THE RELATIONS BETWEEN ORAL CONTRACEPTIVE MEDICATION ADHERENCE AND RELATIONSHIP SATISFACTION, ATTITUDES TOWARD PREGNANCY, AND RELATIONSHIP COMMITMENT AMONG COLLEGE FEMALES IN HETEROSEXUAL, MONOGAMOUS, AND SEXUAL RELATIONSHIPS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAI‘I AT MĀNOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY IN PSYCHOLOGY

AUGUST 2014

By
Susan Y. Lin

Dissertation Committee:

Stephen N. Haynes, Chairperson
Janet Latner
Scott Sinnett
John Steffen
Susan Hippensteele

Keywords: Medication adherence, college students, oral contraceptive medication
Acknowledgements

The author would like to thank her dissertation committee chair, Stephen Haynes, Ph.D., for his patience with the author and his guidance on this project. She would also like to thank her committee members, Drs. Janet Latner, Scott Sinnett, John Steffen, and Susan Hippensteele, for their comments and suggestions on previous versions of this manuscript. Furthermore, the author would like to thank her six diligent undergraduate assistants, Alison Ackley, Sean “James” John, Kristi Kobayashi, Elisabeth Seamon, Lacey Thompson, and Polo Valequez, who worked tirelessly during the recruitment and data collection phases. Assistance was also provided to the author by colleagues Allison Love, Nova Morrise, Rachael Polokoff, and Phillip “Drew” Raab. This study was financially supported by generous grants from the K. S. Cheng Memorial Scholarship Award, Gartley Research Award, and the Graduate Student Organization Grants and Awards Program. Lastly, this project would not have been possible without the study participants who volunteered their time and effort.
Abstract

Oral contraceptive medications are highly effective in preventing pregnancy but their effectiveness is contingent upon medication adherence. Relationship factors have been found to be associated with the use of a variety of contraceptive methods among adolescents but few studies have examined the role of relationship factors in oral contraceptive medication adherence among college students. The present study surveyed 87 female students at the University of Hawai‘i at Mānoa. The goals of the study were: 1) to provide demographic information regarding the oral contraception medication adherence rate among college females engaged in heterosexual, monogamous, and sexual relationships; and 2) to explore the main and interactive effects of three relationship variables -- relationship satisfaction, attitudes toward pregnancy, and relationship commitment -- on oral contraception medication adherence. The participants completed questionnaires at the beginning and end of one menstrual cycle and provided pill packages for pill counts. The study found a perfect medication adherence rate of 45% among the sample over a two-month period. While the study did not find that oral contraceptive medication adherence was significantly related to relationship satisfaction, attitudes toward pregnancy, or relationship commitment, the study raised important methodological questions about the study of oral contraceptive medication adherence that warrants further research.
# Table of Contents

Chapter I. Introduction………………………………………………… 7

Oral Contraceptive Medications…………………………………… 8

Mechanism of Action in Oral Contraceptive Medications……….. 8

Oral Contraceptive Medications Side Effects……………………. 10

Efficacy and Effectiveness of Common Contraceptive Methods…. 10

Assessing Oral Contraceptive Medication Adherence……………. 11

Oral Contraceptive Medication Adherence among College Females 12

Relationship Characteristics and Oral Contraceptive Medication Use……………………………………………………… 13

Goals of the Study………………………………………………… 15

Chapter II. Methods…………………………………………………… 17

Overall Design……………………………………………………. 17

Recruitment……………………………………………………….. 17

Procedures………………………………………………………… 18

Assessment Measures……………………………………………… 20

Data Reduction and Measures……………………………………... 23

Chapter III. Results………………………………………………… 27

Sample Demographic Characteristics……………………………… 27

Means and Standard Deviations for Variables at Two Times Points 34

Pearson’s Correlations between Independent and Dependent Variables……………………………………………………… 36

Additional Pearson’s Correlations among Length of Relationship and Medication Adherence and Demographic Variables……… 39
Interactive Effects of Relationship Satisfaction, Attitudes toward Pregnancy, and Relationship Commitment on Oral Contraceptive Medication Adherence………………………………… 43

Chapter IV. Discussion................................................................. 46
Future Directions................................................................. 50
Appendices................................................................. 51
References................................................................. 91
List of Tables

1. Study Sample Characteristics................................................................. 28
2. Study Sample Characteristics by Primary Ethnicity Identification........ 30
3. Number of Participants Reporting Number of Days of Missed Pills by Time Point........................................................................................................ 33
4. Means and Standard Deviations for Variables at Two Times Points...... 35
5. Pearson Product-Moment Correlation Coefficients among Independent and Dependent Variables among Independent and Dependent Variables 37
6. Pearson Product-Moment Correlation Coefficients among Independent and Dependent Variables Correlations between Independent and Dependent Variables (after eliminating participants who accurately guessed the purpose of the study)................................................................. 38
7. Mean Number of Days of Missed Pills Last Month by Measure, Demographic Variable, and Time Point................................................................. 40
8. Regression Analysis Examining the Variance in Self-Reported Medication at Time 2 Accounted for by Relationship Satisfaction, Attitudes Toward Pregnancy, and Relationship Commitment at Time 1 and Time 2........................................................................................................ 44
CHAPTER I. INTRODUCTION

The study of medication adherence is a growing field largely as a result of the increases in the number of chronic conditions that can be successfully managed by the patient (DeMatteo, 2004). Medication adherence refers to the degree to which a patient follows recommendations by health professionals regarding the use of medication. Despite advances in pharmacology, a patient’s cooperation is paramount to the success of a pharmacological intervention. As the 13th United States (U.S.) Surgeon General, Dr. Everett Koop, noted, “Drugs don’t work in patients that don’t take them” (cited in Osterberg & Blaschke, 2005). In order to maximize the effectiveness of medications, health professionals need to collaborate with patients to problem-solve barriers to medication adherence. However, medication adherence involves complex cognitive, social, and behavioral factors, posing challenges for researchers who study it. Study foci and methods vary by medication, disease, and target population and there is no gold standard for measuring adherence (DeMatteo, 2004).

One of the priorities of Healthy People 2020, a 10-year national plan for improving the health outcomes of Americans, is on family planning, specifically the reduction of unplanned pregnancies and the increase in pregnancy planning and spacing (U.S. Department of Health and Human Services, 2012). In 1994 and 2001, national surveys found that 49% of the pregnancies in the United States were unintended at the time that pregnancy occurred (Finer & Henshaw, 2006). The U.S. Center for Disease Control and Prevention defined “unintended pregnancy” as “a pregnancy that is mistimed, unplanned, or unwanted at the time of conception” (CDC, 2012). Unintended pregnancies take a social and economic toll on society and those involved; unintended pregnancies are associated with poor perinatal and antenatal
care and health outcomes for mothers and children (for a review, see Gipson, Koenig, Hindin, 2008). The goal set out by Healthy People 2020 is to reduce rate of unintended pregnancies to 44% (U.S. Department of Health and Human Services, 2012).

The rate of unintended pregnancy is highest among women between ages 18 to 19 and 20 to 24; for young women in these ages groups, the unintended pregnancy rate is one in ten (Finer & Henshaw, 2006). However, unintended pregnancy rates are unevenly distributed among demographic groups; with higher rates among women who are between ages 18 and 24, unmarried, living below the poverty line, without a high school diploma, and African- or Hispanic-American (Kost et al., 2008).

The most commonly used type of contraceptive method by American women between ages 15 and 29 is hormonal oral contraceptive medication. Approximately 21.3% of the females in this age group used oral contraceptive medication between 2006 and 2008 (Mosher & Jones, 2010). Like other types of pharmacological interventions, medication adherence is crucial in ensuring the method’s effectiveness.

**Oral Contraceptive Medications**

Oral contraceptive medication is a type of reversible, hormonal contraceptive method that is taken orally to prevent pregnancy. Although oral contraceptive medications do not protect against sexually transmitted infections (STI), reasons to use them include: ease of use, high effectiveness, and non-contraceptive benefits, such as reducing the likelihood of dysfunctional uterine bleeding, recurrent luteal phase ovarian cysts, acne, and polycystic ovarian syndrome (Nelson, 2009; Philipson, Wakefield, & Kasparian, 2011). The present study is only concerned with the use of oral contraceptive medications for the purpose of preventing pregnancy.

**Mechanism of Action in Oral Contraceptive Medications**

Two types of oral contraceptive medications are available: the estrogen-progestin
combined and the progestin-only types. Combined oral contraceptives act primarily by maintaining a constant level of estrogen and progestin in the bloodstream, which suppress ovulation through a negative feedback loop to the hypothalamic-pituitary system and thicken the cervical mucus to prevent sperm from entering the upper genital tract (Nelson, 2009). The combined types are more widely available than the progestin-only types, but for those with medical conditions where the combined types are contraindicated, such as those who smoke or have hypertension, the progestin-only type is a possible alternative (Nelson, 2009, Raymond, 2009). Progestin-only contraceptive medication acts primarily by maintaining a constant level of progestin that inhibits ovulation, thickens cervical mucus, and alters the endometrium environment to inhibit egg implantation (Raymond, 2009). Both types of medications are usually taken daily.

For maximum effects, the doses are taken at the same time each day to maintain the level of the active ingredients in the bloodstream, given the relative short half-life of hormone steroids in blocking ovulation (Hall, White, Reame, & Westhoff, 2010). Different medications differ in their tolerances for deviation from scheduled tablet intake (Kost, Singh, Vaughan, Trussell, & Bankole, 2008); for example, the progestin-only types require more stringent dosing adherence than do the combined types (Raymond, 2009). The recommendations regarding missed doses vary by medication; no study of which this investigator is aware has estimated the amount of increased risk of pregnancy following each additional missed dose.

The combined oral contraceptive medication comes in different dosing packages. Most types contain 21, 28, or 91 active pills and the packages may include inactive pills that help in maintaining the daily routine of pill-taking. There are no hormones contained in the inactive pills, leading the woman to menstruate during those days
The combined type also comes in two different formulations: the monophasic, which contains equal amounts of estrogen and progestin in all of the active pills, or the multiphasic, which contains varying amounts of estrogen and progestin throughout the dosage cycle. Progestin-only contraceptive medications do not offer these options.

**Oral Contraception Medications Side Effects**

Common side effects of oral contraceptive medications include menstrual cycle disturbances that may include unscheduled vaginal bleeding or an absence of withdrawal bleeding while on the inactive tablets, headaches, nausea, weight gain, breast tenderness, depression, decreased libido, increased blood pressure, and hyperlipidemia (Nelson, 2009). These side effects can be a barrier to medication adherence (Mosher & Jones, 2010; Rosenberg, Waugh, & Meehan, 1995).

**Efficacy and Effectiveness of Common Contraceptive Methods**

Without the use of a contraceptive method, the one-year pregnancy rate among sexually active women of reproductive age is approximately 85% (Trussell, 2007). In clinical trials studying the efficacy of various contraceptive methods, under a perfect-use condition, the pregnancy rate is approximately 0.3% during the perfect use of oral contraceptive medication, compared to 0.5% after female sterilization, and 2% during male condom use. In epidemiological studies, during typical use, the pregnancy rate is approximately 8% during oral contraceptive medication use, compared to 0.5% after female sterilization, and 15% during male condom use (Trussell, 2007). There was no significant change between 1995 and 2002 in pregnancy rates among those people using oral contraceptive medication and male condom (Kost et al., 2008). In a 2001 national study, 40% of the unintended
pregnancies occurred in women who were purportedly using some contraceptive method to prevent pregnancy due to reasons such as misuse or nonadherence to contraceptive methods (Finer & Henshaw, 2006), highlighting the fact that the availability of efficacious methods is not enough and patients’ full participation is tantamount to the effectiveness of the contraceptive methods.

Assessing Oral Contraceptive Medication Adherence

No standard way of measuring oral contraceptive medication adherence was found in the literature and the lack of standardized terminology, outcome measures, and adherence measurement strategies are recognized limitations of the research in this area (Hall et al., 2010). Hall and colleagues’ literature review of 38 English-language peer-reviewed journal articles published from January 1966 to December 2009 revealed that the most common methods used to measure oral contraceptive medication adherence relied on clients’ reports. In over 70% of the publications reviewed, interviewer-administered questionnaires, self-administered questionnaires, and diaries were used as the primary methods of measuring oral contraceptive medication adherence. Details about the questions used in these studies are vague, making replication of protocols difficult. While self-report methods are convenient, non-invasive, and cost-effective, social desirability bias and memory errors and bias are potential threats to validity. Direct methods of assessing adherence, such as measuring serum level and biomarkers, appear to increase the validity of the results, but the studies reviewed did not account for possible demand characteristics, such as increased compliance prior to appointment days, that may confound results. Because the timing of the medication dosage is important in oral contraceptive medication, electronic monitoring devices appear to be the best solution. However, these devices and their programs are generally expensive and few studies have used
Oral Contraception Medication Adherence Among College Females

Although the largest group of contraceptive method users is between 15 and 29 (Mosher & Jones, 2010), a period of time when many are attending college, only two published articles on oral contraceptive medication adherence among college females were found. Both looked at oral contraceptive medication use over a three-month period. In one study, Gilliam and colleagues (2010) found that 70% of 137 participants reported perfect oral contraceptive medication adherence (i.e., never missing an active pill) during the first month. The percentage of those who reported perfect adherence was 64% in the second month and 65% in the third month. Overall, 45% of the participants reported perfect adherence during all three months. Drawing from the same sample but using different inclusion criteria, Hughey and colleagues (2010) found 45% of 112 students reported perfect adherence over a three-month period. Other studies regarding college-aged samples (but who were not necessarily attending college) did not focus specifically on oral contraceptive medication, but instead examined factors related to adherence with all types of contraceptive methods (Huber & Ersek, 2009; Kusunoki & Upchurch, 2011; Manlove et al., 2011; Whitley, 1990). There are also a number of studies that focused on general contraceptive use among adolescents (Ford, Sohn, & Lepkowski, 2001; Manning, Flanigan, Giordano & Longmore, 2009).

Previous studies of psychosocial factors associated with the non-adherence of oral contraceptive among various populations of females have examined increased life stressors (Hughey et al., 2010), misinformation about the medication (Clark, 2001), a lack of support from partners (Kerns, Westhoff, Morroni, & Murphy, 2003), a history of multiple episodes of anxiety lasting more than six months (Walsemann & Perez,
2006), lack of an established routine for taking medications (Rosenberg et al., 1995), and an ineffective use of reminders to take medication (Hou, Hurwitz, Kavanagh, Fortin, & Goldberg, 2010; Hughey et al., 2010).

**Relationship Characteristics and Oral Contraceptive Medication Use**

Given that one of the main purposes of taking oral contraceptive medication is to prevent pregnancy, it is important to examine the relationship context, particularly their sexual relationships, within which women are taking these medications. Some studies have examined the pattern of usage and choices of contraceptive methods associated with relationship characteristics, such as the duration of the relationship and commitment of partners, among young adults in “romantic relationships” (Ford et al., 2001; Frost & Durroch, 2008; Kusunoki & Upchurch, 2011; Manlove et al., 2011; Manning et al., 2009), although none of these studies focused specifically on college females.

Studies comparing several contraceptive methods have shown that male condoms are frequently used in new or casual relationship while hormonal methods, such as oral contraceptive medications, are more frequently used in more established or serious relationships (Frost & Durroch, 2008; Kusunoki & Upchurch, 2011; Manlove et al., 2011). This may be explained by the fact that condoms provide protection against both STI as well as pregnancy. Those who have discussed cohabitation or marriage with their partners may be in a more stable relationship where STI is less of a concern.

Because of this differential preference in contraceptive method among people in relationships of different duration and commitment level, studies may come to different conclusions depending on the methods and samples included. But, few studies have taken the approach to focus on one specific type of contraceptive method
and a homogenous group of people.

The quality of the relationship may be associated with oral contraceptive medication adherence. Some examples of this line of research are by Manlove and colleagues (2011), Manning and colleagues (2009), and Kern and colleagues (2003; effect sizes for these studies are reported in Appendix A). Manlove and colleagues examined the feelings of closeness to their partner and perceived care from their partner among participants 18 to 26 years. Those women who rated their feelings of closeness to their partners and perceived care from their partners higher were more likely than those who rated these factors lower to use hormonal methods of contraception compared to other methods of contraception during their last sexual encounter. Manning and colleagues (2009) found that relationships among 13-, 15-, and 17-year-old adolescents that were rated as highly negative or positive were both associated with lower rate of consistency in condom use. In a study relevant to couple’s communication, Kerns and colleagues (2003) found that women aged 13 to 46 with partners who did not know about their contraceptive medication usage were over three times more likely than those women with partners who knew about their contraceptive medication usage to discontinue the medication before the second package.

There also appears to be a significant correlation between attitudes toward pregnancy and women’s contraceptive method use. In a study by Kern and colleagues (2003), women who reported they would be happy if they became pregnant in the next six months were about 2.3 times more likely to discontinue the oral contraceptive medication before the second package, in comparison to those women who reported they would be unhappy if they became pregnant in the next six months. (Kern et al., 2003). In addition, women aged 18 to 25 who reported that they did not desire to have
a child with their partner in the next two years were almost twice as likely to use any type of contraceptive method, in comparison to those who reported a desire for children (Kraft et al., 2010).

**Goals of the Study**

Oral contraception medication adherence is important in the prevention of unintended pregnancy. College campuses are good locations for research on factors associated with oral contraception medication adherence as approximately half of all oral contraceptive medication users are between 18 and 29 years old. In considering some of the weaknesses in the past research, this study focuses on just one demographic group, one contraceptive method, and one type of romantic relationship – college females involved in a heterosexual, monogamous, sexual relationship using oral contraceptive medication for the purpose of preventing pregnancy.

The present study has several goals. First, as there is little research on the use of oral contraceptive medication in college females, this study could contribute to the literature by estimating the rate of oral contraceptive medication adherence among college females involved in heterosexual, monogamous relationships. Second, the study would examine possible independent and interactive effects of four independent variables -- relationship satisfaction at the beginning and at the end of one menstrual cycle, attitudes toward pregnancy, and relationship commitment -- on oral contraceptive medication adherence. There are eight sub-areas of exploration involved in this second goal of the study:

1) To explore the relation between a college female's relationship satisfaction, as measured at the beginning of a menstrual cycle, and her oral contraceptive medication adherence for that menstrual cycle;
2) To explore the relation between a college female's relationship satisfaction, as measured at the end of a menstrual cycle, and her oral contraceptive medication adherence for that menstrual cycle;

3) To explore the relation between the change score between Time 1 and Time 2 of a college female's relationship satisfaction, and her oral contraceptive medication adherence for that menstrual cycle;

4) To explore the relation between a college female's relationship satisfaction and her oral contraceptive medication adherence as outlined in 1-3 while considering relationship commitment as a mediating factor;

5) To explore the relation between a college female's relationship satisfaction is associated with her oral contraceptive medication adherence as outlined in 1-3 while considering relationship commitment as a moderating factor;

6) To explore the relation between a college female's relationship satisfaction and her oral contraceptive medication adherence as outlined in 1-3 while considering attitudes towards pregnancy as a mediating factor;

7) To explore the relation between a college female's relationship satisfaction and her oral contraceptive medication adherence as outlined in 1-3 while considering attitudes toward pregnancy a moderating factor; and

8) To explore the degree of variances that can be accounted for by 1-7 in the relation between a college female's relationship satisfaction and her oral contraceptive medication adherence for one menstrual cycle.
CHAPTER II. METHODS

Overall Design

This study examined the degree to which relationship satisfaction, attitudes toward pregnancy, and relationship commitment at the beginning (Time 1) and at the end (Time 2) of one menstrual cycle, independently and in interaction, accounted for variances in oral contraception medication adherence in college females involved in heterosexual, monogamous, and sexual relationships. The independent variables were measured by using self-report questionnaires and the dependent variable was measured by using pill counts of the medication blister package and self-reported number of pills missed in the previous menstrual cycle.

Recruitment

The recruitment was conducted between February and May 2012 via e-mail listservs, campus-wide posters, hand flyers, classroom presentations, social media site postings, recruitment booths, and the word of mouth by the study investigator and six undergraduate research assistants.

When a potential participant expressed interest in participating in the study, a researcher gave the student a Screening Questionnaire to assess her eligibility to participate. The Screening Questionnaire (see Appendix B) was available in print and digital formats. The inclusion criteria were that the participants were required to: 1) be enrolled as a student at the University of Hawai‘i at Mānoa, 2) use a monthly oral contraceptive medication for the purpose of preventing pregnancy, 3) engage in a heterosexual, monogamous, and sexual relationship, and 4) not be currently pregnant.

If the student met all of the inclusion criteria, she was given more information about the study and an appointment time, which coincided with the first week of her next menstrual cycle. Frequently, this appointment would also be the week that she
would be taking her inactive pills if she was on the type of medication that contains a set of inactive pills.

**Procedures**

A day or two prior to the first appointment (Time 1), an e-mail or telephone reminder, depending on her preferences, was sent to the potential participant. The reminder included the location, the time, and date of the appointment, and the name of the research assistant who was assigned for the session. The potential participants were asked to respond to the reminder to indicate that they had received it.

At the beginning of the first appointment, the research assistant asked the participant if she was indeed on her inactive pills. Then, the participant was given copies of the informed consent form (see Appendix C) that detailed the study procedure and participant responsibilities. The participant was informed that the goal of the study was to examine relationship factors among college women who were using oral contraceptive medications and that there would be a follow-up appointment.

After the participant signed the informed consent form, she completed a packet of questionnaires. This packet contained the Background Information Questionnaire, Relationship Assessment Scale (Hendrick, 1988), and Investment Model Scale (Rusbult, Martz, & Agnew, 1998); the questionnaires were given in this order. The participant was also asked to indicate a unique 8-digit study identification number, comprised of the last four digits of her student identification number followed by four digits of the month and date of her birth date (MM/DD), which would be used to link her Time 1 and Time 2 questionnaires.

The session concluded with the completion of a Follow-Up Contact Information sheet where the participant indicated how she would like to be reminded of her
follow-up appointment, via email or telephone (see Appendix D). Then, she scheduled
the follow-up appointment for a time three weeks later. This first session lasted 15 to
20 minutes.

One or two days prior to the second appointment (Time 2), the participant
received an email or telephone reminder. The reminder asked the participant to bring
her medication package that she was using for that month. To ensure the accuracy of
the pill counts and to discourage altering of the medication package, it was necessary
to help reduce social desirability bias and observer effects. Unlike studies on
HIV/AIDS and STI, social desirability bias is often a neglected problem in the
research on family planning (Stuart & Grimes, 2009). To minimize the effects of
social desirability bias in this study, the researcher introduced a cover story when
asking the participant to bring in her medication package (see Appendix E). The cover
story asked the participant to bring in the medication package that she has been using
that month so that the research assistant could verify the exact type used.

During the second appointment (Time 2), the participant was asked to give the
research assistant her medication package from the current month to “double check,”
while the participant began to complete another set of questionnaires consisting of, in
order, the Follow-Up Questionnaire, the Relationship Assessment Scale (Hendrick,
1988), and the Investment Model Scale (Rusbult, Martz, & Agnew, 1998). At this time,
the research assistant photographed the medication package and returned it to the
participant. Following the questionnaires, the research assistant administered the
Debriefing Questions (see Appendix F), which contained five questions about the
participant’s experience with the study. One of these questions assessed whether the
participant accurately guessed that this was a study interested in medication adherence.
The session concluded with a thorough debriefing of the true purpose of the study (see
Appendix G). During debriefing portion, the research assistant asked the participant not to share the study’s true purpose with anyone else to protect the integrity of the study. The participant was offered a $5 gift card to Starbucks, Jamba Juice, or Subway as a token of appreciation. The entire appointment was 15 to 20 minutes long. If the medication package were not brought to this appointment, then the appointment would conclude after the completion of the Follow-Up Questionnaire and another appointment was made for the participant to return as soon as possible with the medication package. When the participant returned with the medication package during that third appointment, the research assistant administered the Debriefing Questions and debriefing procedures.

Assessment Measures

*Relationship Assessment Scale* (RAS; Hendrick, 1988; see Appendix H). This is a 7-item self-report questionnaire designed to measure relationship satisfaction in romantically-involved couples. Each item is rated on a 5-point Likert scale, ranging from 1 “low satisfaction” to 5 “high satisfaction” and the score is obtained by calculating the total score mean. Items 4 and 7 use reverse scoring. The measure had been used previously with a college sample with moderate internal consistency ($\alpha = 0.86$, Hendrick, 1988). Graham, Diebel, and Barnow’s meta-analysis (2011) showed that the RAS has moderate internal consistency (mean $\alpha$ across studies was .87) and suggested that studies with older samples might produce more reliable scores. Among a college undergraduate sample, the RAS demonstrated high correlation ($r = .80, p < .05$, Hendrick, 1988) with the total score of one of the most widely-used marital adjustment questionnaires, the Dyadic Adjustment Scale (DAS; Spanier, 1976). Vaughn and Baier (1999) also found a high correlation ($r = .84, p < .01$) between RAS and DAS total score among a clinical adult couple sample, suggesting convergent
validity between RAS and DAS. Among the subscales, the RAS appeared to be most highly correlated with the DAS Satisfaction Subscale ($r = .47, p < .01; \text{Vaughn} & \text{Baier, 1999}$). A modified version has been found to have moderate test-retest reliability over a two to three week period ($r(71) = .74; \text{Renshaw, McKnight, Caska, & Blais, 2011}$).

The version of the questionnaire used in this study was modified to ask the participants to respond to the items based on the past month. The Cronbach’s alpha for internal consistency obtained for this measure based on the present study’s sample was .84 for Time 1 and .87 for Time 2. The test-retest reliability coefficient was very good ($r(83) = .80, p < .01$).

Investment Model Scale (Rusbult, Martz, & Agnew, 1998; see Appendix I). This is a 25-item self-report questionnaire designed to measure four constructs in romantic relationships based on the Investment Model: Commitment Level and three bases of dependence (Satisfaction Level, Quality of Alternative, and Investment Size). Two types of items are used to measure each base of dependence: facet and global items. Facet items are concrete examples that illustrate each construct, and are rated on a 4-point scale from “Don’t Agree at All” to “Completely Agree.” These responses are not included in the score calculation. Global items are general measures of the construct and are rated on 9-point Likert scale, ranging from 0 “Do Not Agree At All” to 8 “Agree Completely.” Each construct score is represented by the mean score of the global items in that subscale. Using a college sample, Rusbult and colleagues (1998) found moderate to good internal consistency for each construct in the final version of the measure ($\alpha = .95, .94, .88, .82$; Commitment, Satisfaction, Quality of Alternative, and Investment Size respectively). Factor analysis demonstrated four independent constructs, with inter-factor correlations found as expected by the Investment Model.
Commitment, Satisfaction, and Investment Size were positively correlated to DAS Total and Subscales scores and Quality of Alternative factor was negatively correlated to DAS Total and Subscale scores.

The Cronbach’s alphas for this measure based on this study’s sample Time 1 data were .82, .88, .79, and .80 for Commitment, Satisfaction, Quality of Alternative, and Investment Size respectively; and based on Time 2 data were .84, .93, .83, .76 for Commitment, Satisfaction, Quality of Alternative, and Investment Size respectively.

Background Information Questionnaire (see Appendix J; see Appendix K for “Oral Contraceptive Medication List”). Background Information Questionnaire was developed for this study by the investigator. The questionnaire had been examined by three Master’s level female clinical psychology graduate students for face validity and question clarity. The questionnaire assessed variables that have been shown in published studies to be related to oral contraceptive medication adherence. The questionnaire included questions (citations in parentheses indicate studies from which the questions were derived) about attitudes toward pregnancy, which is one of the variables of interest in this study (Kern et al., 2003; Kraft et al., 2010).

Two related questions regarding attitudes toward pregnancy were: 1) “How would you describe the emotions that you would feel if you were to become pregnant right now?” measured using a Likert scale from 1 “Very Positive” to 5 “Very Negative” and 2) “Considering only yourself, how important is it not to get pregnant right now?” measured using a Likert scale from 1 “Not At All Important” to 5 “Extremely Important.”

A self-reported medication adherence measure was also included in the questionnaire. The participant was also asked the number of days that she had missed taking a pill in the last month.
Other questions included in this questionnaire were regarding the participant’s age and ethnicity (Finer & Henshaw, 2006; Hughey et al., 2010), partner’s age and ethnicity (Manlove et al., 2011), cohabitation status (Finer & Henshaw, 2006; Hughey et al., 2010; Manlove et al., 2011), length of relationship (Kraft et al., 2010), oral contraceptive medication information, adherence practices, partner support in use of oral contraceptive medication (Kern et al., 2003), and back-up contraceptive methods.

Follow-Up Questionnaire (see Appendix L). The Follow-Up Questionnaire was developed by the investigator for this study and inquired about changes in medication and relationship status during the past 30 days. The questionnaire was examined for face validity and question clarity by the same three Master’s level female clinical psychology graduate students who examined the Background Information Questionnaire. It also re-administered several questions from the Background Information Questionnaire, including attitudes toward pregnancy, number of days of missed pill, frequency of sexual activities, medication adherence, and use of other contraceptive methods in order to assess changes in these variables over the course of a menstrual cycle.

Data Reduction and Measures

Medication adherence. The medication adherence variable was measured by two methods: pill counts and self-reported information via a questionnaire. The pill counts were obtained by observing the number of active pills missing in the blister package during Time 2.

In the field of medication adherence research, pill count is the most frequently used medication adherence assessment method in clinical trials (Gossec, Tubach, Dougados, Ravaud, 2007) and pill count was found to be superior to 24-hour recall or refill history in its ability to determine detect change across time (Lee et al., 2007).
While the pill count method is convenient, observable, and cost-effective (Hall et al., 2010), there are several limitations to this method. For example, it is unable to identify the time that the dosages were taken and the medication packages can be easily altered by the participant to inflate apparent adherence.

Since it is ideal to have multiple methods of measurement to increase reliability and validity of measures, this study used also self-reported, retrospective information to assess adherence, in conjunction to pill count. Garber and colleagues (2004) conducted a literature review comparing self-reported with other types of measures of medication adherence and found that self-reported information based on questionnaires and diaries to be moderately or highly concordant with non-self-report measures (i.e., electronic measures, drug levels, pill count/canister weight, claims data, and clinical opinions). On the other hand, other researchers have found self-report methods to overestimate adherence (Potter et al., 1996; Stuart & Grimes, 2009). Questionnaire-based self-reports had been found to be more concordant with non-self-reported information than have interview-based self-reports (Garber et al., 2004). Although the literature has been inconclusive about the validity of self-reported information as a method of measuring medication adherence, this is still a commonly used assessment method and it is easy and of low cost (Hall et al., 2010). In this study, a question regarding the number of pills missed in the last month was included in both the Background Information Questionnaire and the Follow-Up Questionnaire.

After the data had been collected, no variation across participants was observed in the number of pills missed, that is to say, none of the packages seen during Time 2 showed evidence of missed pills. Qualitative data from interviews with participants indicated that participants took the missed pill as soon as they remembered it or took the missed pill the following day along with the pill for that day, as directed by their
health providers.

Because of the lack of variance in the researcher-observed data on adherence posed a problem for statistical analyses, statistical analyses involving medication adherence variable only used self-reported data (i.e., number of missed pills past month). Self-reported medication adherence at Time 1 and at Time 2 were weakly correlated \( r(83) = .29, p < .01 \). Of the 83 participants who reported medication adherence at both time points, 45% reported perfect adherence over 2-months period.\(^1\)

**Relationship Satisfaction.** This variable was measured by a Relationship Satisfaction Measure, the sum of the z-scores of the Relationship Assessment Scale and Investment Model Scale-Satisfaction subscale. The RAS score and IMS-Satisfaction subscale scores were found to be highly correlated \( r(87) = .79, p < .01 \) for Time 1; \( r(83) = .89, p < .01 \) for Time 2). In both scales, higher mean scores indicated higher relationship satisfaction. Since the two measures were highly correlated, the z-scores of the two measures’ mean scores were combined, with higher z-scores indicating higher relationship satisfaction. The test-retest reliability of the Relationship Satisfaction measure was \( r(83) = .80, p < .01 \).

**Attitudes toward pregnancy.** This variable was measured by the self-reported ratings for the two questions regarding attitudes toward pregnancy: 1) “How would you describe the emotions that you would feel if you were to become pregnant right now?” and 2) “Considering only yourself, how important is it not to get pregnant right now?” The ratings obtained for these two questions were moderately negatively correlated \( r(87) = -.46, p < .01 \) for Time 1 and \( r(83) = -.45, p < .01 \) for Time 2).

---

\(^1\) With data with this type of skewness, sometimes log transformations are performed. However, this sample size and distribution indicate that such analysis is not appropriate.
The Attitudes Toward Pregnancy variable was calculated by adding the scores from the two questions, with reverse scoring for the second question, with higher total score suggesting more positive attitudes towards the possibility of undergoing a pregnancy at this time, and then dividing the sum by 2. Haynes, Smith, & Hunsley (2011) suggested that using multiple measures of a single construct to form a composite measure produces a more valid measure of the construct, provided that the measures are measuring the same construct and do not have correlated errors. Based on this study, the test-retest reliability for both questions was high ($r(83) = .84$, $p < .01$ for “How would you feel if you were to become pregnant right now”, and $r(83) = .72$, $p < .01$ for “How important is it not to get pregnant right now”).

**Relationship commitment.** The variable was measured by the Commitment subscale score of the Investment Model Scale, with higher total score indicating a higher level of commitment to the relationship.
CHAPTER III. RESULTS

Sample Demographic Characteristics

The sample was comprised of 87 female students enrolled at the University of Hawai‘i at Mānoa campus during the Spring 2012 semester, involved in heterosexual, monogamous, and sexual relationships and taking oral contraceptive medication for the purpose of preventing pregnancy. Eighty-three participants returned for their Time 2 appointments; the average number of days between the two appointments was 21 days. The average age of the participants was 22, with a range of 18-45 years (SD = 4.5; Table 1). The majority (71.3%) of the participants were residents of the state of Hawai‘i. At Time 1, one participant reported being uncertain as to whether she was pregnant; at Time 2, one participant (a different individual) reported the same. The majority (89.7%) of the participants was unmarried and 62.1% of the participants were not cohabiting with their partners. Of those who were not cohabiting, close to half (48.3%) had discussed cohabitation (Table 1). The average length of relationships among this group was 30 months, with a range of 1-227 months and the distribution was bimodal at 3 and 14 months. At Time 2, two participants reported they were no longer with the same partner that they were with at Time 1.
Table 1.

*Study Sample Characteristics*

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td>87</td>
</tr>
<tr>
<td>Time 2 (study return rate)</td>
<td>83 (95.4)</td>
</tr>
<tr>
<td>Average Age (range 18-45)</td>
<td>22.6</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Not married or engaged</td>
<td>78 (89.7)</td>
</tr>
<tr>
<td>Married</td>
<td>7 (8.0)</td>
</tr>
<tr>
<td>Engaged</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>Residency of participants</td>
<td></td>
</tr>
<tr>
<td>Hawai‘i resident</td>
<td>62 (71.3)</td>
</tr>
<tr>
<td>Out-of state</td>
<td>22 (25.3)</td>
</tr>
<tr>
<td>International</td>
<td>3 (3.4)</td>
</tr>
<tr>
<td>Living arrangement with partner</td>
<td></td>
</tr>
<tr>
<td>Cohabiting</td>
<td>33 (37.9)</td>
</tr>
<tr>
<td>Not cohabiting</td>
<td>54 (62.1)</td>
</tr>
<tr>
<td>Have discussed cohabiting</td>
<td>42 (77.8)</td>
</tr>
<tr>
<td>Did not accurately guess the purpose of the study at Time 2</td>
<td>70 (83)</td>
</tr>
</tbody>
</table>
Participants’ ethnicities. Fifty-two percent of the sample self-identified as multi-ethnic. Those who self-identified as multi-ethnic were asked to select a primary ethnic identification for the purpose of the study. When primary ethnic identifications were taken into account, the largest ethnic group identified was Caucasian or White (31%), followed by Japanese (25%). The remaining ethnic groups were each identified by fewer than 10% of the participants. There were four participants who did not identify their ethnicities (Table 2).

Male partner characteristics. On average, the male partner was 1.62 years older than the female participant. Thirty-eight percent of the participants were the same age in years as their partners. Forty-one percent of the male partners were identified as Caucasian or White, 16% were identified as Japanese, and the remaining groups were each identified by less than 10% of the participants. Two participants did not identify their partners’ ethnicities. Forty-eight of 86 (55%) participants reported that their partners were of the same ethnicity as they are; one participant did not identify the ethnicities for both herself and her partner. Seventy-one of 87 (82%) participants reported their partners were of the same residency status as they are.
Table 2.

*Study Sample Characteristics by Primary Ethnicity Identification (N = 82)*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian or White a</td>
<td>27 (31.0)</td>
</tr>
<tr>
<td>Japanese</td>
<td>22 (25.3)</td>
</tr>
<tr>
<td>Filipino</td>
<td>7 (8.0)</td>
</tr>
<tr>
<td>Chinese</td>
<td>6 (6.9)</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>6 (6.9)</td>
</tr>
<tr>
<td>Korean</td>
<td>4 (4.6)</td>
</tr>
<tr>
<td>Hapa b</td>
<td>4 (4.6)</td>
</tr>
<tr>
<td>Other Hispanic or Latino</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>Portuguese</td>
<td>2 (2.3)</td>
</tr>
<tr>
<td>Mexican</td>
<td>1 (1.1)</td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>1 (1.1)</td>
</tr>
</tbody>
</table>

a. In surveys used by the state of Hawai‘i, the category “Caucasian” does not include Portuguese for historical reasons; Portuguese is considered a separate category for demographic information reporting purposes in the state of Hawai‘i.

b. “Hapa” is a Hawaiian term that is used to refer to a person with “mixed ethnicity;” some participants reported this despite being asked to identify a primary ethnic identification.
Attitudes toward pregnancy. At Time 1, 78% of the participants reported that they would feel “very negative” or “somewhat negative” if they were to become pregnant right then and 81% of the participants believed it was “very important” or “extremely important” to not get pregnant right then. At Time 2, 77% reported that they would feel “very negative” or “somewhat negative” and 89% of the participants believed it was “very important” or “extremely important” to not get pregnant right then. At Time 1, 10% of the participants reported that they would feel “somewhat positive” if they were to become pregnant right then, no one reported that they would feel “very positive” and 2% reported that it was “not important at all” to not get pregnant right then. At Time 2, 10% of the participants reported they would feel “somewhat positive” or “very positive” if they were to become pregnant right then and 1% reported they felt it was “not important at all” to not get pregnant right then.

Oral contraceptive medication use. The average length of time that the participants had used oral contraceptive medication was 3.9 years (range = less than 1 – 20 years, median = 3 years, modes = “less than 1” and “2 years”); one person did not respond to this question. The most common place to obtain contraceptive medication was the pharmacy or drug store (41%), followed by a medical doctor’s office (24.1%). Qualitative data suggested some respondents were confused as to whether this question referred to the obtaining of the prescription or the medication itself and thus this result needs to be interpreted cautiously. Across participants, 31 brands of oral contraceptive medication were reported; 9 participants did not know the brand that they were using. The most popular was Lutera® (containing Ethinyl Estradiol, Levonorgestrel), which was prescribed to 11 participants in this sample. Only two participants reported they took progestin-only formulations (“mini-pills”). The percentages of participants who took and did not take their inactive pills were similar (47% and 44% respectively). The majority (58%) of the participants reported
that they alone made the decision to use the pill to prevent pregnancy; the next most common response was “my partner and I” (38%).

Self-reported medication adherence. Sixty-one percent and 62% of the participants, at Time 1 and at Time 2 respectively, reported perfect medication adherence in the past month (i.e., missed 0 pills); 45% of the sample reported perfect adherence over a two-month period. The number of days of missed pills reported at Time 1 was between 0 and 5 days ($M = 0.70, SD = 1.1$) and the number of days of missed pills reported at Time 2 was between 0 and 4 days ($M = 0.54, SD = 0.90$; Table 3). The most common reason for missing a pill was “forgot to take the pill,” reported by 36% respondents at Time 1 and 31% at Time 2. At Time 1, the majority (86%) of the respondents reported that they took their pills at the same time each day “most of the time” or “all the time;” and at Time 2, 72% reported “most of the time” or “all the time.” Thirteen of the 14 people who offered an explanation as to what they did with the missed pills said that they took their missed pill as soon as they remembered it, as instructed by their physicians, and one person who reported missing several consecutive days began a new package as instructed by her physician.
Table 3.

<table>
<thead>
<tr>
<th>Number of pills</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Missed</td>
<td>N (87)</td>
<td>%</td>
<td>N (83)</td>
<td>%</td>
</tr>
<tr>
<td>0</td>
<td>53</td>
<td>60.9</td>
<td>54</td>
<td>65.1</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>16.5</td>
<td>18</td>
<td>21.7</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>11.5</td>
<td>8</td>
<td>9.6</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>5.7</td>
<td>1</td>
<td>1.2</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.1</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1.1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Partner support in the use of oral contraceptive medication. The majority (87%) of the respondents reported that their partners were “very in favor” or “extremely in favor” of their use of oral contraceptive medication. One person reported that the male partner did not know about her pill use and five people reported that they did not know how their partners felt about their pill use. The majority (66%) of the participants reported that their partners provided them with some form of tangible support in their use of the oral contraceptive medications. Of these participants, 72% reported that “he reminds me to take the pill,” 25% reported that “he goes to the pharmacy or the doctor’s office with me,” 12% reported that “he pays for the pill,” 11% reported that “he helps me with the pills side effects,” 4% reported that “he picks up the pill for me,” and 3.5% reported that “he helps me with other things.” These percentages totaled more than 100% because participants could choose more than one response.
Use of other types of contraceptive methods. At Time 1, 20% of the participants reported that they use another form of birth control in addition to taking oral contraceptive medications “most of the time” or “all of the time” (i.e., dual-method users); at Time 2, 17% of the participants reported they were using more than one contraceptive method “most of the time” or “all of the time.” At Time 1, 8% of the participants reported that they used a “back-up” birth control method when they missed taking their pills “most of the time” or “all of the time” in the last month; at Time 2, 9% of the participants reported they were using a “back-up” method “most of the time” or “all of the time.” The most common “back-up method” reported at Time 1 was abstinence reported by 8% of the respondents; at Time 2, male condom was most common reported method reported by 10% of the respondents.

Sexual activities. Fifty-four percent of the respondents at Time 1 and 41% of the respondents at Time 2 reported that they engaged in sexual intercourse with their partners more than twice a week during the last month. One participant at Time 1 and two participants at Time 2 reported engaging in sexual intercourse outside of her self-identified monogamous relationship.

Accurately guessing the purpose of the study. According to qualitative data gathered at the end of the study about the participants’ experiences with the study, 70 out 83 (84%) participants who returned for follow-up did not guess that the study’s true purpose was to assess medication adherence of oral contraceptive medication.

Means and Standard Deviations for Dependent and Independent Variables at Two Time Points

Table 4 presents the means and standard deviations for dependent and independent variables at two times points.
### Table 4.

*Means and Standard Deviations for Variables at Two Times Points*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1 (n = 87)</th>
<th></th>
<th>Time 2 (n = 83)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationship Assessment Scale (RAS) a</td>
<td>4.3</td>
<td>0.6</td>
<td>4.3</td>
<td>0.6</td>
</tr>
<tr>
<td>Investment Model Scale: Subscales (IMS) b</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td>6.6</td>
<td>1.2</td>
<td>6.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Commitment Level</td>
<td>7.0</td>
<td>1.3</td>
<td>6.9</td>
<td>1.3</td>
</tr>
<tr>
<td>Attitudes toward pregnancy</td>
<td>3.3</td>
<td>1.5</td>
<td>3.1</td>
<td>1.6</td>
</tr>
<tr>
<td>Number of Days of Missed Pills Last Month</td>
<td>0.7</td>
<td>1.1</td>
<td>0.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Length of Relationship (in months)</td>
<td>29.7</td>
<td>34.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Oral Contraceptive Pill Use (in years)</td>
<td>3.9</td>
<td>3.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^a RAS items were rated on a 5-point Likert scale from 1 “low satisfaction” to 5 “high satisfaction.”  
^b IMS items were rated from 0 “do not agree at all” to 8 “agree completely.”  
^c Attitudes toward pregnancy was calculated by taking the average of the scores from two questions: 1) “How would you describe the emotions that you would feel if you were to become pregnant right now?” rated from 1 to 5, 1 “very negative,” 2 “somewhat negative,” 3 “neither negative nor positive,” 4 “somewhat positive,” and 5 “very positive,” and 2) “Considering only yourself, how important is it not to get pregnant right now?” rated from 1 to 5 with reverse scoring, 1 “not important at all,” 2 “a little important,” 3 “somewhat important,” 4 “very important,” and 5 “extremely important.”
Pearson’s Correlations between Independent and Dependent Variables

Table 5 presents the Pearson product-moment correlation coefficients for the independent and dependent (medication adherence) variables. Relationship Satisfaction at Time 1 was significantly positively correlated with Investment Model Scale - Commitment Level subscale at Time 1 \( r(87) = .58, p < .01 \) and at Time 2 \( r(83) = .38, p < .01 \). Relationship Satisfaction at Time 2 was significantly positively correlated with Investment Model Scale - Commitment Level subscale at Time 1 \( r(87) = .56, p < .01 \) and at Time 2 \( r(83) = .71, p < .01 \). The relationship satisfaction measure was not significantly correlated with attitudes toward pregnancy or self-reported medication adherence. None of the measures of predictor variables (relationship satisfaction, attitudes toward pregnancy, and relationship commitment) was significantly correlated with self-reported medication adherence. Additional analyses confirmed that two questions forming the composite of “attitudes toward pregnancy” measure were not individually statistically correlated with self-reported medication adherence (not shown). After omitting 18 participants who accurately guessed the purpose of the study, and statistical analyses discussed above were conducted again and there was no significant correlation found between self-reported medication adherence and predictor variables (Table 6).
### Table 5

*Pearson Product-Moment Correlation Coefficients among Independent and Dependent Variables*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship Satisfaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Time 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>--</td>
<td>.80**</td>
<td>.29**</td>
<td>.61**</td>
<td>.45**</td>
<td>.12</td>
<td>.00</td>
<td>-.18</td>
<td>-.10</td>
</tr>
<tr>
<td>2. Time 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>--</td>
<td>-.35**</td>
<td>.61**</td>
<td>.73**</td>
<td>.03</td>
<td>.03</td>
<td>-.16</td>
<td>-.03</td>
<td></td>
</tr>
<tr>
<td>3. Difference Score</td>
<td>--</td>
<td>-.01</td>
<td>.47**</td>
<td>.12</td>
<td>-.04</td>
<td>-.02</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commitment Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Time 1</td>
<td>--</td>
<td>.68**</td>
<td>-.03</td>
<td>-.05</td>
<td>-.04</td>
<td>-.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Time 2</td>
<td>--</td>
<td>-.06</td>
<td>-.01</td>
<td>-.07</td>
<td>-.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attitudes toward Pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Time 1</td>
<td>--</td>
<td>.84**</td>
<td>-.02</td>
<td>-.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Time 2</td>
<td>--</td>
<td>-.03</td>
<td>-.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reported Number of Days of Missed Pills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Time 1</td>
<td>--</td>
<td>.29*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Time 2</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Time 1 N = 87; <sup>b</sup> Time 2 N = 83

* p < .05, ** p < .01, 2-tailed
Table 6

*Pearson Product-Moment Correlation Coefficients between Independent and Dependent Variables (after eliminating participants who accurately guessed the purpose of the study)*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relationship Satisfaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Time 1 (^a)</td>
<td>--</td>
<td>.77**</td>
<td>.34**</td>
<td>.58**</td>
<td>.38**</td>
<td>.11</td>
<td>.02</td>
<td>-.13</td>
<td>-.05</td>
</tr>
<tr>
<td>2. Time 2 (^a)</td>
<td>--</td>
<td>-.34**</td>
<td>.56**</td>
<td>.71**</td>
<td>.01</td>
<td>.03</td>
<td>-.11</td>
<td>-.02</td>
<td></td>
</tr>
<tr>
<td>3. Difference Score</td>
<td>--</td>
<td>-.03</td>
<td>.49**</td>
<td>.18</td>
<td>-.01</td>
<td>-.02</td>
<td>-.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Commitment Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Time 1</td>
<td>--</td>
<td>.60**</td>
<td>-.04</td>
<td>-.02</td>
<td>-.03</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Time 2</td>
<td>--</td>
<td>-.10</td>
<td>-.00</td>
<td>-.03</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attitudes toward Pregnancy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Time 1</td>
<td>--</td>
<td>.82**</td>
<td>-.04</td>
<td>-.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Time 2</td>
<td>--</td>
<td>-.03</td>
<td>-.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reported Number of Days of Missed Pills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Time 1</td>
<td>--</td>
<td>.27*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) N = 70

\(* p < .05, ** p < .01, 2-tailed*)
Additional Pearson’s Correlations among Length of Relationship and Medication Adherence and Demographic Variables

The means and standard deviations for the measures used in the following analyses are presented in Table 7.
Table 7.

*Mean Number of Days of Missed Pills Last Month by Demographic Variable and Time Point*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate in Guessing of Study’s Purpose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>70</td>
<td>0.71</td>
<td>1.10</td>
<td>-0.19</td>
<td>81</td>
<td>0.85</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td></td>
<td>0.77</td>
<td>1.01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>70</td>
<td>0.60</td>
<td>0.95</td>
<td>1.36</td>
<td>81</td>
<td>0.18</td>
</tr>
<tr>
<td>No</td>
<td>13</td>
<td></td>
<td>0.23</td>
<td>0.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matching Participant and Partner’s Ethnicities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>38</td>
<td>0.64</td>
<td>0.98</td>
<td>-0.39</td>
<td>85</td>
<td>0.70</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td></td>
<td>0.73</td>
<td>1.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>38</td>
<td>0.58</td>
<td>0.98</td>
<td>0.34</td>
<td>81</td>
<td>0.73</td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td></td>
<td>0.51</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 7 (Continued)

*Mean Number of Days of Missed Pills Last Month by Demographic Variable and Time Point*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>Sig  (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Married or Engaged</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>9</td>
<td>.89</td>
<td>1.05</td>
<td>.54</td>
<td>85</td>
<td>.57</td>
</tr>
<tr>
<td>No</td>
<td>78</td>
<td>.67</td>
<td>1.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>9</td>
<td>.56</td>
<td>.73</td>
<td>.05</td>
<td>81</td>
<td>.96</td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>.54</td>
<td>.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cohabiting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>33</td>
<td>.58</td>
<td>.83</td>
<td>-.82</td>
<td>85</td>
<td>.41</td>
</tr>
<tr>
<td>No</td>
<td>54</td>
<td>.77</td>
<td>1.18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>32</td>
<td>.50</td>
<td>.92</td>
<td>-.34</td>
<td>81</td>
<td>.74</td>
</tr>
<tr>
<td>No</td>
<td>51</td>
<td>.57</td>
<td>.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Receives tangible partner support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>57</td>
<td>.58</td>
<td>1.02</td>
<td>-1.42</td>
<td>85</td>
<td>.16</td>
</tr>
<tr>
<td>No</td>
<td>30</td>
<td>.92</td>
<td>1.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>55</td>
<td>.44</td>
<td>.88</td>
<td>-1.51</td>
<td>81</td>
<td>.13</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>.75</td>
<td>.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
To determine whether the mean number days of missed pills in the past month differed among participants who differed on several demographic variables, a series of independent samples t-test were performed with Time 1 and Time 2 reported number of days of missed pills and demographic variables of ethnicity match, marital status, living arrangement, and provision of tangible support by partner.

The next set of analyses examined whether there were significant differences in self-reported number of missed pills at Time 1 and 2 between: a) participants who reported that they and their partners had, or did not have, the same primary ethnicity, b) participants who reported they were, or were not, married, c) participants who reported they were, or were not, cohabiting, and d) participants who reported their partners did, or did not, provide tangible support in the participants’ use of oral contraceptive medications. Results from separate independent samples t-test analyses indicated that there was no significant difference in the reported number of pills missed among participants who differed on these other variables at either time points.

To explore whether there was a relation between medication adherence and the number of years that the participants reported using oral contraceptive medication, a Pearson’s product-moment correlation coefficient was calculated and the results showed that there was no significant relation between the two variables (means and standard deviations of the measures were presented in Table 6).

An independent samples t-test was performed to examine whether there was a significant difference in self-reported medication adherence at Time 2 between those who accurately guessed the purpose of the study and those who did not. Those who accurately guessed the purpose of the study reported significantly fewer number of days of missed pills at Time 2 ($t(37.35) = 2.22, p = 0.03$) than those who
did not accurately guess the purpose ($M = 0.23, SD = 0.44; M = 0.60, SD = 0.95$, respectively; see Table 7).

**Interactive Effects of Relationship Satisfaction, Attitudes toward Pregnancy, and Relationship Commitment on Oral Contraceptive Medication Adherence**

Before seeing if there were interactive effects of relationship satisfaction, attitudes toward pregnancy, and relationship commitment on oral contraceptive medication adherence, we need to first determine if there is statistically significant bivariate correlation among these variables.

Pearson’s product-moment correlation coefficient calculations were used to examine the relation between each independent variable at each time point and the oral contraceptive medication adherence at Time 2. The analyses demonstrated no significant correlation between any of the independent variables at Time 1 and Time 2 and oral contraceptive medication adherence at Time 2. The analyses also showed no significant correlation between the change between Time 1 and Time 2 in each independent variable and oral contraceptive medication adherence at Time 2.

Because each independent variable was not significantly correlated with the dependent variable, the mediating and moderating effects of each independent variable on the dependent variable were not tested, as such analyses were predicated upon a significant correlation between the variables.

In examining the amount of variance in oral contraceptive medication adherence that could be accounted for by the various predictor variables, multiple regression analysis was used to examine the variances in self-reported medication adherence at Time 2 ($Y$) that may be accounted for by relationship satisfaction at Time 1 ($\beta_1X_1$) and Time 2 ($\beta_2X_2$), attitudes toward pregnancy at Time 1 ($\beta_3X_3$) and Time 2 ($\beta_4X_4$), and relationship commitment level at Time 1 ($\beta_5X_5$) and Time 2
(β₆X₆). The model’s formula may be characterized as:

\[ Y = \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + e \] (Table 7).

Table 8.

**Regression Analysis Examining the Variance in Self-Reported Medication at Time 2 Accounted for by Relationship Satisfaction, Attitudes Toward Pregnancy, and Relationship Commitment at Time 1 and Time 2**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>R²</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Adherence Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>.06</td>
<td>.76</td>
<td>.60</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitudes toward Pregnancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship Satisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This model did not significantly explain the variance in self-reported medication adherence at Time 2. Difference scores between Relationship Satisfaction at Time 1 and Time 2 were not included in the model because the difference scores were highly correlated with Relationship Satisfaction. The model accounted for a non-significant portion of the variance in medication adherence ($R^2 = .06$).
CHAPTER IV. DISCUSSION

The goals of this study were to provide information on the degree to which oral contraceptive medication adherence among college females who were involved in heterosexual, monogamous, and sexual relationships was associated with:

a) relationship satisfaction, attitudes toward pregnancy, and relationship commitment, and b) the interactive effects among relationship satisfaction, attitudes toward pregnancy, and relationship commitment.

The findings from this study indicated: a) no significant relation among relationship satisfaction, attitudes toward pregnancy, relationship commitment, and oral contraceptive medication adherence, b) 45% of the sample reported perfect oral contraceptive medication adherence over a two-month period, and c) the pill count method of oral contraceptive medication adherence found no variance across participants; all pill counts indicated 100% adherence. There were no significant differences in self-reported and pill-count measures of oral contraceptive medication adherence between a) those participants who shared the same ethnicity as their partners and those participants who did not share the same ethnicity as their partners, b) those participants who were married or engaged to their partners and those who were not, c) those participants who cohabited with their partners and those who did not, and d) those participants who received tangible partner support and those who did not.

The results from this study were consistent with those from Hughey and colleagues (2010) and Gilliam and colleagues (2010) with respect to oral contraceptive medication adherence among college females. At the time of this writing, these two articles remain the sole articles published regarding oral contraceptive medication adherence among college females.
However, the results from this study were inconsistent with the results from other studies (Ford et al., 2001; Frost & Durroch, 2008; Kern et al., 2003; Kraft et al., 2010; Kusunoki & Upchurch, 2011; Manlove et al., 2011) on relationship factors and contraceptive use, in that the current study found no significant relation between oral contraceptive medication adherence and the relationship factors examined. The differences in outcome between this and previous studies could be attributable to:

a) homogenous sample of college students in the current study, b) different demographic characteristics of the samples, c) differences across studies in the way that relationship factors were measured, d) differing durations of the studies, e) only one type of contraceptive method was examined in this study, and f) the requirement of participants in this study to commit to two study sessions involving questionnaires and bringing in oral contraceptive medication package.

This study included college females who were involved in heterosexual, monogamous, and sexual relationships and taking oral contraceptive medication for the purpose of preventing pregnancy. While focusing the study on a homogenous sample reduced possible confounding variables, such as the effect of education level on the adherence to any contraceptive method, one of the limitations of focusing on a homogenous sample is that the study results may not be generalizable to those who are not attending college, those who are not involved in monogamous relationships, and those who are not taking oral contraceptive medication for the purpose of preventing pregnancy.

Many previous studies that examined relationship factors and contraceptive method use focused on adolescents (e.g., Manlove et al., 2011; Manning et al., 2009). It is not possible from the current study to identify the reasons why oral contraceptive medication adherence in this sample of college students was different
from contraceptive adherence rates of adolescents found in previous research. However, there are several possibilities: a) parental involvement and attitudes toward sexuality may influence adolescents’ decision-making regarding contraceptive use (de Graaf, Vanwesenbeeck, Woertman, & Meeus, 2011), b) adolescents may behave more impulsively and be less cognizant of long term consequences of risky behaviors, as the cortical areas of their brain involved in decision-making are still developing (Blakemore & Robbins, 2012; Fair et al., 2013), and c) there is a significant positive correlation between education level and the probability of using any type of contraceptive method (Manning et al., 2011).

The different methods of assessment may explain some of the differences between the results from this study and that from previous studies on the relation between relationship factors and contraceptive method adherence. This study used previously validated measures of relationship satisfaction and relationship commitment that had also been used in research with other college populations (e.g., Hendrick, 1988; Rusbult et al., 1998) and used questions regarding attitudes toward pregnancy that had been used in studies by Kern and colleagues (2003) and Kraft and colleagues (2010). Given that relationship satisfaction, attitudes toward pregnancy, and relationship commitment are complex constructs, the assessment instruments used in this study may not have assessed all aspects of the constructs, such as the extent to which the woman takes her partner’s attitudes toward pregnancy into consideration when making her contraception decisions. For oral contraceptive medication adherence, this study used two methods of measurement: a) directly observing and counting the number of pills taken that month from medication package brought in by the participants, and b) self-reported number of pills missed that month. Most studies of relationship factors and the participants’ use
of contraceptive methods are based on self-reported information (e.g., Gilliam et al., 2010; Manlove et al., 2010; Manning et al., 2009).

This study took place over a one-month period and was limited to collecting self-reported data from two menstrual cycles. Studies for longer periods of time might allow for the analysis of month-to-month trends in medication adherence. For example, Potter and colleagues (1996) studied three menstrual cycles using electronic monitoring and found that the number of missed pills increased over time. This may due to the decrease in reactive effects of the measurement strategies over time (Haynes, 2006).

In this study, only one type of contraceptive method was examined in contrast to other studies that included various types of contraceptive methods (e.g., Frost et al., 2008; Kraft et al., 2010; Manning et al., 2009). Contraceptive methods differ in their time of application, method and ease of use, ability to reduce the risk of contracting STI, financial cost, the sex of the partner that the method is designed for, and effectiveness for preventing pregnancy. Any of the aforementioned factors could influence the use of contraceptive methods.

This study required the participants to commit to two assessment sessions where they were required to make appointments to visit the laboratory to complete sets of questionnaires and to bring in oral contraceptive medication package. This was more time-consuming than the procedures of some other studies (e.g., Hughey et al., 2010). This time commitment on the part of the participants may have discouraged some interested people from participating in the study. Those who self-selected to participate in the study might have personal attributes, such as high motivation and conscientiousness, that could account for some of the study’s results.
Future Directions

This study provides the impetus for research in several directions. First, more research is necessary to establish gold standards for measuring oral contraceptive medication adherence to facilitate the comparison of results across research studies. Second, memory-related deficits in oral contraceptive medication adherence will be important to explore because, in this study, the participants indicated that the most common reason for medication non-adherence was forgetting to take the pill. There is emerging literature that suggests prospective memory is an important aspect of medication adherence. Prospective memory is the cognitive capacity to form, maintain, and recall an intention to be executed at some point in the future based on a specific cue, such as taking oral contraceptive medication after brushing one’s teeth in the morning. Prospective memory-based interventions to improve medication adherence may warrant further research (Zogg, Woods, Saucedo, Wiebe, & Simoni, 2012). More research on the effectiveness of cognitive strategies and memory aids on oral contraceptive medication adherence are also needed.

While this study found no statistically significant relation among relationship satisfaction, relationship commitment level, and self-reported oral contraceptive medication adherence, there may be other relationship factors that are worth exploring in conjunction with oral contraceptive medication adherence, such as the effectiveness of dyadic communication.

Moreover, relationship factors may affect medication adherence in other populations, such as patients in same-sex relationships who are taking HIV anti-viral medication (Johnston et al., 2010).
Appendix A

Annotated Bibliography of Studies with Oral Contraceptive Use among Young People

<table>
<thead>
<tr>
<th>Study</th>
<th>N, Sex, Age</th>
<th>Contraception Methods Studied</th>
<th>Constructs of Interest</th>
<th>Research Method</th>
<th>Group Examined</th>
<th>Relevant Findings</th>
</tr>
</thead>
</table>
| Kern et al, 2003  | 213, F, 13-46 (M = 22.4), 88% Hispanic, 57% completed high school | Oral contraceptive med | Characteristics of females who discontinue meds after one month | Interviews (baseline, 6 weeks follow-up), self-report | Oral contraceptive med users; primarily Dominican females | • Women whose partners did not know about the med usage were over three times more likely to discontinue the med before the second package when compared to those women with partners knew about the med usage (aOR 3.34; 95% CI 1.66-7.09, \( p \leq .001 \))
  • Women who reported they would be happy if they were to become pregnant in the next six months were about 2.3 times more likely to discontinue the med before the second package than those women who reported they would be unhappy (aOR 2.36; 95% CI 1.14-4.88; \( p \leq .05 \)). |
<table>
<thead>
<tr>
<th>Study</th>
<th>N, Sex, Age</th>
<th>Contraception Methods Studied</th>
<th>Constructs of Interest</th>
<th>Research Method</th>
<th>Group Examined</th>
<th>Relevant Findings</th>
</tr>
</thead>
</table>
| Gilliam et al, 2010         | 273, F, 18-38 (M = 22), 50% non-Hispanic Caucasian, college females | Oral contraceptive med and vaginal ring | Adherence and satisfaction with contraceptive method at 3 months, 6 months follow-up | Random Control Trial, daily diary, self-report | Oral contraceptive med users, vaginal ring users | • Vaginal ring users reported more perfect use over a 3-month period than oral contraceptive med users ($p$ for difference = .05)  
• Two group’s adherence rates differed in first 2 months but not in the 3rd month ($p$ for difference = .03 and .05 respectively); by 6 months, most people have discontinued use (n.s. for difference between groups) |
<p>| Hughey et al, 2010 a        | 112, F, 18-? (M = 21), 47% non-Hispanic Caucasian, college females | Oral contraceptive med | Factors associated with contraceptive method non-adherence | Random Control Trial, Internet daily diary, self-report | Oral contraceptive med users                             | • In the multivariate model, women had high stress level OR, 3.16; 95% CI, 1.38-7.26; $p$ = .007), and were living with partners (OR 9.92; 95% CI, 1.11-88.98; $p$ =.040).were less likely to be adherent to oral contraceptive meds |</p>
<table>
<thead>
<tr>
<th>Study</th>
<th>N, Sex, Age</th>
<th>Contraception Methods Studied</th>
<th>Constructs of Interest</th>
<th>Research Method</th>
<th>Group Examined</th>
<th>Relevant Findings</th>
</tr>
</thead>
</table>
| Kraft et al, 2010 | 435 pairs of M and F, 18-25 (F age), 50% Latina and 50% Caucasian, 50% with college degree | Mixed methods; “effective” method was defined as a contraceptive method that had less than 10% failure rate, when used consistently | Overlap between reported pregnancy motivation by males and females in a dyad and contraceptive method use among females | Archival (PARTNERS study, 1999-2002), self-report | Males and females who are in romantic relationships | • Women who were in sexual relationship with their partners for more than 2 yrs were almost 2 times as likely as those who were involved for < 1 yr to use any “effective” contraceptive method (aOR 1.98, 95% CI 1.16-3.36; p < .05)  
• Women who reported they would not desire to have a child with their partner in the next 2 years were almost 2 times as likely as those desired a child to use any type of effective contraceptive method (aOR 1.73; 95% CI 1.04-2.88; p < .05) |
### Appendix A (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>N, Sex, Age</th>
<th>Contraception Methods Studied</th>
<th>Constructs of Interest</th>
<th>Research Method</th>
<th>Group Examined</th>
<th>Relevant Findings</th>
</tr>
</thead>
</table>
| Manlove et al, 2011 | 8984 Males and Females, 18-26 | Condom, hormonal, or dual method | Relationship factors affecting contraceptive use in males and females                  | Archival (1997 cohort of National Longitudinal Survey of Youth, 2002-2005 data), self-report | Condom, hormonal method, dual method          | - Women who reported that they have discussed co-habitation or marriage with their partners were less likely to use any contraceptive methods (OR 0.69; \( p < .001 \)); they were also more likely to use hormonal methods than a condom during the last sexual encounter (OR 1.59; \( p < .001 \))  
- Women rated higher feelings of closeness to their partners and higher perceived care from their partners were more likely to use hormonal methods during the last sexual encounter (OR 1.08; \( p < .01 \))  |

\(^a\) Hughey and colleague’s sample (2010) was a subset of Gilliam and colleague’s sample (2010)
Appendix B

Screening Questions

Today’s Date: _______________

1. Are you a student at the UH at Mānoa? ☐ YES ☐ NO
2. Are you in a heterosexual relationship? (i.e., female-male relationship) ☐ YES ☐ NO
3. Are you in a monogamous relationship? (i.e., with only one person) ☐ YES ☐ NO
4. Are you sexually active in your relationship? ☐ YES ☐ NO
5. Do you use an oral contraceptive medication for the purpose of preventing pregnancy? ☐ YES ☐ NO
6. Are you willing to commit to the study for one month, which includes two meetings (approximately 30 minutes each) with a research assistant? ☐ YES ☐ NO
7. Are you pregnant? ☐ YES ☐ NO ☐ I DON’T KNOW

If you are eligible to participate in this study, you will be contacted by a research assistant regarding an appointment. For your participation in this study, we would like to thank you by offering you a $5 gift card to Jamba Juice, Starbucks, or Subway.

If you are not eligible to participate in this study, this screening questionnaire will be destroyed.

First name: _______________________
Email address: ____________________ ☐ I prefer this method of contact
Telephone number: ________________ ☐ I prefer this method of contact

Thank you!!
Thank you for your interest in the “Relationship and Wellness Study.” Please take the time to review this consent form and discuss any questions you may have with the research assistant. If you agree to participate, you will be asked to sign this form.

Purpose of the Study
This study is being conducted as part of the investigator’s doctoral dissertation research. The purpose of this study is to examine relationship factors among college females who are involved in heterosexual, monogamous, sexual relationships and taking oral contraceptive medication for the purpose of preventing pregnancy. The duration of your participation will be one menstrual cycle.

Procedures
If you agree to participate, you will come to the laboratory twice, once at the beginning and once at the end of your menstrual cycle, in order to complete some questionnaires about yourself, your partner, your relationship, use of oral contraceptive medication, start date of your last menstrual period, pregnancy history, and sexual activities. Each session will take about 30 minutes. Aside from completing questionnaires, a research assistant will also ask to see your oral contraceptive medication blister package and container from the most recent month. Lastly, we request that you leave your contact information to allow us to remind you of your appointments. You will be offered a $5 gift certificate to Jamba Juice, Starbucks, or Subway for your participation in this study.
**Potential Risks and Discomforts**
You may potentially feel some discomfort during the disclosure of details regarding your relationship and sexual activities. The research assistants are trained to keep information strictly confidential. In the case that you are experiencing psychological distress, please notify our research assistant. Other supports by mental health professionals are available to the participants should they be required.

**Potential Benefits**
Most of the possible benefits of participating in this study are not immediate and direct to you but results may help inform clinicians who are counseling college females who are involved in sexual relationships. You will be offered an opportunity to leave your contact information to receive a copy of the study results at the conclusion of the study.

**Confidentiality**
Your personal information will only be shared among the research staff. Your information is protected to the extent allowed by state and federal laws. A personalized code, which will be known only to study personnel, will be used instead of your name on the data collected. All records, such as this consent form, identifiable to you, will be stored in a secure locked file in the primary investigators’ office for the duration of the study and be destroyed at the conclusion of the study. No personal information will be part of any paper or publication based on this study. Agencies with research oversight, such as the University of Hawai‘i (UH) Committee on Human Studies, have the authority to review research data.

**Participation and Withdrawal**
Your participation is voluntary. If you decide to participate in this study, you may choose to withdraw from this study at any time by contacting the investigator.
If you have any questions regarding this research project, please contact the primary investigator Susan Lin at susanlin@hawaii.edu. You may also contact her supervisor Dr. Stephen Haynes at sneil@hawaii.edu.

If you have any questions regarding your rights as a research participant, please contact the UH Committee on Human Studies at (808) 956-5007, or uhirb@hawaii.edu.

☐ I have been offered a copy of this consent form.

_______________________________
Name of Participant (printed)

______________________________    __________________
Signature of Participant       Date
Appendix D

Future Contact Form

Today’s Date: _______________

We would like to request that you leave your email and telephone number with us so that we may email or call you to remind you of your next session. Your contact information will be kept separately from your research data and will be destroyed at the completion of this study. Thank you.

First name: ___________________________________________
Email: __________________________________________
Telephone number: ________________________________
Best time to reach you: _____________________________

Preferred method

Preferred method
Appendix E

Cover Story for Pill Count

You have indicated during our last session the type of birth control medication you are taking. But since birth control medications come in different packaging designs, I would like to take a look at your package, and then you can take it home with you. Please bring in the package that you have been using this month, so that I have an exact idea of what you have been using this month. Don’t worry if there are any pills left over in the package, please just bring the package in as it is on the day of our meeting.
Appendix F

Debriefing Questions

Today’s Date: _______________       Study ID #: □□□□□□□□□□□

The research assistant will administer following questions and record participant’s responses.

1. What do you think this study is about?

2. On a scale of 0 to 5, 0 being “very uncomfortable” to 5 being “very comfortable”, how comfortable were you in answering our questionnaires?

3. On a scale of 0 to 5, 0 being “very uncomfortable” to 5 being “very comfortable”, how comfortable were you in showing me your medication package?

4. Do you have some idea as to why I asked to see your medication package?
Appendix G

Debriefing Form

Thank you for your time and participation in this research study. The purpose of this study is to understand the connections between relationship satisfaction, pregnancy intention, relationship commitment level, and birth control medication adherence. “Medication adherence” means how closely you follow your doctor’s instructions about taking medications. In this case, we wanted to see how well you follow your doctor’s instruction about taking your birth control medications.

The reason that we did not tell you the study’s specific purpose at the beginning of the study was because we did not want to influence the way you respond to these questionnaires. We asked to see your medication package to help us estimate how many pills you have taken this month. We did not tell you this because we did not want to affect the way you took your medication. We hope this did not cause you any distress; and if it did, please speak to our research assistant about your concerns.

All of your data are going to be kept in a secured file with a password that only the research team can access. Your responses are identified only by your 8-digit code, without you name or any identifying information. Your contact information will be destroyed at the end of the study. We use the data to calculate statistics to better understand college females as a group and no individual’s responses are singled out.

We hope that the results will help clinicians understand their patients better and will help clinicians help their patients take their medications better. To make sure this study is carried out in the same way for every participant, we ask that you do not tell your friends about the study’s purpose and what we are trying to study, in case they would like to participate in the study.
If you are interested in the results, you can leave your contact information with us, and we can send a copy of the study summary to you when we have the results.

Given this new information, you have the option to withdraw from the study with no negative consequences to you. The data that has already been collected from you will be destroyed should you wish to withdraw from the study.

If you have any questions or concerns regarding this research project, please contact the primary investigator Susan Lin at (808) 206-3504 or susanlin@hawaii.edu. You may also contact her supervisor Dr. Stephen Haynes at sneil@hawaii.edu.
Appendix H

Relationship Assessment Scale

Today’s Date: _______________             Study ID #: □□□□□□□□□

Please mark the number which best answers that item for you, thinking about the past one month (30 days).

1. How well does your partner meet your needs?
   1 2 3 4 5
   Poorly Average Extremely Well

2. In general, how satisfied are you with your relationship?
   1 2 3 4 5
   Unsatisfied Average Extremely Satisfied

3. How good is your relationship compared to most?
   1 2 3 4 5
   Poor Average Excellent

4. How often do you wish you hadn’t gotten in this relationship?
   1 2 3 4 5
   Never Average Very Often

5. To what extent has your relationship met your original expectations:
   1 2 3 4 5
   Hardly At All Average Completely
6. How much do you love your partner?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Much</td>
<td>Average</td>
<td>Very Much</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. How many problems are there in your relationship?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Few</td>
<td>Average</td>
<td>Very Much</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Appendix I**

**Investment Model Scale**

Today’s Date: _______________          Study ID #: ☐☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐☐

**Satisfaction Level Facet and Global Items**

1. Please indicate the degree to which you agree with each of the following statements regarding your current relationship (circle an answer for each item).

<table>
<thead>
<tr>
<th>Don’t Agree At All</th>
<th>Agree Slightly</th>
<th>Agree Moderately</th>
<th>Agree Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) My partner fulfills my needs for intimacy (sharing personal thoughts, secrets, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>b) My partner fulfills my needs for companionship (doing things together, enjoying each other’s company, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>c) My partner fulfills my sexual needs (holding hands, kissing, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>d) My partner fulfills my needs for security (feeling trusting, comfortable in a stable relationship, etc.)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
e) My partner fulfills my needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I feel satisfied with our relationship (please circle a number).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My relationship is much better than others’ relationships.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. My relationship is close to ideal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Our relationship makes me very happy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Our relationship does a good job of fulfilling my needs for intimacy, companionship, etc.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Quality of Alternatives Facet and Global Items**

1. Please indicate the degree to which you agree with each statement regarding the fulfillment of each need in alternative relationships (e.g., by another dating partner, friends, family).

<table>
<thead>
<tr>
<th></th>
<th>Don’t Agree At All</th>
<th>Agree Slightly</th>
<th>Agree Moderately</th>
<th>Agree Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) My needs for intimacy (sharing personal thoughts, secrets, etc.) could be fulfilled in alternative relationships</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b) My needs for companionship (doing things together, enjoying each other’s company, etc.) could be fulfilled in alternative relationships</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c) My sexual needs (holding hands, kissing, etc.) could be fulfilled in alternative relationships</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
d) My needs for security (feeling trusting, comfortable in a stable relationship, etc.) could be fulfilled in alternative relationships

1 2 3 4

e) My needs for emotional involvement (feeling emotionally attached, feeling good when another feels good, etc.) could be fulfilled in alternative relationships

1 2 3 4

2. The people other than my partner with whom I might become involved are very appealing (please circle a number).

0 1 2 3 4 5 6 7 8

Do not agree at all Agree somewhat Agree completely

3. My alternatives to our relationship are close to ideal (dating another, spending time with friends or on my own, etc.).

0 1 2 3 4 5 6 7 8

Do not agree at all Agree somewhat Agree completely
4. If I weren’t dating my partner, I would do fine—I would find another appealing person to date.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. My alternatives are attractive to me (dating another, spending time with friends or on my own, etc.).

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. My needs for intimacy, companionship, etc., could easily be fulfilled in an alternative relationship.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Investment Size Facet and Global Items**

1. Please indicate the degree to which you agree with each of the following statements regarding your current relationship (circle an answer for each item).

<table>
<thead>
<tr>
<th></th>
<th>Don’t Agree At All</th>
<th>Agree Slightly</th>
<th>Agree Moderately</th>
<th>Agree Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) I have invested a great deal of time in our relationship</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b) I have told my partner many private things about myself (I disclosed secrets to him)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c) My partner and I have an intellectual life together that would be difficult to replace</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d) My sense of personal identity (who I am) is linked to my partner and our relationship</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e) My partner and I share many memories</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
2. I have put a great deal into our relationship that I would lose if the relationship were to end (please circle a number).

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Many aspects of my life have become linked to my partner (recreational activities, etc.), and I would lose all of this if we were to break up.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. I feel very involved in our relationship – like I have put a great deal into it.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. My relationships with friends and family members would be complicated if my partner and I were to break up (e.g., partner is friends with people I care about).

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Compared to other people I know, I have invested a great deal in my relationship with my partner.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Commitment Level Items**

1. I want our relationship to last for a long time (please circle a number).

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. I am committed to maintaining my relationship with my partner.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. I would not feel very upset if our relationship were to end in the near future.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not agree at all</td>
<td>Agree somewhat</td>
<td>Agree completely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. It is likely that I will date someone other than my partner within the next year.

0 1 2 3 4 5 6 7 8
Do not agree at all
Agree somewhat
Agree completely

5. I feel very attached to our relationship - very strongly linked to my partner.

0 1 2 3 4 5 6 7 8
Do not agree at all
Agree somewhat
Agree completely

6. I want our relationship to last forever.

0 1 2 3 4 5 6 7 8
Do not agree at all
Agree somewhat
Agree completely

7. I am oriented toward the long-term future of my relationship (for example, I imagine being with my partner several years from now).

0 1 2 3 4 5 6 7 8
Do not agree at all
Agree somewhat
Agree completely
Appendix J
Background Information Questionnaire

Today’s Date: _______________ Study ID #: □□□□□□□□**

**Please enter the last four digits of your UH school ID number followed by the four digits of the month and day of your birth date (MM/DD). This will create a unique 8-digit personal identification number for the purposes of identifying your responses in this study. All of your data will be identified by this number to protect your identity.

Section A.

1. Your age: _______ years

2. What ethnicity/ethnicities do you identify with? (You may check more than one)
   - [ ] Asian Indian
   - [ ] Chinese
   - [ ] Filipino
   - [ ] Japanese
   - [ ] Korean
   - [ ] Vietnamese
   - [ ] Other Asian
   - [ ] Alaska Native
   - [ ] American Indian
   - [ ] Black or African American
   - [ ] Caucasian or White
   - [ ] Portuguese

   Hispanic or Latino
   - [ ] Cuban
   - [ ] Mexican
   - [ ] Puerto Rican
   - [ ] Other Hispanic or Latino

   Other
   - [ ] Other
   - [ ] Adopted-don’t know
   - [ ] Do not know
   - [ ] Prefer not to answer

If you chose multiple ethnic backgrounds, which one do you primary identify with:

___________
3. Resident status:
☐ I am a resident of the state of Hawai‘i (i.e., I am a local student)
☐ I am a resident of a different state (i.e., I am an out-of-state student)
☐ I am a resident of another country (i.e., I am an international student)

The following questions ask about your relationship with your partner, with whom you currently share a heterosexual, monogamous, sexual relationship.

4. Thinking about your current partner, are you currently:
☐ Not married
☐ Engaged
☐ Married

5. Are you currently living with your partner (cohabiting)?
☐ Yes
☐ No

☞ IF No, have you and your partner discussed the possibility of living together (cohabiting)?
☐ Yes
☐ No

6. Your partner’s age: _____ years

7. What ethnicity/ethnicities does your partner identify with? (You may check more than one)

Asian
☐ Asian Indian
☐ Chinese
☐ Filipino
☐ Japanese
☐ Korean
☐ Vietnamese
☐ Other Asian

☐ Alaska Native
☐ American Indian
☐ Black or African American
☐ Caucasian or White
☐ Portuguese
Hispanic or Latino
☐ Cuban
☐ Mexican
☐ Puerto Rican
☐ Other Hispanic or Latino

Other
☐ Other
☐ Adopted-don’t know
☐ Do not know
☐ Prefer not to answer

Native Hawaiian & Other Pacific Islanders
☐ Hawaiian
☐ Chamorro
☐ Micronesian
☐ Samoan
☐ Other Pacific Islanders

If you chose multiple ethnic backgrounds, which one does he primary identify with:

________________________

8. Resident status:
☐ He is a resident of the state of Hawai‘i (i.e., He is a local student)
☐ He is a resident of a different state (i.e., He is an out-of-state student)
☐ He is a resident of another country (i.e., He is an international student)

9. How long have you been in a monogamous relationship with your partner? Please round to the nearest month (e.g., 3 months and 1 to 14 days = 3 months; 3 months and 15 or more days = 4 months). _______ year _______ months

10. During this past month, how often did you engage in sexual intercourse with your partner?
☐ None
☐ Once a month or less
☐ 2 or 3 times a month
☐ Approximately once a week
☐ 2 or 3 times a week
☐ More than 3 times a week
11. During the past menstrual cycle, have you engaged in sexual intercourse with someone else who is not your partner?
   □ Yes
   □ No
   □ Prefer not to answer

12. Are you currently pregnant?
   □ Yes
   □ No
   □ I don’t know

13. First day of your most recent menstrual period (Last Menstrual Period)?
   □ □/□□/□□□□ <MM/DD/YYYY>

14. On average, how long are your menstrual cycles? (Defined as the number of days between the start of your last menstrual period and the start of your next period)
   □ Mostly less than 28 days
   □ Mostly 28 days
   □ Mostly more than 28 days
   □ Cannot say, my menstrual cycles are irregular

15. How would you describe the emotions that you would feel if you were to become pregnant right now? (Please circle)

   1 - Very negative
   2 - Somewhat negative
   3 - Neither negative nor positive
   4 - Somewhat positive
   5 - Very positive
16. Considering only yourself, how important is it not to get pregnant right now?

1 - Not at all important
2 - A little important
3 - Somewhat important
4 - Very important
5 - Extremely important

17. During your lifetime, how many times have you been pregnant? (If you have not been pregnant, please enter 0.)

_____ time(s)

☐ I don’t know
☐ Prefer not to answer

➔ IF you have been pregnant, what were the outcomes of those pregnancies? Please specify using numbers. (The total numbers should add up to the number of times you have been pregnant.)

☐ Miscarriage (Spontaneous Abortion): _____ time(s)
☐ Medical Abortion: _____ time(s)
☐ Carried to term/given birth: _____ time(s)

☐ I don’t know
☐ Prefer not to answer

18. How many years have you used oral contraceptive medication (any brand)? (If less than one year, please write “less than 1”.)

_______ year(s)
19. Where do you get your oral contraceptive medication?
☐ UH Student Health Center
☐ Private physician’s office
☐ Drug store or pharmacy
☐ Planned Parenthood
☐ Mail Order
☐ Other: ______________
☐ Prefer not to answer

20. What brand of oral contraceptive medication (the pill) will you be taking this coming month? Please indicate by the number on the Medication List card.

Medication Number: _____ ☐ I don’t know

21. How many pills does your package contain?
☐ 21 ☐ 28 ☐ 91

22. Do you take your inactive pills?
☐ Yes ☐ Some of them ☐ No

23. During this past menstrual cycle, how many days did you miss taking your pill? (Please enter 0 if you did not miss any day.)

_______ days

☞ IF you did not take your pill for one or more days, what was/were the reason(s)? (You may check multiple)
☐ I forgot to take the pill
☐ I had side effects
☐ I did not want to take the pill
☐ My partner did not want me to take the pill
☐ I could not find my pill package
☐ I don’t know
☐ Other: ______________
24. During this past menstrual cycle, how frequently did you take your pill at the
same time of the day?
☐ None of the time
☐ Little of the time
☐ Some of the time
☐ Most of the time
☐ All the time

25. Who made the decision to use the pill to prevent pregnancy?
☐ Only me
☐ Only my partner
☐ My partner and I both
☐ Other: ________________

26. Is your partner in favor of you using the pill to prevent pregnancy?
☐ Not in favor
☐ A little in favor
☐ Somewhat in favor
☐ Very in favor
☐ Extremely in favor
☐ He does not know about my pill use
☐ I don’t know how he feels about my pill use

27. Does your partner help you with the pills in some way?
☐ He goes to the pharmacy/doctor’s office with me
☐ He picks up the pill for me
☐ He pays for the pill
☐ He reminds me to take the pill
☐ He helps me with the pill’s side effects
☐ He does not help me in any way
☐ Other: ____________________________
28. During this past menstrual cycle, how often did you use another form of birth control at the same time as taking birth control pills for extra protection against pregnancy (i.e., dual-method user)? (Please circle)

1 - Never
2 - A little of the time
3 - Some of the time
4 - Most of the time
5 - All of the time

29. During this past menstrual cycle, how often did you use another birth control method as a back-up method when you missed taking a pill? (Please circle)

☐ I did not miss any pills during this past cycle
1 - Never
2 - A little of the time
3 - Some of the time
4 - Most of the time
5 - All of the time

30. During this past menstrual cycle, what method(s) of birth control method have you used as a back-up method when you missed taking a pill? (Please circle)

☐ I did not miss any pills during this past cycle
☐ Male Condom
☐ Female Condom
☐ Morning after Pill (Emergency Contraceptive Medication)
☐ Extra oral contraceptive pills from my package
☐ Abstinence (no sexual intercourse)
☐ Other: ________________
☐ I missed at least one pill and we did not use any back-up birth control methods during this past cycle
Appendix K

Oral Contraceptive Medication List

Estrogen and Progestin Combination

1. Alesse® (containing Ethinyl Estradiol, Levonorgestrel)
2. Apri® (containing Desogestrel, Ethinyl Estradiol)
3. Aranelle® (containing Ethinyl Estradiol, Norethindrone)
4. Aviane® (containing Ethinyl Estradiol, Levonorgestrel)
5. Azurette® (containing Desogestrel, Ethinyl Estradiol)
6. Balziva® (containing Ethinyl Estradiol, Norethindrone)
7. Beyaz® (containing Drospirenone, Ethinyl Estradiol, Levomefolate)
8. Brevicon® (containing Ethinyl Estradiol, Norethindrone)
9. Cesia® (containing Desogestrel, Ethinyl Estradiol)
10. Crystals® (containing Ethinyl Estradiol, Norgestrel)
11. Cyclessa® (containing Desogestrel, Ethinyl Estradiol)
12. Demulen® (containing Ethynodiol, Ethinyl Estradiol)
13. Desogen® (containing Desogestrel, Ethinyl Estradiol)
14. Enpresse® (containing Ethinyl Estradiol, Levonorgestrel)
15. Estrostep® Fe (containing Ethinyl Estradiol, Norethindrone)
16. Femcon® Fe (containing Ethinyl Estradiol, Norethindrone)
17. Gianvi® (containing Drospirenone, Ethinyl Estradiol)
18. Jolessa® (containing Ethinyl Estradiol, Levonorgestrel)
19. Junel® (containing Ethinyl Estradiol, Norethindrone)
20. Kariva® (containing Desogestrel, Ethinyl Estradiol)
21. Kelnor® (containing Ethynodiol, Ethinyl Estradiol)
22. Leena® (containing Ethinyl Estradiol, Norethindrone)
23. Lessina® (containing Ethinyl Estradiol, Levonorgestrel)
24. Levlen® (containing Ethinyl Estradiol, Levonorgestrel)
25. Levlite® (containing Ethinyl Estradiol, Levonorgestrel)
26. Levora® (containing Ethinyl Estradiol, Levonorgestrel)
27. Lo/Ovral® (containing Ethinyl Estradiol, Norgestrel)
28. Loestrin® (containing Ethinyl Estradiol, Norethindrone)
29. Loestrin® Fe (containing Ethinyl Estradiol, Norethindrone)
30. LoSeasonique® (containing Ethinyl Estradiol, Levonorgestrel)
31. Low-Ogestrel® (containing Ethinyl Estradiol, Norgestrel)
32. Lutera® (containing Ethinyl Estradiol, Levonorgestrel)
33. Lybrel® (containing Ethinyl Estradiol, Levonorgestrel)
34. Microgestin® (containing Ethinyl Estradiol, Norethindrone)
35. Microgestin® Fe (containing Ethinyl Estradiol, Norethindrone)
36. Mircette® (containing Desogestrel, Ethinyl Estradiol)
37. Modicon® (containing Ethinyl Estradiol, Norethindrone)
38. MonoNessa® (containing Ethinyl Estradiol, Norgestimate)
39. Natazia® (containing estradiol valerate and dienogost)
40. Necon® 0.5/35 (containing Ethinyl Estradiol, Norethindrone)
41. Necon® 1/50 (containing Mestranol, Norethindrone)
42. Nordette® (containing Ethinyl Estradiol, Levonorgestrel)
43. Norinyl® 1+35 (containing Ethinyl Estradiol, Norethindrone)
44. Norinyl® 1+50 (containing Mestranol, Norethindrone)
45. Nortrel® (containing Ethinyl Estradiol, Norethindrone)
46. Ocella® (containing Drospirenone, Ethinyl Estradiol)
47. Ogestrel® (containing Ethinyl Estradiol, Norgestrel)
48. Ortho Tri-Cyclen® (containing Ethinyl Estradiol, Norgestimate)
49. Ortho Tri-Cyclen® Lo (containing Ethinyl Estradiol, Norgestimate)
50. Ortho-CEPT® (containing Desogestrel, Ethinyl Estradiol)
51. Ortho-Cyclen® (containing Ethinyl Estradiol, Norgestimate)
52. Ortho-Novum® 1/35 (containing Ethinyl Estradiol, Norethindrone)
53. Ortho-Novum® 1/50 [DSC] (containing Mestranol, Norethindrone)
54. Ovcon® (containing Ethinyl Estradiol, Norethindrone)
55. Portia® (containing Ethinyl Estradiol, Levonorgestrel)
56. Previsem® [DSC] (containing Ethinyl Estradiol, Norgestimate)
57. Quasense® (containing Ethinyl Estradiol, Levonorgestrel)
58. Reclipsen® (containing Desogestrel, Ethinyl Estradiol)
59. Safyral® (containing Drospirenone, Ethinyl Estradiol, Levomefolate)
60. Seasonale® (containing Ethinyl Estradiol, Levonorgestrel)
61. Seasonique® (containing Ethinyl Estradiol, Levonorgestrel)
62. Solia® (containing Desogestrel, Ethinyl Estradiol)
63. Sprintec® (containing Ethinyl Estradiol, Norgestimate)
64. Sronyx® (containing Ethinyl Estradiol, Levonorgestrel)
65. Tilia® Fe (containing Ethinyl Estradiol, Norethindrone)
66. Tri-Legest® Fe (containing Ethinyl Estradiol, Norethindrone)
67. TriNessa® (containing Ethinyl Estradiol, Norgestimate)
68. Tri-Norinyl® (containing Ethinyl Estradiol, Norethindrone)
69. Triphasil® (containing Ethinyl Estradiol, Levonorgestrel)
70. Tri-Previfem® [DSC] (containing Ethinyl Estradiol, Norgestimate)
71. Tri-Sprintec® (containing Ethinyl Estradiol, Norgestimate)
72. Trivora® (containing Ethinyl Estradiol, Levonorgestrel)
73. Velivet® (containing Desogestrel, Ethinyl Estradiol)
74. Yasmin® (containing Drospirenone, Ethinyl Estradiol)
75. Yaz® (containing Drospirenone, Ethinyl Estradiol)
76. Zenchent® (containing Ethinyl Estradiol, Norethindrone)
77. Zovia® (containing Ethynodiol, Ethinyl Estradiol)

Progestin-Only

78. Micronor®
79. Nor-Q.D.®
80. Ovrette®
Appendix L

Follow-Up Questionnaire

Today’s Date: _______________            Study ID #: □□□□□□□□□**

**Please enter the last four digits of your UH school ID number followed by the four digits of the month and day of your birth date (MM/DD). This will create a unique 8-digit personal identification number for the purposes of identifying your responses in this study. All of your data will be identified by this number to protect your identity.

Section A.

1. Are you still engaged in a heterosexual, monogamous, sexual relationship with the same partner as you were at the beginning of this study?
   - Yes
   - No

2. During this past month, how often did you engage in sexual intercourse with your partner?
   - None
   - Once a month or less
   - 2 or 3 times a month
   - Approximately once a week
   - 2 or 3 times a week
   - More than 3 times a week

3. During the past menstrual cycle, have you engaged in sexual intercourse with someone else who is not your partner?
   - Yes
   - No
   - Prefer not to answer

4. Are you currently pregnant?
   - Yes
   - No
   - I don’t know
5. First day of your most recent menstrual period (Last Menstrual Period)?
☐☐☐☐☐☐☐☐☐☐ MM/DD/YYYY

6. How would you describe the emotions that you would feel if you were to become pregnant right now? (Please circle)
1 - Very negative
2 - Somewhat negative
3 - Neither negative nor positive
4 - Somewhat positive
5 - Very positive

7. Considering only yourself, how important is it **not** to get pregnant right now? (Please circle)
1 - Not at all important
2 - A little important
3 - Somewhat important
4 - Very important
5 - Extremely important

8. During this current menstrual cycle, have you changed the brand of your oral contraceptive medication (the pill)?
☐ Yes ⇒ My new brand is __________________
☐ No

9. During this current menstrual cycle, did you take your inactive pills?
☐ Yes, How many? ______
☐ No

10. During this current menstrual cycle, did you start a new pill package before you are due for a new package for any reason?
☐ Yes
☐ No
11. During this current menstrual cycle, how many days did you miss taking your pill? (Please enter 0 if you did not miss any day)
______ days

⇒ If you did not take your pill for one or more days, what was the reason? (You may check multiple)
☐ I forgot to take the pill
☐ I had side effects
☐ I did not want to take the pill
☐ My partner did not want me to take the pill
☐ I could not find my pill package
☐ I don’t know
☐ Other: _____________

⇒ What did you do with the pill(s) that you did not take? Please explain.
_____________________________________________________________________
_____________________________________________________________________

12. During this current menstrual cycle, how frequently did you take your pill at the same time of the day?
☐ None of the time
☐ Little of the time
☐ Some of the time
☐ Most of the time
☐ All the time

13. During this past menstrual cycle, how often did you use another form birth control at the same time as taking birth control pills for extra protection against pregnancy (i.e., dual-method user)? (Please circle)
1 - Never
2 - A little of the time
3 - Some of the time
4 - Most of the time
5 - All of the time
14. During this past menstrual cycle, how often did you use another birth control method as a back-up method when you **missed taking a pill**? (Please circle)

☐ I did not miss any pills during this past cycle

1 - Never
2 - A little of the time
3 - Some of the time
4 - Most of the time
5 - All of the time

15. During this past menstrual cycle, what method(s) of birth control method have you used as a back-up method when you **missed taking a pill**?

☐ I did not miss any pills during this past cycle

☐ Male Condom
☐ Female Condom
☐ Morning after Pill (Emergency Contraceptive Medication)
☐ Extra oral contraceptive pills from my package
☐ Abstinence (no sexual intercourse)
☐ Other: __________________

☐ I missed at least one pill and we did not use any back-up birth control methods during this past cycle
References

*Nature Neuroscience, 15*(9), 1184-1191. doi: 10.1038/nn.3177


Early Discontinuation of the Pill in a Predominantly Hispanic Population.

*Perspectives on Sexual and Reproductive Health, 35,* 256-260.

doi: 10.1363/3525603


doi: 10.1016/j.whi.2010.03.008


doi: 10.1363/4311911


doi: 10.1363/4118109


doi: 10.1016/j.contraception.2009.02.009


doi: doi:10.1080/019261899262023


doi: 10.1177/1090198105277322