-333.6	-93.1
N	42107	6506	1962

Notes: Each column represents a logistic regression model. Coefficients are effects on log-odds. Standard errors in parentheses.

All models control for socio-demographic characteristics; prior sexual, contraceptive, and pregnancy experiences; months in study; months in study squared, and number of completed journals.

† p < 0.10; * p < 0.05; ** p < 0.01; *** p < 0.001; one-tailed tests

Appendix

Descriptive statistics for baseline measures

	Mean	St Dev
African American	0.34	0.47
Dropped out of high school/not enrolled	0.08	0.27
Completed high school/not enrolled	0.21	0.41
Enrolled in high school	0.13	0.34
Enrolled in 2-year college or vocational program	0.29	0.45
Receiving public assistance	0.26	0.44
High religious importance	0.58	0.49
Living with partner	0.16	0.37
Biological mother less than 20 years old at first birth	0.35	0.48
Grew up with two parents (both bio or bio/step)	0.53	0.5
Mother's education less than high school graduate	0.09	0.28
$15,000-44,999	0.28	0.45
$45,000-74,999	0.2	0.4
$75,000 or greater	0.19	0.39
Don't know/refused	0.2	0.4
Age at baseline	19.18	0.57
Age at first sex 16 years or less	0.51	0.5
Number of sexual partners 2 or more	0.57	0.49
Ever had sex without birth control	0.47	0.5
One prior pregnancy	0.17	0.38
Two or more prior pregnancies	0.09	0.28