Running Head: KNOWLEDGE AND ATTITUDES ABOUT BIRTH CONTROL AND FERTILITY

Knowledge, Motivations to Avoid Pregnancy, and Avoidance of Hormonal Methods: A Mixed Methods Approach

Amanda Berger, Ph.D., Kristen Peterson, B.A., Jennifer Manlove, Ph.D., & Lina Guzman, Ph.D.

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Introduction

Young adults (aged 18 to 29) have one of the highest rates of unintended pregnancies and sexually transmitted infections (STIs) of any age group.[5] Yet many sexually-active young adults rely on less effective contraceptive methods,[13] many use methods inconsistently or ineffectively,[16] and many do not use any contraceptive method at all.[13] Given the high risk of this group, there is a clear need to identify ways in which to increase and improve contraceptive use. One way in which this goal can be achieved is in understanding the reasons why women turn to certain methods – or why they avoid these methods. Prior research has revealed that knowledge about contraceptive methods and about fertility, in general, is linked with contraceptive use.[7] Similarly, past research has indentified the important role of attitudes about contraceptive methods and about pregnancy in contraceptive method choice.[6]

Although the extant literature points to the role of knowledge and attitudes in contraceptive method use, these studies have largely relied on single measures of knowledge and/or attitudes, neglecting to acknowledge that it is possible that these characteristics may operate in such a way that distinct groups, or classes, of knowledge and attitudes emerge. That is, these one-dimensional studies have overlooked the important fact that these characteristics co-occur with one another. Moreover, of the studies that have examined, quantitatively, women's knowledge about and attitudes towards birth control and fertility, few have taken the qualitative perspective of women in conjunction with their findings in order to better understand women's knowledge and attitudes and the ways in which these link with contraceptive method choice, use, and behaviors. By examining only quantitative data, we lose the ability to answer the "why" and "how" questions related to women's knowledge and attitudes about contraception, including why women hold certain beliefs about contraception and fertility and how these beliefs informs their

decisions to use or not use various methods.   This represents a potential missed opportunity to explore the ways in which knowledge, motivations, and attitudes interplay to affect complex decisions about contraception and family planning.

The aim of the current study was to fill the gap in the research regarding classes of knowledge, motivations, and attitudes about contraception and fertility. That is, the aim of current study was to examine how knowledge, motivations, and attitudes about contraception and fertility hold together to form classifications of contraceptive perceptions. This study drew from nationally-representative data from young women aged 18 to 29 to conduct a latent classes analysis of six measures of women's knowledge (knowledge about birth control and knowledge about fertility), motivations to avoid pregnancy (reactions toward an unintended pregnancy and fatalistic views of pregnancy), and attitudes toward hormonal methods of contraception (avoidance of hormonal methods and concern about side effects from hormonal methods). Further, this study used qualitative data drawn from 61 women enrolled in two community colleges in the Mid-Atlantic region. Analysis of these data, drawn from semi-structured interviews, allowed us to explore the women's knowledge, motivations, and attitudes – and their link to contraceptive method choice – through rich, descriptive vignettes. That is, we used these women's narratives to expound upon the experiences of similar women whose knowledge, motivations, and attitudes reflected distinct class memberships.

Methods

Data

Quantitative. The quantitative data for this study were drawn from the National Survey of Reproductive and Contraceptive Knowledge (known as the "Fog Zone" study), a nationally-representative survey of 1,800 unmarried 18- to 29-year-old men and women.[15] Data from this

survey were collected in 2008-2009 via telephone interviews using a random digit dial sample, a targeted sample of listed telephone numbers, and a random sample of cell phone numbers.[15] The analytic sample was limited to females only (n=897). The analytic sample omitted women who were not at risk for unintended pregnancies; specifically, women were omitted who had never had sexual intercourse (n=162), who were currently pregnant or trying get pregnant (n=52), or who were medically sterile (n=19). The final analytic sample consisted of 664 women.

Qualitative. The qualitative data presented in this study come from semi-structured interviews conducted in 2009-2010 with 101 unmarried sexually active male and female students ages 18 to 29; 85 of whom were re-interviewed six months after the first interview to examine changes in their relationships and contraceptive behaviors. Respondents were recruited from two community colleges in the Mid-Atlantic region, one located in an urban location and the other in a rural location. Students were eligible to participate in the study if they were: 1) enrolled in one of the partnering colleges; 2) between the ages of 18 to 29; 3) unmarried; 4) heterosexual and sexually active (in the last year); 5) not planning a pregnancy in the next year; and 6) white, black, Hispanic or Asian. For the current study, the sample has been limited to female participants in the first round of interviews (n=61).

Measures

Quantitative. Six 4-level variables (with levels from 1 to 4) were used to identify class membership: two measures of knowledge, two measures of motivations to avoid pregnancy, and two measures of attitudes towards hormonal methods of contraception.

Knowledge of birth control was based on the responses to six questions; the first was a question about which was more effective at preventing pregnancy, the pill or a condom. The remaining five questions were true/false questions: Birth control pills are effective even if a

woman misses taking them for two or three days in a row; Women should "take a break" from the pill every couple of years; If a woman is having side effects with one kind of pill, switching to another type or brand might help; Birth control pills reduce the chance that women will get certain types of cancer; After a woman stops taking birth control pills, she is unable to get pregnant for at least two months. Responses were summed from 0 (low knowledge) to 6 (high knowledge); those who scored a 0-2 were coded as 1; those who scored a 5-6 were coded as 4.

Knowledge of fertility was based on the responses to six questions: the first was based on whether the respondent could identify a woman's fertile period as being roughly between two menstrual periods. The remaining five questions were true/false questions: After giving birth, a woman can get pregnant even before she has her first period; Douching (washing the vagina) after sex can prevent pregnancy; A woman who is still breast feeding cannot get pregnant; Pregnancy is much less likely to occur if a couple has sex standing up; The only way to completely prevent pregnancy is by not having sex. Responses were summed from 0 (low knowledge) to 6 (high knowledge); those who scored a 0-3 were coded as 1.

Motivation to avoid pregnancy was based on one question about whether the respondents said that they would be pleased or upset if they got pregnant or got someone pregnant at this point in their lives. Those who responded that they would be very pleased were coded as 1; those who said they would be a little pleased were coded as 2; those who said they wouldn't care or would be a little upset were coded as 3; and those who said they would be very upset were coded as 4.

Fatalism was based on one question about their agreement with the belief that pregnancy will happen when it is meant to happen, regardless of preventative measures. Those who responded that they strongly disagreed were coded as 1; those who said they disagreed or were

neutral on the statement were coded as 2, those who said they agreed were coded as 3; and those who said they strongly agreed were coded as 4.

Avoidance of hormonal methods of contraception was based on one question about how important it was to them that a contraceptive method be hormone-free. Responses were: not at all important, slightly important, quite important, and extremely important. Those who responded that it was not at all important were coded as 1; those who said that it was extremely important were coded as 4.

Concern about side effects from hormonal methods was assessed by the number of side effect concerns (out of four) that the respondent thought were "quite" or "extremely" likely. These side effects included: weight gain, serious health problems like cancer, decreased sex drive, and mood swings. Responses were not at all likely, slightly likely, quite likely, and extremely likely. Respondents who had no side effect concerns were coded as 1; those with three or four concerns were coded as 4.

Additional measures that were included in this study were sociodemographic variables (age, race/ethnicity, education, religion, current employment/enrollment in school, past year receipt of public assistance, current relationship status, and childbearing status). We also examined contraceptive use, using measures of ever or current use of hormonal methods (which included birth control pills or oral contraceptives, injectible birth control, the birth control patch, an IUD or intrauterine device, birth control implants, or a vaginal ring) and current use of other methods (including condoms, diaphragms, sponges, female condoms, foam, jelly or cream, withdrawal, or the rhythm method or natural family planning).

Qualitative. The interview protocols used to collect the qualitative data included questions about similar constructs to those used in the quantitative measures. Knowledge about

birth control was assessed through close-ended questions that measured the number and type of birth control methods the respondent was familiar with, as well as misperceptions about birth control and fertility or over/under estimations of method effectiveness that emerged throughout the interview narratives. Reports of pregnancy intentions were of particular interest to this analysis and were captured through a number of open-ended questions about motivation to avoid pregnancy, childbearing intentions, and anticipated reaction if the participant were to get pregnant in the next year. Side effect concerns were largely reported in response to general questions about concerns about using various birth control methods and probes about why they chose their current method.

Analytic Methods

  Quantitative. Latent class analyses (LCAs) were conducted to identify classes of knowledge and attitudes about contraception and fertility based on the six aforementioned measures. Latent class analysis was appropriate for this study because LCAs identify individual membership in a group or "class," basing probabilistic class membership on complex response patterns and multiple dimensions, rather than relying on single measures or arbitrary cut-points. In LCAs, there is no perfect test to identify the "right" number of classes that emerge, but a priori knowledge, combined with diagnostic measures can indicate the *optimal* number of classes. In the case of this study, two sets of diagnostics were taken into consideration.

  First, we used the Lo-Mendell-Rubin adjusted likelihood ratio test, which compares the fit of a k - 1 class model with the fit of a k class model, based on the difference in the -2 log likelihood ratio associated with the addition of a class. Classes are added until the p-value is no longer significant. The second set of diagnostics we considered were the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC), which can be used to compare the

fit of models with varying numbers of classes. In the case of the AIC and BIC, lower values indicate a better fit. Though the two measures should be used in tandem, when they differ in the number of optimal classes they indicate, the BIC is typically given more weight, given that the AIC can overestimate the number of optimal classes.

Once an optimal number of classes were identified, we assigned individuals to each class given based on their Gamma estimates, or class membership probabilities. Once membership was assigned, chi-square tests were conducted to examine differences between classes based on sociodemographic characteristic and contraceptive method use. Analyses were weighted and accounted for the complex sampling design. All analyses were conducted in SAS 9.3.

Qualitative. Semi-structured interview protocols were designed to gather information about participants' contraceptive knowledge and behaviors, pregnancy intentions, and relationship dynamics. Demographic and other background data were collected through close-ended questions. Each interview was conducted in a private and quiet space and lasted between 1.5 to 2 hours. Participants received $50 following the completion of each interview.

Upon the completion of each interview, a brief summary was drafted and audio recordings were transcribed. Data were analyzed using an inductive approach which allowed a conceptual framework to emerge from the data.[1,4] While our coding and analysis was informed by past research, we also used open coding, which allowed unanticipated data and findings to emerge. Additionally, we employed axial coding to identify interconnections between these themes. Lastly, we used selective coding to help generate core concepts or ideas about the relationship between relationship dynamics and contraceptive behaviors.

Participants in the qualitative sample were sorted and analyzed to draw out those whose narratives further illustrated the class structure that emerged through the latent class analysis.

NVivo and SPSS software packages were used to organize the data and facilitate further analysis. Interview summaries and transcriptions alongside the coded data were used to assess convergent or divergent findings to the quantitative class structure; that is, we employed a method of "convergent findings," through which we examined data collected independently of the other data, but analyzed the data concurrently to determine whether they produce similar or dissimilar results. That it, the qualitative data was used to elucidate the quantitative findings, and women's narratives were used to describe the experiences of women that may fall in each class. All procedures and materials received IRB approval.

Results

Descriptive

Table 1 presents the key sociodemographic characteristics of the quantitative sample. In the quantitative sample, 60 percent were white, 20 percent were black, 14 percent were Hispanic, and six percent were Asian or another race/ethnicity. One-quarter were aged 18to-19, 42 percent were 20-to-24, and one-third were 25-to-29. Roughly 4 in 10 had a high school education or less. Less than one-fifth (17 percent) reported receiving public assistance in the previous year, and roughly the same proportion (16 percent) reported that they were not currently enrolled in school or employed. Seven out of 10 were currently in a relationship (5 out of 10 dating and 2 out of 10 cohabiting). Three out of 10 reported having multiple sex partners in the previous year. Just over one-third had ever had a child.

Table 2 presents the key sociodemographic characteristics of the qualitative sample. The participants in the qualitative sample were similar to those in the quantitative sample in that both groups of young adult women represented the same age range and racial and ethnic groups. Also, both groups of women were unmarried, sexually active, and not currently pregnant or

trying to get pregnant with regard to gender and age. Data from these women were also collected in roughly the same time period (2008-2009 and 2009-2010 for the quantitative and qualitative sample, respectively). However, the participants in the quantitative and qualitative samples also differed in a few key ways. Most notably, all participants in the qualitative sample were enrolled in a community college, making them more highly educated than a large proportion of participants in the quantitative sample. Also of note is the age distribution; students in the qualitative sample were disproportionately younger (one-half in the qualitative sample were between the ages of 18 to 19, compared with only one-quarter in the quantitative sample). Although both of the samples were racially and ethnically diverse, a greater proportion of respondents in the qualitative sample were racial/ethnic minorities. Specifically, 43 percent of the qualitative sample members were black, compared with 20 percent of the quantitative sample; 21 percent of the qualitative sample members were Hispanic, compared with 14 percent of the quantitative sample.

The qualitative sample also seemed to differ from the quantitative sample in their current contraceptive method choice: a smaller of proportion of women in the qualitative sample were currently using hormonal methods (40 percent compared with 51 percent of the quantitative sample), and a larger proportion was currently relying on other methods (59 percent compared with 31 percent of the quantitative sample). Perhaps the most striking difference if that only 2 percent of the qualitative sample reported that they were currently using not method, compared with 18 percent of the quantitative sample.

Knowledge and Attitude Classes

Using the Lo-Mendell-Ruben test outlined above, the k class model that emerged as being significant was a 7-class model, which, given the sample size and the limited measures in

the model, we rejected. The Lo-Mendell-Ruben test did, however, indicated a reduction in the

significance of an additional class when moving from four to five classes. After the Lo-Mendell-

Ruben test, we examined the AIC and BIC values. Comparing models ranging from a single

class to eight classes, the four class model had the lowest BIC and one of the lowest AIC values.

As such, there was support for a four-class model: Class 1 (the largest group, with over

50 percent of the women in the sample) is high on both knowledge and on motivation; Class 2 is

high on knowledge, but low on motivation; Class 3 is low on knowledge, but high on motivation;

and Class 4 is low on both knowledge and motivation.

Avoidance of hormonal methods and concern about side effects further differentiate these

classes. In particular, Class 1 and Class 3 were consistent in their attitudes toward hormonal

methods: Class 1 was low on both avoidance of hormonal methods *and* low on concerns about

side effects, and Class 3 was high on both. Class 2 and Class 4, however, were not as clearly

defined. The two classes were high on one measure and low on the other – and they differed

from each other in their views in an important way: Class 2 was low on their desire to avoid

hormonal methods, but they were highly concerned about side effects. Class 4, on the other

hand, was high in their desire to avoid hormonal methods (the highest of the four classes), but

low in their concern about side effects (the lowest of the four classes).

Table 3 presents the mean knowledge and attitudes scores for each class. Table 4 depicts

the directionality on each of the three key dimensions that differentiate each class. Table 5 shows

the distribution of contraceptive method use for each class. Table 6 shows the distribution of

contraceptive method use among the qualitative sample.

Class 1: High on knowledge and on motivations ("model" family planning clients)

Knowledge and attitudes about birth control and pregnancy. Class 1 represented more

than half (53 percent) of the quantitative sample (n=367). This group of women was highly

motivated to avoid pregnancy (they were low on fatalism and high on motivation to avoid

pregnancy), had high knowledge (their knowledge was high regarding birth control and

especially about fertility), and had low fears of hormonal methods (they were not trying to avoid

hormones, and they were not overly concerned about side effects).

Demographic description. Class 1 was most similar in demographics to the whole-sample

demographics; they had roughly the same proportions of race/ethnic, age, religious,

socioeconomic (receipt of public assistance and currently employment/enrollment status),

relationship status, and childbearing status breakdowns as those seen in the overall sample (see

Table 1). They were slightly higher on education, though (in fact, this group had the highest

proportion of young women with at least some college education out of all the classes).

Contraceptive method use. Many of these women had ever used or were currently using

hormonal methods and most (two-thirds) of the women who had tried hormonal methods were

still using hormonal methods.

Qualitative vignette. Class 1 in the quantitative sample represented the largest class in

these analyses and the group of women who most resemble the "average" woman in the sample.

The average woman in the qualitative sample was similar to the average in the quantitative

sample (and thus to Class 1) in their motivation to avoid pregnancy (which, overall, was high).

However, women in the qualitative sample had, on average, lower knowledge than the

quantitative sample (with half of this group being assessed as only "moderately informed," and

the other half was assessed as only "somewhat informed") and higher side effect concerns (given

that every woman in this group reported concerns about side effects that led them to rule out at

least one method of hormonal contraception).

"Elizabeth" was a 20-year-old white female who closely resembled the women who were grouped in Class 1 and, thus, the "average" woman in the quantitative sample. However, it is important to note that she did *not* represent the "average" woman in the qualitative sample for the reasons stated above. Elizabeth had just ended a serious relationship with her partner of two and a half years, and, at the time of the interview, she was seeing one casual partner. She reported that she consistently used both the birth control ring and condoms in her current casual relationship. She had previously tried using the pill and the birth control shot, but she experienced nausea and depression on those methods. As such, she reported that she worked with her doctor and "*found one that was appropriate for [her] body. It was a trial and error process.*" She had high familiarity about various birth control methods, reporting that she had health classes in middle and high school that taught her about contraception, but that she currently relied on her doctor to give her the best information. She noted that she would "*go right to [her] doctor*" when she heard about a new birth control method to ask him: "*What are the side effects, and what goes on with that method?*" She reported that she had learned a lot about contraception, including the likelihood of side effects from various methods and the way various methods work; for example, she knew that while she was using the ring, "*if at any point [she] was on antibiotics…[she and her partner] made sure to protect [themselves with a condom].*" Elizabeth had clear goals for her future and was adamant that she needed to avoid an unplanned pregnancy, in part because she was the child of an unplanned pregnancy and partly because, at 20, she believed she was "*too young*" to start a family. Although she said that she would like children in the future, she reported that, "*when I speak of having children, it's a planned pregnancy…when I'm ready to start a family, I want that to be my choice.*"

Class 2: High on knowledge, but low on motivations

Knowledge and attitudes about birth control and pregnancy. Class 2 represented one-quarter (25 percent) of the quantitative sample (n=177). These women were ambivalent about pregnancy (they were highly fatalistic, and they were somewhat low motivation to avoid pregnancy), had high knowledge (they had high knowledge about fertility and especially high knowledge about birth control), and had some fears of hormonal methods (they were not trying to avoid hormones but they had high concerns about side effects).

Demographic description. Class 2 had the smallest proportion of whites and the highest proportion of blacks. They were fairly evenly distributed in age (27 percent were ages 18 to 19, 37 percent were 20 to 24, and 35 percent were 25 to 29). They had the highest percent of Christians. They had the highest percent of women with less than a high school education. They were similar to the overall analytic sample in terms of the proportion of women who received public assistance in the past year and the number of women who were employed or enrolled in school. They had the highest proportion of women who were in dating relationships, but were similar to the overall analytic sample in terms of multiple partnerships and childbearing status.

Contraceptive method use. This class had the lowest proportion of women who had ever used or were currently using hormonal methods. They also had the highest proportion of women who transitioned off hormonal methods. Moreover, this class had the highest proportion of women who were currently using no method of contraception.

Qualitative vignette. "Sharise" was an 18-year-old black female who was exclusively dating her boyfriend for the previous two years, although he was seeing other people on the side. She had used both the shot and the pill in the past. The Depo shot "*made [her] feel nauseous,*" so she switched to the pill which "*didn't have those side effects,*" but she had difficulties remembering to take the pill. Subsequently, Sharise turned to condoms and withdrawal because,

"there really isn't, you know, any side effects to them." Despite her reliance on these methods, Sharise seems to have slightly inaccurate knowledge about them; for example, she tended to overestimate her protection from condoms, saying that they were *"99% effective,"* and underestimating her protection from withdrawal, saying the effectiveness of this method was at *"15%, if that."* She believed that this was putting her at risk of becoming pregnant, but noted that, *"I don't want to [become pregnant] right now, but if it was to happen, I guess it would be okay… we're not really planning. I guess it just happens, but we know, like, if I was to get pregnant, things would be okay."*

Class 3: High on motivation, but low on knowledge

Knowledge and attitudes about birth control and pregnancy. Class 3 represented 17 percent of the quantitative sample (n=100). These women were motivated to avoid pregnancy (they had moderate levels of fatalism, but they were highly motivated to avoid pregnancy). However, they also had low knowledge (their knowledge was low about fertility and birth control), and had a high desire to avoid hormonal methods (they reported that it was quite important to avoid hormones and they were the most concerned about side effects).

Demographic description. Class 3 had the highest proportion of Hispanics (21 percent) and the second lowest proportion of whites (58 percent). These women were the youngest, with three-quarters being under the age of 25; perhaps related to this, they also had a high proportion of women with low level of education (1 in 5 had less than a high school education). This group had the smallest percent of women who had received public assistance in the previous year (12 percent) and the smallest percent (eight percent) who were neither employed nor enrolled in school. This group was also the least likely to be cohabiting (10 percent, compared with 21-41 percent in the other classes) and had the smallest proportion of women who had a child.

Contraceptive method use. Most of these women were not currently using hormonal methods and many had never even tried these methods. However, most (two-thirds) of the women who *had* tried hormonal methods were still using hormonal methods. This class had the highest proportion of women using *other* contraceptive methods.

Qualitative vignette. "Abrianna" was a 19-year-old black female who was using condoms and natural family planning with two casual sexual partners. She felt that condoms were "*pretty reliable*" and that they were the best option for her, noting that, "*to a certain extent, I'm satisfied, as long as it doesn't break.*" Abrianna had low knowledge about fertility, believing that she is most likely to get pregnant, "*right after [her] period.*" Abrianna also had limited knowledge about birth control, and, although she didn't feel that she knows a lot about these methods, she said she would not consider using them. One reason behind this was that Abrianna was highly concerned about the side effects from hormonal contraception. She reported that "*the only thing I really know [about the pill] is that I don't' want to get it, because I'm looking at the commercial, and I'm seeing the whole blood clot thing, and I don't' want to get that!*" Despite her limited knowledge about birth control and fertility and her avoidance of hormonal methods, she reported that she felt strongly about wanting to avoid an unintended pregnancy; she was, "*so certain that [she] do[es]n't want children*" and explained her consistent use of birth control by noting, "*it's because I'm paranoid. I don't want to get pregnant, and I'm constantly thinking about it. I'm constantly checking my period, making sure I'm, you know, not [pregnant] ... I just feel like it would just mess up everything!*"

Class 4: Low on both knowledge and motivation

Knowledge and attitudes about birth control and pregnancy. Class 4 made up a very small proportion (six percent) of the quantitative sample (n=20). This group of women were not

motivated to avoid pregnancy (they were the high on fatalism and were very low – by far the lowest of the classes – on motivation to avoid pregnancy), had low knowledge (they had low knowledge about fertility and had especially low knowledge – the lowest of the four classes – about birth control), and moderate fear of hormonal methods (they reported a high desire to avoid hormones, but this was evidently not the result of side effect concerns, as they were lowest of all groups on concern about side effects from hormonal methods).

Demographic description. Class 4 had the highest proportion of white (70 percent) and Hispanic (20 percent) women. This group of young adult women tended to be older (65 percent are 25-29), but they had the lowest levels of education (8 out of 10 had a high school education or less). This group also had the highest proportion who had received public assistance in the previous year (47 percent) and the highest proportion (45 percent) who were currently unemployed and not enrolled in school. They were, by a large margin, the least likely to have had multiple past year sex partnerships (six percent had more than one partner in the past year, compared with roughly one-third in the other three classes) and the most likely to have be in a relationship (the women in this class were also the most likely to be cohabiting). This group had, by far, the highest proportion of women who have had a child (75 percent, compared with roughly one-third of the women in the other three classes).

Contraceptive method use. Interestingly, this class had the highest proportion of women who had ever used or were currently using hormonal methods. This group also had the lowest proportion of women who transitioned off hormonal methods. This class had the lowest proportion of women who reported that they were using other methods or using no method at all.

Qualitative vignette. "Maylie" was a 19-year-old black female, who had been dating one person for a year and a half. She noted that she primarily used withdrawal, although she had

plans to get on the Pill in the near future. Maylie exhibited low levels of knowledge about reproduction and about various contraceptive methods. When asked about the effectiveness of withdrawal, she reported that prior to her current relationship, "*I never knew – well, I always thought that if you didn't have one [a condom], you'd get pregnant. I never knew that someone could take it out before [ejaculation]."* Maylie also did not seem to know about the availability of various methods; when asked about why she was planning to start using the pill, Maylie replied that "*it just seemed like the one that mostly people used…So that's the only reason why. 'Cause people I know, I know people that had it."* Maylie had some concerns about side effects from the birth control Pill, namely that "*your period can get thrown off,"* but she expressed even greater hesitation about other hormonal methods and the "*new stuff that comes out,"* stating, "*I don't know how they work. You know how stuff sometimes just comes out, it doesn't' work all the time, 'cause it's new."* She was especially concerned about these "newer" methods of contraception, including the birth control patch and ring, thinking that they may not have been as thoroughly tested; at the same time, she reported that she had not talked with anyone about these concerns. When asked about her pregnancy intention, she replied that she was not trying to get pregnant, but she knew that she was not doing as much as she could to prevent pregnancy. She reported "*the chances of me getting pregnancy are kind of high…[because] I'm not on birth control.*" Indeed, when Maylie was interviewed for the second time, she had become pregnant. She reported that "*I knew it was a chance of me getting pregnant, but I didn't think it was that big of a chance…'cause I guess I just wasn't paying attention.*"

Implications for Family Planning Service Delivery

Our bivariate links between classes and hormonal method use in the quantitative

analyses, as well as the vignettes in the qualitative data, suggest that these different groups of women could use varying types of interventions to help reduce their risk of unintended pregnancy. The quantitative data revealed that knowledge, motivations, and attitudes about contraception and fertility operate together in such a way, that they might distinguish groups of women; the qualitative data allowed women's stories to describe the distinct experiences of these women. Based on these analyses, it appears that, in some cases, motivations to prevent pregnancy are high, but knowledge is low. In other cases, knowledge is high but motivations are low, and in others they are both low. In addition, concerns about side effects and desires to avoid hormonal methods may influence the type of methods of contraception that women are willing to consider. This, in turn, has important implications for targeted family planning interventions:

Class 1 (high on knowledge and motivations), the largest group, represents a group of women who seem to have already found ways to meet their family planning needs. They appear to have the knowledge and motivation to support effective and consistent use and are more likely to be using hormonal methods. As such, they may not represent a group with the most urgent need for family planning interventions, compared with other groups of women.

Class 2 (high on knowledge, but low on motivations) presents an interesting challenge to family planning professionals: they already have high knowledge – which means they are probably aware of their risk of unintended pregnancies – yet they are ambivalent about pregnancy and many are not currently using any contraceptive methods. Similarly interesting is the fact that they do not claim to be actively avoiding hormonal methods, yet they maintain high concerns about potential side effects from hormonal methods. This is coupled with the fact that they are the group that has the highest proportion of women who transition off of hormonal

methods. It is possible that these women, like Sharise, transition off hormonal methods because they themselves experienced or perceived side effects from hormonal methods (hence their fear of side effects). In terms of targeted family planning interventions, there appears to be a need to increase motivations to avoid unintended pregnancies among these women – and in fact, many effective pregnancy prevention programs focus on increasing individual attitudes about fertility or motivations to avoid pregnancy based on prior research, which has found that teens and young adults who report a low motivation to avoid pregnancy tend to not use contraception or use less effective methods.[2,12,14] Additionally, there is a need to provide these women with more information about the relatively low risk of side effects associated with hormonal methods, since prior studies have linked side effects concerns to contraceptive method use and choice – and avoidance of hormonal methods.[3,7,8,10]

Class 3 (high on motivations, but low on knowledge) represents a third target population for family planning interventions. They, like Abrianna, appear to be highly motivated to avoid pregnancy, yet they seem to lack the knowledge they need to achieve this goal. This is, perhaps, reflected in the fact that they are using contraception, but were more likely to rely on non-hormonal methods (less effective methods) than the other classes. Given their high fear of side effects and clear avoidance of hormonal methods, it could be that this class represents a group of women who might be "hormone haters," or women who strive to be all-natural and hormone free in their contraceptive choices.[9,11] They should receive information about fertility and birth control options and should be encouraged to use more effective methods.

Class 4 (low on both knowledge and motivations) is a potential target population for family planning interventions. There appears to be a need to improve their knowledge about birth control and about fertility, in general. Future research should seek to better understanding

their motivations (or lack thereof) to avoid unintended pregnancies. While this group of women report that they are using hormonal methods, it is possible that they are not using the methods consistently or effectively, given their low knowledge and low motivation to avoid unintended pregnancy.

Next Steps

This study fills an important gap in the literature regarding the way in which women's knowledge, motivations, and attitudes affect their contraceptive method choice, use, and behaviors. A latent class analysis of nationally-representative data, used in conjunction with women's qualitative experiences, can inform family planning efforts tailored to women with distinct views of contraception and fertility. This study is still in early stages of exploring the quantitative and qualitative data, and, thus, this extended abstract represents an initial description of findings. Our next steps will be to better describe our classes based on knowledge, motivations, and attitudes about hormonal methods and side effects. We will also work to better integrate our qualitative findings, including expanding our vignettes and identifying a vignette for Class 1. In addition, we will include a broader discussion our findings and their implications for family planning research and practice.

References

[1] Bowen, G. A. (2006). Grounded theory and sensitizing concepts. *International Journal of Qualitative Methods, 5*(3).

[2] Bruckner, H., Martin, A., & Bearman, P. S. (2004). Ambivalence and pregnancy: Adolescents' attitudes, contraceptive use and pregnancy. *Perspectives on Sexual and Reproductive Health, 36*(6), 248-257.

[3] Cheung, E., & Freeb, C. (2005). Factors influencing young women's decision making regarding hormonal contraceptives: a qualitative study. *Contraception, 71*, 426– 431.

[4] Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions.* Thousand Oaks, CA: Sage Publications.

[5] Finer, L. B., & Zolna, M. R. (2011). Unintended pregnancy in the United States: Incidence and disparities, 2006. *Contraception, 84*(5), 478-485.

[6] Frost, J. J., & Darroch, J. E. (2008). Factors associated with contraceptive choice and inconsistent method use, United States, 2004. *Perspectives on Sexual and Reproductive Health, 40*(2), 94-104.

[7] Frost, J. J., Lindberg, L. D., & Finer, L. B. (2012). Young adults' contraceptive knowledge, norms and attitudes: Associations with risk of unintended pregnancy. *Perspectives on Sexual and Reproductive Health, 44*(2), 107-112.

[8] Gilliam, M. L., Davis, S. D., Neustadt, A. B., & Levey, E. J. (2009). Contraceptive attitudes among inner-city African American female adolescents: Barriers to effective hormonal contraceptive use. *Journal of Pediatric and Adolescent Gynecology, 22*, 97-104.

[9] Guzman, L., Caal, S., Ramos, M., & Manlove, J. (2011). FABM use among young adult low-income minority women. In *Human Fertility: Where Faith and Science Meet* Milwaukee: Marquette University Press.

[10] Guzman, L., Peterson, K., Ellis, R., Andrews, K., & McCoy-Roth, M. (2010). *Peeking into the bedroom: Relationships and contraceptive behaviors of community college students*. Washington, DC: Child Trends. Report prepared for The National Campaign to Prevent Teen and Unplanned Pregnancy.

[11] Leonard, C., Chavira, W., Coonrod, D., Hart, K. W., & Bay, R. C. (2006). Survey of attitudes regarding natural family planning in an urban Hispanic population. *Contraception, 74*(4), 313-317.

[12] Mikolajczyk, R. T., Stanford, J. B., & Rauchfuss, M. (2003). Factors influencing the choice to use modern natural family planning. *Contraception, 67*(4), 253-258.

[13] Mosher, W. D., & Jones, J. (2010). *Use of contraception in the United States: 1982-2008.* Hyattsville, MD: National Center for Health Statistics, *Vital and Health Statistics.* Series 23, No. 29.

[14] Ryan, S., Franzetta, K., & Manlove, J. (2007). Knowledge, perceptions, and attitudes towards sex and contraception: Influence on contraceptive use patterns within teens' first sexual relationships. *Youth and Society, 39*, 182-208.

[15] The National Campaign to Prevent Teen and Unplanned Pregnancy. (2009). *The fog zone: How misperceptions, magical thinking, and ambivalence put young adults at risk for unplanned pregnancy.* Washington, DC: The National Campaign to Prevent Teen and Unplanned Pregnancy.

[16] Welti, K., Wildsmith, E., & Manlove, J. (2011). *Trends and recent estimates: Contraceptive use among U.S. teens and young adults.* Washington, DC: Child Trends.

Table 1. Sociodemographic Characteristics (Weighted Percents) of Quantitative Sample[1]

	Total Sample	Class 1	Class 2	Class 3	Class 4	χ^2
	N=664	n=367 Weighted % = 53%	n=177 Weighted % = 25%	n=100 Weighted % = 17%	n=20 Weighted % = 6%	
Race/Ethnicity						*
White	60.4	61.8	56.8	58.3	69.6	
Black	20.1	21.2	24.1	14.7	8.8	
Hispanic	13.5	9.1	16.2	21.2	20.1	
Asian/Other	5.9	7.8	3.0	5.8	1.4	
Age						*
18-19	24.0	19.5	27.2	35.2	18.9	
20-24	42.1	47.7	37.4	40.3	16.1	
24-29	33.9	32.8	35.4	24.6	64.9	
Christian						*
No	32.3	38.6	23.1	24.4	37.6	
Yes	67.7	61.4	76.9	75.7	62.4	
Education						*
<High School	16.2	12.8	21.5	21.2	10.7	
High School/GED	26.1	22.5	25.5	24.3	68.3	
Some College+	57.6	64.7	53.0	54.5	21.0	
Public Assistance						*
Did Not Receive Public Assistance in Past Year	83.3	84.6	84.4	87.8	53.1	
Received Public Assistance in Past Year	16.7	15.4	15.6	12.3	46.9	
Employed/Enrolled in School						*
Not Employed/Enrolled in School	15.9	16.1	14.3	7.6	44.5	
Employed/Enrolled in School	84.1	83.9	85.7	92.4	55.5	
Multiple Past Year Partnerships						*
No	69.6	69.7	67.6	64.1	93.7	
Yes	30.4	30.3	32.5	35.9	6.3	
Current Relationship Status						*
No Relationship	31.4	33.6	23.9	39.5	19.3	
Dating or Other Sexual Relationship	47.1	43.1	55.6	49.9	39.3	
Cohabiting	21.6	23.4	20.5	10.6	41.4	
Ever Had Children						*
No	64.9	67.9	66.4	66.6	25.1	
Yes	35.2	32.1	33.7	33.4	74.9	

[1] 664 unmarried women aged 18-29 at risk for unintended pregnancy (sexually active, not pregnant or trying to get pregnant, and not medically sterile)

* $p<0.05$

Table 2. Sociodemographic Characteristics (Percents) of Qualitative Sample[1]

	Total Sample
Race/Ethnicity	
White	29.5
Black	42.6
Hispanic	21.3
Asian/Other	6.6
Age	
18-19	49.2
20-24	45.9
25-29	4.9
Christian	
No	19.7
Yes	80.3
Education	
<High School	--
High School/GED	--
Some College+	100.0
Public Assistance	
Did Not Receive Public Assistance in Past Year	N/A
Received Public Assistance in Past Year	N/A
Employed/Enrolled in School	
Not Employed	21.3
Employed	78.7
Multiple Past Year Partnerships	
No	--
Yes	--
Current Relationship Status	
No relationship	11.5
Dating or Other Sexual Relationship	67.2
Dating multiple partners	11.5
Cohabiting	9.8
Ever Had Children	
No	93.4
Yes	6.6

[1]61 unmarried women ages 18-29 in community college who were at risk for unintended pregnancy (sexually active, and not pregnant or trying to get pregnant)

Table 3. Mean Knowledge and Attitude Scores (Range 1-4) of Quantitative Sample,[1] by Class Membership

	Total Sample	Class 1	Class 2	Class 3	Class 4
	N=664	n=367 Weighted % = 53%	n=177 Weighted % = 25%	n=100 Weighted % = 17%	n=20 Weighted % = 6%
Knowledge					
Knowledge about Birth Control	2.49	2.62	2.73	2.05	1.43
Knowledge about Fertility	2.80	3.15	2.67	2.02	2.45
Avoidance of Hormonal Contraception					
Avoidance of Hormonal Methods	2.25	2.03	2.04	2.97	3.11
Concern about Side Effects from Hormonal Methods	2.18	1.85	2.46	2.93	1.71
Motivations to Avoid Pregnancy					
Motivation to Avoid Pregnancy	3.00	3.35	2.33	3.59	1.00
Fatalism	2.17	1.51	3.16	2.49	3.13

[1] 664 unmarried women aged 18-29 at risk for unintended pregnancy (sexually active, not pregnant or trying to get pregnant, and not medically sterile)

Table 4. Direction of Knowledge and Attitude of Quantitative Sample,[1] by Class Membership

	Class 1	Class 2	Class 3	Class 4
	n=367	n=177	n=100	n=20
	Weighted % = 53%	Weighted % = 25%	Weighted % = 17%	Weighted % = 6%
Knowledge				
Knowledge about Birth Control	High	High	Low	Low
Knowledge about Fertility	High	High	Low	Low
Avoidance of Hormonal Contraception				
Avoidance of Hormonal Methods	Low	Low	High	High
Concern about Side Effects from Hormonal Methods	Low	High	High	Low
Motivations to Avoid Pregnancy				
Motivation to Avoid Pregnancy	High	Low	High	Low
Fatalism	High	Low	High	Low

[1] 664 unmarried women aged 18-29 at risk for unintended pregnancy (sexually active, not pregnant or trying to get pregnant, and not medically sterile)

Table 5. Contraceptive Method Use (Weighted Percents) among Quantitative Sample,[1] by Class

	Total Sample	Class 1	Class 2	Class 3	Class 4	χ^2
	N=664	n=367 Weighted % = 53%	n=177 Weighted % = 25%	n=100 Weighted % = 17%	n=20 Weighted % = 6%	
Ever Used Hormonal						*
No	17.9	14.2	24.3	22.7	11.1	
Yes	82.1	85.8	75.7	77.3	88.9	
Currently Using Hormonal						*
No	48.9	46.4	54.9	51.5	38.1	
Yes	51.1	53.6	45.1	48.5	61.9	
Hormonal Method Use						*
Current	51.1	14.2	24.3	22.7	11.1	
Ever	18.6	32.2	30.6	28.8	27.0	
Never	30.3	53.6	45.1	48.5	61.9	
Current Contraceptive Method Use						*
No Method	17.9	55.5	45.1	48.5	61.9	
Other Methods	30.9	53.4	16.0	24.1	11.9	
Hormonal Methods	51.1	48.2	38.9	27.4	26.2	

[1] 664 unmarried women aged 18-29 at risk for unintended pregnancy (sexually active, not pregnant or trying to get pregnant, and not medically sterile)

* $p<0.05$

Table 6. Contraceptive Method Use (Percent) among Qualitative Sample[1]

	Total Sample
Ever Used Hormonal	
No	--
Yes	--
Currently Using Hormonal	
No	60.4
Yes	39.6
Hormonal Method Use	
Current	--
Ever	--
Never	--
Current Contraceptive Method Use	
No Method	1.8
Other Methods	58.5
Hormonal Methods	39.6

[1]61 unmarried women ages 18-29 in community college who were at risk for unintended pregnancy (sexually active, and not pregnant or trying to get pregnant)