Womens' Perception of Quickening in Pregnancy

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DEDICATION

This paper is dedicated to my parents and grandmothers, who taught me about integrity and perseverance. And especially to my mother, who is a constant source of inspiration and support.

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ABSTRACT

This study was designed to determine the timing of quickening in pregnant women, and to discover if the quickening date was affected by parity or Body Mass Index (BMI). The subjects also described their babies' movements.

The 40 women who served as subjects were generally white, well-educated, and from the middle or upper class, with an average age of 30. Two private practice sites in the Portland area provided subjects over a seven-month period.

The women prospectively noted the date they first thought they felt their baby move, and the date when they were sure it was the baby. The range for the first date was 10 to 20 weeks, with a mean of 16.6 weeks. Certain quickening ranged from 14 to 22 weeks, with a mean of 18 weeks. These averages are consistent with published studies, which state quickening usually occurs at 17 to 19 weeks.

Parity was not significantly related to timing of quickening for either the early date or the sure date (17 primiparas and 23 multiparas). However, increased BMI was significantly related to later perception of the first "unsure" fetal movements. The 12 obese subjects reported their first quickening date an

ABSTRACT (continued)

average of 1.5 weeks later than those of relatively normal weight (r=.4148; p=.004). Body Mass Index was not related to timing of the second "sure" quickening date.

When entering the study, subjects were asked when they expected to feel quickening. The usual answer was 4-5 months. However, ten women expected quickening between 6 and 16 weeks and they experienced quickening significantly earlier than the other subjects.

The women's written descriptions of quickening fit into six categories: Bubble, Moving, Flutter, Spasm, Kick, and Other. Descriptions for the first quickening date varied depending on timing. Flutters were felt at 15 weeks while use of the word moving was related to quickening at 18 weeks. Descriptions for the second, "sure" quickening date usually used words such as moving or kick (or poke, tap, jolt, or bump).

The results of this study have several implications for practice and further research. For instance, parity was not significantly related to the timing of quickening for these subjects, although several other studies have found a significant relationship. This study discovered a possible relationship between BMI and timing of quickening. Further research is necessary to learn more about those variables which may influence quickening.

Health care providers should be aware that there seems to be a variable period during which quickening occurs and that individual characteristics of their

ABSTRACT (continued)

pregnant clients may influence the timing of quickening. Quickening should continue to be used as a secondary parameter for confirming the estimated date of delivery.

Knowledge of the words women frequently use to describe their babies' movements can help health care providers give anticipatory guidance to women who want to know what quickening will feel like. This initial study should be replicated by other qualitative research.

In addition, the possible relationship between timing and choice of words for description of quickening should be explored further, as this information could potentially be useful in confirming the gestational estimates of pregnancies.

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Chapter 1

For hundreds of years the word quickening has meant the first perception by a pregnant woman of her baby's movements in the womb. Quickening is regarded as a sign of life from the baby and is significant to the development of maternal-infant attachment (Heidrich & Cranley, 1989). However, womens' descriptions of quickening have not been systematically studied. Quickening is also used in confirming the estimated date of delivery (EDD), but its accuracy is difficult to achieve because the timing of quickening varies and may be influenced by factors such as parity.

Obstetrical textbooks state that quickening occurs around 18-20 weeks of pregnancy (Danforth, 1982; Gabbe, 1986). Previous studies have found quickening usually occurs between 17 and 19 weeks, and is usually influenced by parity (Kraus & Hendricks, 1964; Rawlings & Moore, 1970; Hertz et al., 1978; Anderson, Johnson, Barclay, & Flora, 1981; Jiminez, Tyson, & Reisch, 1983; Herbert, Bruninghaus, Barefoot, & Bright, 1987; Gillieson, Dunlap, Nair, & Pilon, 1984).

The quickening date is one of the factors used for confirming the gestational age of the fetus and the EDD. It is important for the health practitioner to estimate the EDD as accurately as possible, not only so the mother can plan for the birth, but so that appropriate health care can be provided for any complications. The treatment for many complications and the timing of some diagnostic tests depends on the gestational period of the pregnancy. Some of

the signs used to date a pregnancy include the last menstrual period (LMP), fetal heart tones (FHT) first auscultated with a fetoscope, and quickening. Gestational age during pregnancy may also be estimated by an early pelvic exam, fundal height, and the use of ultrasound. Until ultrasound was available to show early fetal movements, most health practitioners believed the fetus moved very little if at all during the first five months and quickening was thought to be caused by a dramatic increase in fetal activity (Kraus & Hendricks, 1964). Ultrasonography shows that fetuses at 7-8 weeks gestation make lateral head movements and the fetus gradually moves more until the mother is finally able to perceive it (Engstrom, 1985). Quickening is currently defined as the first time the mother is able to perceive fetal movements.

The study of quickening is significant to the nursing profession because nurses are important providers of prenatal care. Quickening is an important milestone in pregnancy and is usually documented in the chart. It is important for nurses and practitioners to be aware of factors which may influence the timing of quickening as ultrasound is not available to every woman and the EDD may need to be confirmed through the use of signs such as quickening.

Additionally, women often ask what quickening feels like and want to know how they will know it is happening. With a more accurate description of quickening, nurses will be better prepared to counsel women about its characteristics. Ultimately, this may provide more accurate reporting of quickening.

Review of Literature

The research reviewed in this paper focuses on determining the average gestational age when quickening occurs and identifies variables which may influence the timing of quickening. Both areas will be described.

Kraus and Hendricks (1964) were the first to study quickening. These authors noted that the prevailing belief was that quickening occurred between 16 and 20 weeks of pregnancy, and they studied 288 pregnancies to verify this. Their conceptual framework included the assumption that quickening is useful as a safe, easy method to help in dating a pregnancy but its accuracy is unknown. A sample of 217 white middle-class married women from one obstetrician's practice were studied. Because 60 women had additional pregnancies during the study period the researchers followed some women through several pregnancies. The women recorded the date of quickening during pregnancy, and the remaining data were collected after delivery. All subjects delivered a baby weighing 2500 grams or more and none were excluded from the study. The researchers analyzed data including LMP, parity, quickening, and sex of the infant. Parity was associated with a significant difference in timing of quickening. Primiparas experienced quickening at a mean of 19 weeks while multiparas typically noted quickening one week earlier (S.D. 2 weeks for each). The wide range of quickening times is significant. Primiparas noted quickening anywhere from 15 to 25 weeks and multiparas reported feeling it between 9 and 23 weeks. The sex of the infant made no

significant difference in the perception of fetal movements.

The prospective design for calculating the quickening date was a strength of this study. However, a major limitation was that no systematic method was available to estimate the gestational age of the newborns. By assuming that all newborns were delivered at term the researchers did not account for inaccurate LMP dates and EDDs, which could have affected the calculation of timing of quickening.

Rawlings and Moore (1970) conducted a similar study, attempting to show that quickening occurred at a predictable time during pregnancy and could be used to predict the EDD. No information is given about subject recruitment or the demographic characteristics of the population. The LMP was used to calculate the EDD for 441 pregnancies and the women were asked to record the quickening date prospectively.

The average quickening dates were compared for multiparas and primiparas and were significantly different. Primiparas noted quickening at a mean of 19.5 weeks while multiparas noted it at 18.5 weeks (S.D. 2 weeks for each group). The range of gestational age at quickening for the total sample was 13.5 weeks to 28.5 weeks.

No other variables were tested, and statistical tests were not described. It is difficult to assess the accuracy of the results in this study, because the authors found that the LMP dates were unreliable for many of the women. If the researchers did not have an accurate estimate of the gestational period at the

time quickening occurred, their calculation of time of quickening for some of their subjects would have been wrong. Another problem is the lack of information about the sample, which threatens external validity.

In 1978 Hertz et al. studied 690 consecutive pregnancies at an urban antenatal clinic. No information is reported about characteristics of the sample population. The authors intended to determine the average time of quickening and first auscultation of fetal heart tones (FHT) and compare their usefulness as estimators of EDD.

Dates of delivery, LMP, quickening, and FHT were compared for each subject. All infants were assessed in the nursery using the Dubowitz method (1970) to estimate the gestational age. The researchers counted back to the quickening date and based their calculation of the timing of quickening on the newborn gestational age estimate.

Both primiparas (283) and multiparas (407) had a mean quickening date of 18.5 weeks. No other variables that might have influenced quickening are reported. The authors concluded that a reliable LMP is the best predictor of EDD, followed by auscultated FHT and quickening. Based on their data, they concluded that a fetus had a 90% chance of being at least 38 weeks gestation if the pregnancy had continued for 42 weeks after the LMP and 25 weeks after quickening.

This study is limited by the poor control of data collection by the various chart recorders. Quickening and FHT dates were available for only half of the

subjects and LMP was recorded as reliable for only 18%. A more complete data set would improve the reliability of the results.

The use of the Dubowitz scoring system (Dubowitz & Dubowitz, 1970) to estimate the infant's gestational age may contribute to inaccurate results. The Dubowitz score has a standard deviation of 2.5 weeks, and was not a reliable method to use as the sole basis for calculating the gestational timing of quickening.

A chart review study published in 1981 compared the accuracy of various clinical indicators as predictors of EDD (Anderson, Johnson, Barclay, & Flora, 1981). Sequential charts were analyzed from two hospital antenatal clinics in the same city, from random periods over two years. The participants' characteristics were not described.

Women with complications such as preterm delivery were eliminated, leaving 418 women who delivered a baby weighing 3000 grams or more after spontaneous labor. Only half of these charts had a quickening date noted. The authors assumed that spontaneous labor indicated a term pregnancy (they did not define 'term'), therefore they did not evaluate the infant to estimate gestational age. By counting back from delivery date to the dates for quickening and LMP the authors determined that the 119 primiparas noted quickening at 19 weeks, and 85 multiparas experienced it at 17.5 weeks (S.D. 2.5 weeks for each group). The authors found that a reliable LMP was the most accurate predictor of EDD, while quickening, FHT, and fundal height

were less accurate. However, the use of these parameters significantly improved the accuracy of the EDD when used with an unreliable LMP.

This study used a retrospective design which did not allow for control of data collection, resulting in incomplete data. For instance, only half of the charts had a quickening date entered. The lack of documented reliability among those who collected data may have also resulted in less accurate dates, as the data collectors may have used different methods to determine quickening dates and LMP dates. The incomplete data base may have affected the validity of the study because of the many subjects who did not have a quickening date. That group of subjects may differ from the other women in some ways that could affect the timing of quickening, but it is impossible to assess this.

Jiminez, Tyson, and Reisch (1983) conducted a controlled study of 89 Mexican-American indigent women at a prenatal clinic. The women were seen weekly for evaluation of fundal height, FHT, and quickening. All subjects had regular menstrual cycle histories and were sure of their LMP, all had normal weight and an anteflexed uterus, and most were young primiparas. One practitioner saw all subjects and did not know the LMP or EDD dates. The authors vaguely suggest that the variables of maternal weight and uterine position were controlled to allow accurate assessment of fundal height and FHT. These variables could also potentially affect the timing of quickening.

Many women in this highly mobile sample dropped out of the study during

their pregnancies, reducing the sample size. Quickening was noted at a mean of 17 weeks (S.D. 2 weeks) by 30 primiparas and 21 multiparas. The authors verified gestational age at birth with Dubowitz exams for 20 of the infants and EDD from LMP was correct for all of them.

This was the first study to achieve some control over possible extraneous variables and to use a true prospective design. It is limited by the small sample. The lack of significant differences between primiparas and multiparas may have been due to the small sample size or to unknown variables.

Another controlled prospective study followed 77 women at an antenatal clinic (Herbert, Bruninghaus, Barefoot, & Bright, 1987). Women were seen weekly for auscultation of FHTs by obstetricians who were unaware of the LMP and EDD.

Quickening was noted by primiparas at a mean of 19 weeks and by multiparas at 17.5 weeks (no S.D. reported). The range was 15 to 22 weeks. The authors did not attempt to verify the accuracy of the EDD through Dubowitz scoring of the newborns, as they assumed that the certainty of the LMP dates provided enough reliability to produce accurate quickening dates.

This study would have benefitted from more data analysis. For instance, 8 subjects were obese (more than 120% of ideal weight for height) and their FHTs were heard one week later than average, but it is not stated whether quickening dates were different for this subset. Also, 31 women had ultrasound studies which noted the placement of their placentas. The 10 women with

anterior placentas had FHTs one week earlier than the 21 with posterior placentas. It would be interesting to know if placental location also affected the timing of quickening in these women.

Researchers in Canada studied the influence of both parity and placental location on the timing of quickening (Gillieson, Dunlap, Nair, & Pilon, 1984). All 112 women in the study had known LMPs and had ultrasound scans at 16-20 weeks which confirmed their original EDDs and showed placental sites on the anterior or posterior uterine walls. Some quickening dates were collected retrospectively at the time of the ultrasounds, but women who could not easily pinpoint the exact date were excluded from the study. Women who had not felt quickening yet were asked to report the date later. No other information about the participants' characteristics or the study site is reported.

Parity and placental location were independently significant. In the 57 women with anterior placental sites, quickening occurred at a mean of 19 weeks in primiparas and 17.5 weeks in multiparas (no S.D. reported). The 58 women with posterior placental sites felt quickening approximately one week earlier. Primiparas felt quickening at 18 weeks while multiparas felt it at 16 weeks.

The use of ultrasound correlated with an LMP in this study helped ensure accurate quickening times as the margin of error for ultrasounds before 20 weeks is small. A more complete report of the statistics, including the range of quickening and the standard deviation, would allow better comparison with the

other studies. The authors did report that both parity and placental location were significant ($p<.001$), which strongly supports their claim that both variables independently influence the timing of quickening.

Summary of Literature Review

The previous studies have generally found parity to be a significant variable in timing of quickening, with primiparas noting quickening at about 19 weeks gestation and multiparas noting it an average of 7-10 days earlier. Most studies had a standard deviation of 2 weeks with a range of quickening dates from 9 to 28 weeks, which is a significant variance when the goal is to determine the normal quickening date in a 40-week pregnancy. The current information about timing of quickening is not specific enough, and independent variables are just beginning to be identified.

Quickening has been studied with primarily quantitative methods, leaving a gap in the literature. There is no published research qualitatively describing the sensation of fetal movements in the mothers' own words.

Conceptual Framework

Quickening is used as a method of confirming the EDD during pregnancy and should be as accurate as possible so that appropriate maternity care can be given. The timing of quickening seems to be affected by the parity of subjects. Previous pregnancies may cause earlier quickening because of some physical cause. However, it is most likely that the experience of quickening increases a woman's awareness of how it feels and allows her to notice it

earlier in subsequent pregnancies.

Other factors may promote or inhibit perception of fetal movements. A possible inhibiting variable is increased body mass (weight). There are few sensory nerves in the uterus, and the gentle first fetal movements are probably felt against the abdominal wall. A thick adipose layer may prevent early detection of these movements.

Many women in early pregnancy ask what quickening usually feels like. Research has not yet explored this, and there may be some common ideas or concepts that women use to describe their babies' first movements. Also, it is possible that multiparas describe the movements differently than primiparas.

Chapter II

Methods

This chapter describes the methods used to answer the following research questions: 1) At what point in pregnancy do women usually perceive quickening? 2) Are the variables of parity and maternal weight related to the timing of quickening? 3) How do women describe the first perceived fetal movements? The study's design, variables, setting, sample, instruments, and procedures are described. The chapter concludes with a description of the statistical methods used to analyze the data.

Design

The study used a correlational, descriptive design at a factor-relating level. The major emphasis was on quantitative measures, with a qualitative-descriptive component. This design was intended to reveal any relationships between the timing of quickening and the variables of parity and body mass, as well as to describe characteristics of womens' perception of quickening.

A possible limitation of the correlational design is that all variables which influence quickening may not have been identified and tested. For instance, the study deliberately concentrated on physical factors and did not test for any possible psychosocial factors, so that relationships among physical factors were clearer. However, psychosocial factors such as whether the pregnancy was planned and wanted might influence the timing of quickening and threaten internal validity.

The study was prospective, involving pregnant women who had not yet experienced quickening with the index pregnancy. This design increased reliability by reducing participants' recall bias in LMP dates and quickening dates. The researcher was under time constraints and could not verify estimated date of delivery (EDD) dates after the women delivered their babies, which is a threat to internal validity. However, all charts were reviewed for ultrasound data to confirm estimates of gestational age and to contribute to the accuracy of quickening times.

Variables

The variables in this study were timing of quickening, parity, and body mass index. Quickening was defined as the first time the mother perceived the movements of her fetus. The design of the study also allowed for comparison of the first time the mother thought she felt quickening and the first time she was sure she felt it. This potential interval of time has not been previously reported in the literature.

In maternity practice, parity represents the number of pregnancies a woman has carried beyond the age of viability (28 weeks). In most previous studies the word parity was used to divide subjects into two groups: those who had been pregnant before and those who had not. However, the word gravidity fits this definition more accurately. For clarity throughout the remainder of this paper, the two terms will be used based on the following definitions. Gravidity refers to the number of times a woman has been pregnant, including the

present pregnancy. Women who were pregnant for the first time are referred to as primigravidas and those who had been pregnant before are multigravidas. For this study, parity was defined as the number of pregnancies each woman had carried long enough to feel quickening. A woman who had previously been pregnant but suffered a miscarriage and never felt quickening before the index pregnancy was defined as a *multi*gravida but a *primi*para. Parity was the variable analyzed in relation to the timing of quickening. The distinction between gravidity and parity is important because using the gravidity number by itself would have resulted in inaccurate results, as gravidity includes those pregnancies ending before the women have experienced quickening. On the data collection form for this study, women were asked with how many previous pregnancies they had experienced quickening. Their answers were entered in the data as parity.

Body mass index (BMI) was used in this study because it is a more accurate representation of body size than the use of weight alone (Institute of Medicine, 1990). The BMI is calculated using the following formula: weight in kg / height in cm^2. The number obtained from this computation is compared with a graph and is categorized as underweight, normal weight, overweight, or obese. Each study participant's BMI was calculated and operationally defined as being in one of the four categories according to the standards set by the Institute of Medicine. A BMI of less than 19.8 is considered underweight, 19.8 to 26.0 is normal weight, 26.0 to 29.0 is overweight, and a BMI over 29.0 is

obese.

Setting

The setting consisted of two private practices in the Portland, Oregon area that offer antenatal, intrapartum, postpartum, and gynecological care to women. The first site was a Clackamas County group practice made up of two nurse-midwives and three physicians. Most of the clients have private insurance and all deliver their babies in a local hospital. The second site was a free-standing birthing center run by three nurse-midwives. Most of the clients deliver at home or in the center, and many pay directly for their pregnancy care.

Sample

A convenience sample of approximately 170 women from the two sites were invited to participate in the study. Of these, 150 consented and provided initial data, including demographic information. Of these 150 women, 40 completed the study by providing exact quickening dates and descriptions of their experience of fetal movements over the seven-month data collection period. To encourage a heterogenous sample all women receiving early prenatal care at the two sites were invited to participate in the study, with the following exclusions: a) Women who had already felt quickening with the index pregnancy; b) Women not sure of their LMP, unless an early ultrasound was used to accurately estimate gestational age and EDD; c) Women carrying a multiple-gestation pregnancy, because of the possibility of early quickening; d) Women under the age of 18, because of potential problems getting informed

consent, and e) Women who could not read and write English.

Protection of Subjects

The research proposal and consent form for this study were approved by the Oregon Health Sciences University Committee on Human Research. The approved protocols guided the procedures for this study. All potential study participants were given the consent form to read and sign before they agreed to be in the study (Appendix A).

Instruments

Two data collection instruments were developed by the investigator for this study. Both instruments were pretested on seven pregnant women who completed the forms. Afterward they were interviewed by the investigator to assess clarity. No changes were made in the forms.

The first form (Appendix B) was a questionnaire designed to collect the majority of the data. It included demographic information and all variables except the quickening dates and description of fetal movements. This form was printed on green paper to help distinguish it from the other forms in the research packet and was titled Demographic Questionnaire.

To assess gravidity and parity status, the women were asked how many times they had been pregnant and how many previous pregnancies they had carried long enough to feel the baby move. The participants were also asked when they expected to feel quickening because it is possible that the expectation of early or late quickening may influence the timing of quickening in

some women. The remaining questions collected data regarding LMP and EDD dates, height and weight, and whether the client was seen by a CNM or an MD.

The second instrument (Appendix C), titled Fetal Movement Form, was filled out prospectively at home by the participant. The form asked her to write down the date she first thought she felt her baby move and to describe the movements in her own words. She was then instructed to write the date on which she was sure that what she felt were fetal movements and to describe them in her own words. When completed, the form was mailed to the researcher. The Fetal Movement Form was lavender and the women were instructed to keep it on the front of their refrigerator. The intent was to encourage women to notice the form often and remember to complete it when quickening occurred and mail it in. The form had 2 drawings on it to make it more interesting and to make the instructions clearer (see Appendix C). The first drawing was of a pregnant woman with a questioning look on her face and a baby who appeared to be wiggling. The second drawing, placed in the section asking for the date when the participant was sure she felt quickening, was almost identical except that the woman appeared excited and the fetus was definitely kicking. The use of these drawings was meant to add appeal to the form, but may be a threat to reliability because they may have somehow influenced the participants in their descriptions of their babies' movements.

Procedures

Research protocols were followed at the sites by the office nurses who

administered the instruments. Each potential participant was approached at the beginning of her first prenatal appointment by the office nurse who encouraged her to read the consent form and have any questions answered. Those who agreed to be in the study signed the consent form and were given a copy to keep. They filled out the Demographic Questionnaire and returned it to the nurse. She then gave them the Fetal Movement Form and a stamped, self-addressed envelope to take home. The two instruments were coded with a letter identifying the site and sequential numbers which made it possible for the researcher to match the forms after the women mailed in their fetal movement forms. The questionnaires were picked up periodically at the sites by the researcher who also retrieved each participant's chart and entered the remaining data on the questionnaire. These data, which included LMP, EDD, height and weight, was often not available to the office nurse who administered the questionnaire. Also, the EDD was occasionally changed by the nurse-midwife or doctor after an early ultrasound had been performed. Therefore, all charts were checked by the researcher several times during the pregnancy to ensure that accurate EDD and quickening dates were used in the data analysis.

Data Management and Analysis

Some of the data were adjusted by the researcher for consistency. Height was rounded off to the nearest inch, then converted to centimeters. Weight was rounded off and converted to kilograms for calculation of the BMI. The expected time of quickening was rounded to the nearest week.

When the Fetal Movement Form was received by the researcher the dates of quickening were calculated in days since the LMP, and then rounded off to the nearest week. The descriptions of fetal movements were entered word-for-word into a word processor and then coded for commonly used words and phrases.

The data were analyzed using the CRUNCH statistical package (version 4, Crunch Software Corporation, Oakland CA). Descriptive analysis of the demographic data included computation of means, SD, and frequency distributions. Correlations were analyzed using Pearson's r. Differences in means were analyzed using the student t test and ANOVA. The level of statistical significance was set at 0.05.

Chapter III

This section includes the results and discussion of the findings. The sample is described and research questions are answered. Additional findings are described, and the chapter concludes with recommendations for the use of this study and for further research.

Results

Sample

The sample consisted of 40 very homogeneous pregnant women. All but one was caucasian. All had completed high school, and 56% had at least some college education. The womens' ages ranged from 18 to 43 years with a mean age of 30 (S.D.= 5.9). The income level reported by the women averaged between $25,000-$29,000, however 50% had an income of $35,000 or more (there was no higher category on the instrument for them to mark). In summary, these participants were mainly white, well-educated adult women with generally middle-class or higher incomes.

Research Question One

The first research question asked at what point in pregnancy quickening occurs. The Fetal Movement Form that the women filled out prospectively at home asked them to write down two dates: the date each woman thought she first felt her baby move (labeled first quickening for this discussion) and the date she was sure of fetal movements (second quickening). The data analysis of these two variables is presented below.

The range of gestational age (Figure 1) for first quickening was 10 to 20 weeks, with a mean of 16.6 (S.D.=2.6). The median was 17 weeks and the mode was 18 weeks. The range of timing for second quickening was 14 to 22 weeks, with a mean of 18.2 (S.D.=2.1). The median was 18.5 and the mode was 20 weeks.

Research Question Two

The second research question had two parts. The first part asked if parity was related to timing of quickening, while the second part asked if BMI was related to timing of quickening.

Parity. Parity was measured by two questions on the Demographic Questionnaire. When asked if this was the first time they had ever been pregnant, 13 women said yes. This divided the group into 13 primigravidas and 27 multigravidas. However, when asked how many pregnancies they had carried long enough to feel quickening, 4 of the multigravidas said "none." These women probably had experienced an early pregnancy loss. Therefore, there were only 23 multigravidas who had previously experienced quickening, and this category was used as an independent variable in the data analysis. This distinction is important because the assumption made by researchers is that gravidity affects timing of quickening because of the experience of previous quickening. Not all multigravidas have had the opportunity to feel quickening with their previous pregnancies and it is necessary to consider this when collecting and analyzing data.

This variable of previous experience of quickening was labeled "parity" in the data analysis and the findings are illustrated in Figure 2. Of the 23 women who had carried previous pregnancies long enough to feel quickening, 11 had carried one, and 9 had carried two pregnancies.

Parity was not found to be statistically related to the timing of quickening. The T-test revealed no significant difference between the mean time of first quickening for primiparas (17.2 weeks) and multiparas (16.4 weeks) or between the mean time of second quickening for primiparas (18.9 weeks) and multiparas (17.9 weeks).

Body Mass Index. Of the 40 women, 24 had normal BMI values, one was underweight, and 3 were somewhat overweight. These subjects were grouped together for this study into a "normal" BMI category for analysis. There were 12 women with BMI values over 29, classifying them as obese. They were labeled "high BMI" for this study.

The BMI was significantly correlated with timing of quickening for the first quickening date reported by the women. The two-tailed Pearson's r coefficient was .4148; p=.008. Because it was anticipated that BMI might be correlated with timing of quickening, a one-tailed Pearson's r was also run which produced a value of r=.4148; p=.004. This value strongly suggests that increased BMI is related to a later first quickening date. When analyzed by ANOVA the women with high BMI values felt first quickening later (17.8 weeks) than women with normal BMI values (16.2 weeks). The two-tailed p value ($p<.08$) approached

significance. However, the BMI was not significantly related to the timing of the second quickening (time when the women were sure of baby's movements).

Research Question Three

The third research question asked how women describe fetal movements at the time of quickening. The women's descriptions of fetal movements were divided into six categories. The first one, "bubble", was used for phrases using the word bubble and describing the bubbles popping, rising and falling, or flowing in waves. The second category was "moving" and was used for responses using that specific word. "Flutter" was used for responses describing the feeling of fluttering or butterfly wings. A fourth category, "spasm", included responses such as spasm or twitch. The label "kick" was used for descriptions using the word kick, tap, jolt, bump, and poke. A sixth category, "other" contained varied responses such as "a ball rattling in a wire cage", "a change in pressure", "running your tongue inside your mouth", and "a hamster... under your sweater." These six categories were used for both the first and second descriptions of fetal movements.

All 40 women wrote descriptions for both the first and second quickening dates (Figure 3). The six categories were used with similar frequency for the first quickening date, with the exception of "spasm" which only applied to 10% of the women (Figure 3). The use of the other categories of description ranged from 25% to 33%. The difference in percentage of use of the descriptive categories for the second quickening date were more striking. "Spasm" was

only used 5% of the time, while 48% of the women used words falling under the heading "kick." "Moving" and "Other" were the other most frequently used categories for the second date.

Other Findings

There was no correlation between the variables of parity and BMI. Parity was also unrelated to the time women expected to feel quickening. Thirty-three (83%) of the women answered the question about when they expected to feel quickening. Many women answered in months, and these responses were averaged in terms of gestational weeks (4 months=16 weeks) for data analysis. The range of answers was 6 to 20 weeks, but 90% of women expected quickening between 16 and 20 weeks, which is consistent with the literature (Kraus & Hendricks, 1964; Rawlings & Moore, 1970). The mean answer was 17 weeks and the mode was 20. Ten women expected quickening between 6 and 16 weeks. Early expectation of quickening was significantly correlated to early perception of quickening, $r=.3748$; $p=.03$ for first quickening, and $r=.4702$; $p=.006$ for the second quickening date.

The difference between first and second quickening dates was calculated for each woman. The range was 0 to 8 weeks. The mean was 1.5 weeks (S.D. 1.6), the mode and median were both 1 week. The majority of women (63%) had less than 1 week between their first and second quickening dates. Early quickening (first date) was significantly related to a greater difference between first and second dates ($r=-.6080$; $p<.0000$). The parity of the women was not

correlated with the amount of difference in their two quickening dates. Parity also was unrelated to the types of descriptions women used to describe their babies' movements. However, the descriptions did vary depending on the timing of first quickening. The mean time for first quickening was 16.6 weeks. Women who described movements as "flutters" felt quickening at 15 weeks ($p=.02$), while those who described movements using the word "moving" felt first quickening at 18 weeks ($p=.06$). The second mean quickening time was not correlated with description of movements.

Discussion

This study differed from the others reviewed (Kraus & Hendricks, 1964; Rawlings & Moore, 1970; Hertz et al., 1978; Anderson, Johnson, Barclay, & Flora, 1981; Jiminez, Tyson, & Reisch, 1983; Herbert, Bruninghaus, Barefoot, & Bright, 1987; Gillieson, Dunlap, Nair, & Pilon, 1984;) in that it divided quickening into two separate dates: the time women thought they felt fetal movements, and the time they were sure of fetal movements. Generally, the timing of quickening in this study was similar to the findings of other studies that were reviewed. Average quickening for the other studies was 17 to 19 weeks. The mean quickening time in this study was 16.6 weeks for first quickening, and 18.2 weeks for second quickening. The reported quickening times in the earlier studies probably included both "unsure" dates when women thought what they were feeling might be the baby's movements, and "sure" dates when there was no question in the womens' minds that the sensations were truly fetal

movements.

This study also found that for women who felt possible fetal movements very early in the pregnancy, there was a significant period of time (several weeks to 2 months) before they felt certain of quickening. This group of women made up a significant portion of the total sample, as 33% of the total reported their first quickening date before 16 weeks of gestation.

This information is useful clinically. For instance, it is important to be careful when taking histories to ask pregnant women exactly when their last menstrual period was (for dating the pregnancy) and to make sure the data is as accurate as possible by asking for the last NORMAL period. The quickening date is also used to support gestational estimates and it might be helpful to devise a systematic method of asking women in the first trimester to write their quickening dates on their calendars prospectively to improve accuracy. Also, it may be important to specifically ask for the date when women are sure of fetal movements. It is possible that this second quickening date is less vulnerable to the influence of other variables and is the more accurate of the two for estimation of gestational age. Certainly the wide range of quickening dates found in this and previous studies indicates that quickening should continue to be used only as secondary data for calculation of the EDD.

This study found no significant correlation between parity and timing of quickening, which was unusual when compared with the review of literature. There are several possible explanations for this finding. First, the sample size

may be too small to adequately reveal a statistically significant difference, since the difference between primiparas and multiparas in this and the other studies seems to be only one week. Second, it is possible that parity truly does not have significant influence on the timing of quickening. Third, other confounding variables may interfere in a way that masks the influence of parity on timing.

The significant finding that BMI was correlated with timing of the first quickening date is interesting. This is a possible variable that has not been previously tested and may prove to be significant if tested in other studies. Clinically, knowledge of these variables could help in improving the usefulness of parameters such as quickening dates in accurately estimating the EDD. The fact that BMI did not appear to influence the second "sure" quickening date suggests that increased BMI makes the first, subtle fetal movements more difficult to feel but does not prevent the mother from perceiving the stronger kicks which come later.

The fact that BMI was not correlated with parity provides support for the independent nature of the possible influence (or lack of influence) of these two variables. It was expected that BMI would tend to increase along with increased parity among the subjects. Perhaps the sample size was too small to demonstrate this effect, or there may not be any relationship between the two.

Parity was not related to the time the women expected to feel quickening. One might expect that since multiparas had had previous experience with quickening, they would be more likely to state their expected date for

quickening within the average range. However, this was not demonstrated. Perhaps some women remember their quickening date from a previous pregnancy as the first (unsure) date. Or, perhaps if the instrument used in this study had asked the women to give their expected quickening time in weeks, rather than just asking them "when do you think you will feel your baby move?", the responses might have been more accurate and significant.

The fact that early expectation of quickening was significantly related to actual early quickening dates is a new finding. There are two possible explanations for this correlation. Previous experience may have led some women to expect early quickening because they had had early quickening with their last pregnancy. A more likely explanation is that quickening, especially the perception of the very first gentle, early fetal movements is very subjective and may be influenced by what the women think is going to happen. Also, women who expect early quickening may be psychologically more attached to their fetuses at an earlier age and may be more tuned in to all aspects of their pregnancy, including fetal movements.

Parity was not correlated with the amount of difference between first and second quickening dates. This finding, coupled with the earlier one that the difference is significantly related to the timing of first quickening, suggests that it is not the amount of experience a woman has with quickening that determines her ability to be certain of it, but that it is the *timing* of the first perception of movements that affects her ability to be certain that what she feels is really fetal

movements.

The descriptions of fetal movements on the Fetal Movement Forms were often very detailed. Many women seemed to go to great lengths to communicate as clearly as possible exactly what quickening felt like to them. The responses often contained comments about how the women felt emotionally when they felt the first fetal movements. Quickening seemed to be a very positive, affirming experience for many of the respondents. Some of the women also wrote comments describing things they had not expected, such as "it didn't feel like gas bubbles the way everyone always tells you" or "this baby's movements feel very different from my last one's."

The responses were varied but generally fit the six categories described earlier. Some women used descriptions that crossed into several categories, although women who used the word "bubble" rarely also described "flutters", and vice versa. The significant relationship between timing of first quickening and the choice of certain words to describe the movements ("flutter" with early quickening and "moving" at a later date) to describe the movements may be useful clinically. Health care providers who know what words women often use to describe early and later fetal movements may be able to provide more accurate anticipatory guidance to women who want to know what quickening will feel like. This finding may also be useful to evaluate dating. A woman who describes her baby's first movements as "poking and kicking" is more likely to be 18 weeks pregnant than 15 weeks, for instance.

Limitations

This study is limited by the small sample size, especially because several variables were being studied. A larger sample would strengthen reliability and perhaps produce more statistically significant results. The sample size did seem to be adequate for the collection of data concerning women's descriptions of quickening. However, a larger sample might allow for more precise categorizing of the responses and an even richer collection of qualitative data.

The demographic information would be more complete with the addition of a question about marital status or social support, and a question about whether the baby is wanted or unwanted. Also, the income data needed more categories on the upper-income level.

The pictures on the Fetal Movement Forms may have influenced the descriptive responses of some women. Also, although the providers at both research sites were instructed not to offer suggestions to the participants about how quickening might feel, it is possible that some of the women over the seven month data-collection period described quickening using phrases they had heard used during their early prenatal care.

At the time this study was completed, some of the women who had filled out Demographic Questionnaires had not yet felt quickening and were not included in the data analysis. A total of 39% of those who had filled out the initial questionnaires made up the sample of 40 women. It is possible that there are differences in the remaining population of women who did not send in their

Fetal Movement Forms compared with the study sample. These differences could have potentially altered the results of the study, creating a threat to reliability. Additionally, the use of only two sites for data collection and the homogenous nature of the study sample limits the generalizability of the study results.

Recommendations for Further Research

Replication of this study with a larger, more heterogenous sample would help to verify the influence of selected variables on the timing of quickening. Also, a more accurate way of defining quickening, or the continued use of this study's two quickening dates might improve knowledge about the normal gestational age for quickening. The addition of ultrasound for dating as a consistent variable in quickening studies will help improve accuracy in determining exact times for quickening.

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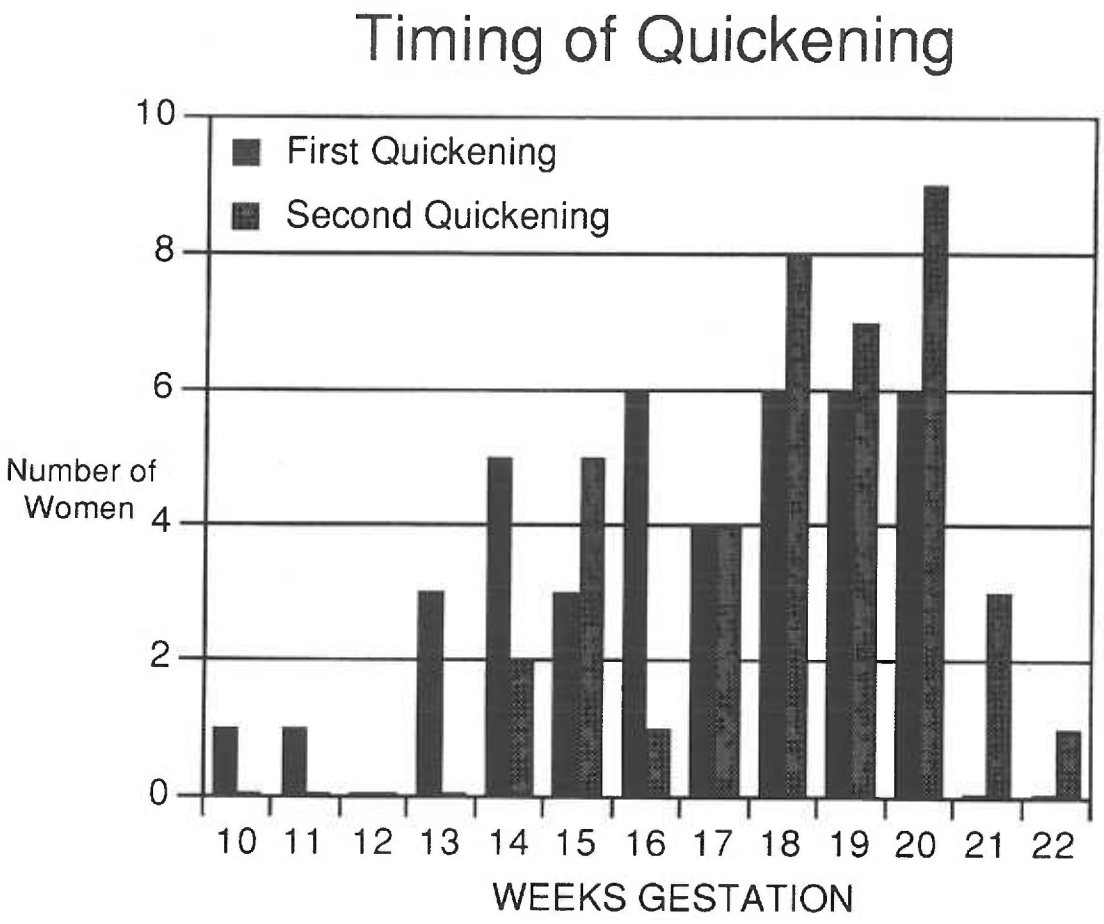
Timing of Quickening
First Quickening
Second Quickening
Number of Women
0
2
4
6
8
10
10 11 12 13 14 15 16 17 18 19 20 21 22
WEEKS GESTATION

Figure One

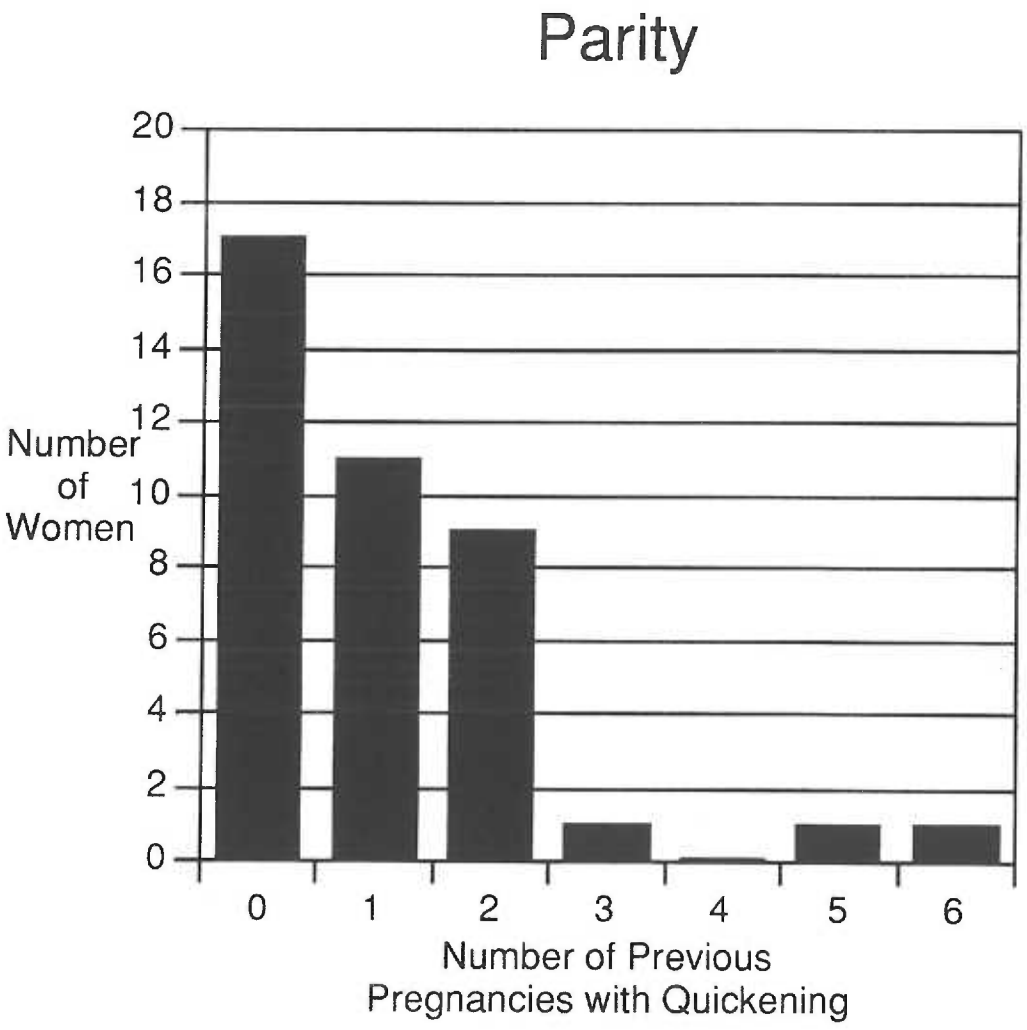
Parity
20
18
16
14
12
10
8
6
4
2
0
Number of Women
0
1
2
3
4
5
6
Number of Previous Pregnancies with Quickening

Figure Two

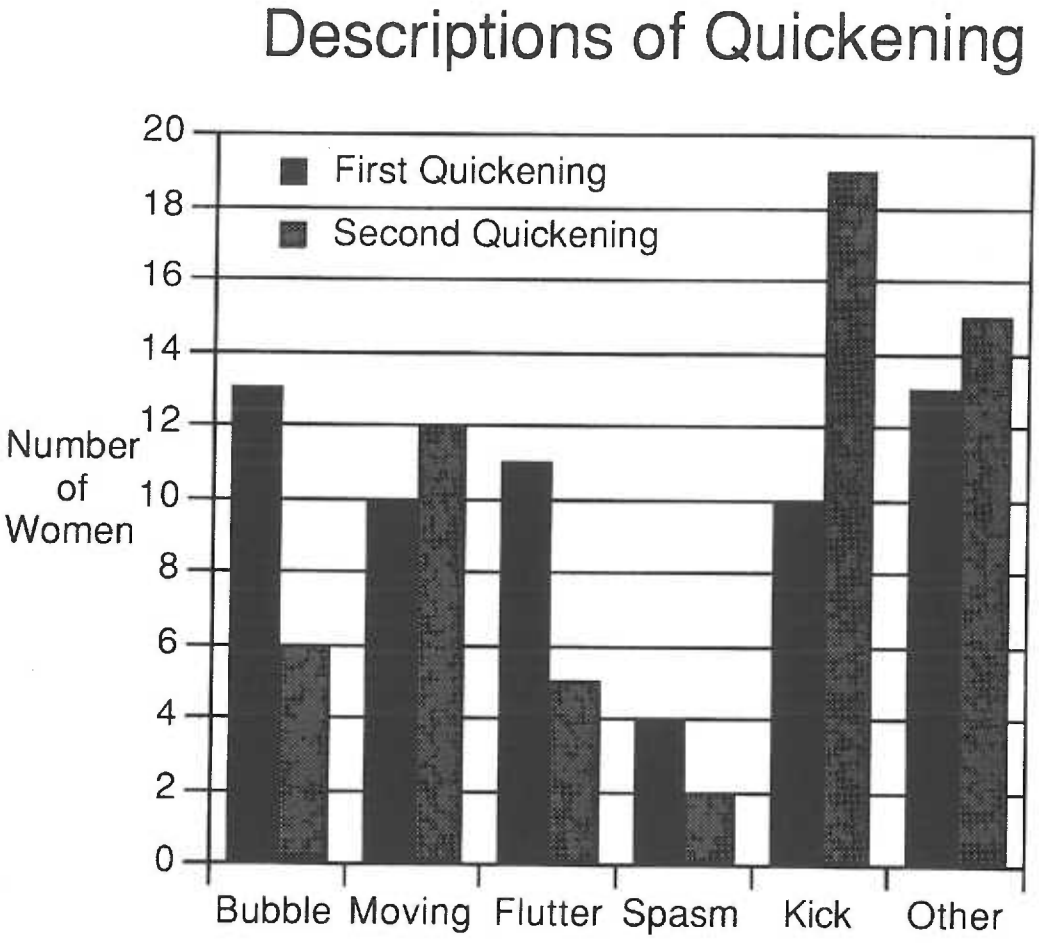

Figure Three

APPENDIX A

Consent Form

Oregon Health Sciences University

Consent Form

TITLE: Women's perception of quickening in pregnancy

INVESTIGATOR: Kathleen Murray, RN Phone Message: 494-8383

PURPOSE: I am researching when women usually feel their babies move for the first time during pregnancy, and what that movement feels like. I believe that this experience is different for individual women, and your participation in this study would help me to find out if that is true.

There is no cost to you for being in this study, and no known risks, other than the inconvenience of filling out two forms. While you may not personally benefit from the study, by serving as a subject you may contribute information which could benefit pregnant women in the future.

If you participate in this study, you will fill out one questionnaire (9 questions) today and another short one when you feel your baby move for the first time.

Your name will not appear on the forms. I have asked for your phone number so that I can follow-up if a form is lost or delayed. When you send in your form or after I call you, your consent form will be removed from your questionnaire and your name will not be associated with what you write on the forms. The results of the study will be reported as a group and your individual responses will not be identified. When the answers have been grouped together and analyzed, all forms will be destroyed. Neither your name nor your identity will be used for publication or publicity purposes.

You may refuse to participate, or you may withdraw from this study at any time without affecting your relationship with or treatment by your health care provider.

You will be given a copy of this consent form after signing it. I would be happy to answer any questions you may have, and can be reached at the phone number listed above.

Your signature below indicates that you have read the foregoing and agree to participate in this study.

Signature _____ Date _____

Witness _____

APPENDIX B

Demographic Questionnaire

If you have decided to be part of this study, have you signed the consent form? Please answer questions 1 through 9 and give this to the nurse who calls you from the waiting room. She will take the green forms and give you the purple and white ones to take home.

Questionnaire

1. What is today's date? _____

2. What is your age? _____

3. What is your home phone number? _____

4. What is your ethnic origin? (circle one)
   Latin-American White African-American
   Native American Asian-American Other

5. What is the highest grade you have completed in school? (circle one)
   High school: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
   College: 1, 2, 3, 4, 5 or more

6. What was your family's income last year? (circle one)
   $0-$4,999 $20,000-$24,999
   $5,000-$9,999 $25,000-$29,999
   $10,000-$14,999 $30,000-$34,999
   $15,000-$19,999 $35,000 or more

7. Is this the first time you have ever been pregnant? (circle one)
   yes no

8. If no: how many pregnancies have you carried long enough to feel the baby move? _____

9. When do you expect to feel your baby move in this pregnancy? _____

STOP HERE PLEASE

To be filled in by health care provider.

10. Date of LNMP _____

11. Date of best estimate EDD _____

12. How firm (accurate) is this EDD? (circle one)
    Very Moderate (±2 weeks) Not firm (±4 weeks)

13. Height in stocking feet, measured today _____

14. Today's weight _____

15. Seen by (circle one) CNM MD

APPENDIX C

Fetal Movement Form

Baby's Movement Record

Please keep this form on the front of your refrigerator or someplace where you won't forget about it. Fill in the dates below when you first feel your baby move.

Please write the date in the space below when you first THINK you feel your baby move.

_____

Please describe in your own words what it feels like when the baby moves.

_____

_____

_____

_____

_____

Please write the date in the space below when you are SURE you feel your baby move.

_____

Please describe in your own words what it feels like when the baby moves.

_____

_____

_____

_____

_____

When you have completed this form, mail it in the enclosed self-addressed envelope to:

Kathleen Murray
821 S.E. 41st #81
Portland, OR 97214-4455

THANK YOU FOR PARTICIPATING IN THIS STUDY!!!!!