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PHYSICAL ACTIVITY DURING PREGNANCY AND BIRTH WEIGHT

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16. Abstract (Limit: 200 words) A prospective study was undertaken of 189 indigent black and white women receiving prenatal care at a clinic. The various activities in which these women were involved were carefully measured including occupational, recreational and household activities. About 40% of the women had worked outside the home during pregnancy. Average weekly kilocalorie expenditure levels for each of the three types of activity were calculated each trimester. Increased total weekly physical activity levels were associated with decreased birth weight among black women, but not among white women. A difference in activity patterns of housekeeping existed between blacks and whites and it was this activity which was related to decreased birth weight among the blacks. This effect persisted after controlling for maternal height, smoking habits, prepregnant weight, and gestational weight gain. Predictors of decreased birth weight among whites included smoking, prepregnant weight and gestational weight gain.				
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Table of Contents

Heading	Page Number
Abstract.....	i
List of Abbreviations.....	ii
List of Figures.....	iii
List of Tables.....	iv
Introduction.....	1
Methodology.....	1
Results.....	2
Conclusions.....	13
Significant Findings.....	14
References.....	15
Appendices.....	17

Abstract

The effect of maternal physical activity during pregnancy on infant birth weight is an area of research which has generated many recent studies with conflicting results. The current project was a prospective study of 189 indigent black and white women receiving prenatal care at Magee clinic. Data on all facets of a woman's activity, consisting of occupational, recreational, and house hold activities were collected over the course of pregnancy. Demographic characteristics, lifestyle behaviors, and medical/reproductive histories were also obtained. Average weekly kilocalorie expenditure levels for each of the three types of activity were calculated per trimester, as well as a sum of these three components to represent an average weekly total kilocalorie expenditure level.

The results indicated that increased total weekly physical activity levels were associated with decreased birth weight among black women, but not in whites. In addition, it appeared that a difference in activity patterns of housekeeping existed between blacks and whites, and that it was this activity which was related to decreased birth weight among blacks. This effect persisted after controlling for maternal height, smoking, pre-pregnant weight, and gestational weight gain. Among whites, smoking, pre-pregnant weight and gestational weight gain were predictors of decreased birth weight.

List of Abbreviations

LBW: Low birth weight
GA: Gestational age
PA: Physical activity
BW: Birth weight
g: grams
kcal: kilocalorie
SD: Standard deviation

List of Figures

Figure	Page number
Figure 1. Number of infants per birth weight category, by race, in the physical activity and birth weight study.....	7
Figure 2. Trend in mean birth weight by race and activity quintile in the third trimester.....	8

Table Number

Page

Table 1.	Demographic characteristics of women, by race, in the physical activity and birth weight study.....	3
Table 2.	Reproductive histories and behavioral characteristics, by race, in the physical activity/birth weight study.....	4
Table 3.	Race-specific means of kilocalorie expenditure, by type of activity and trimester.....	5
Table 4.	Maternal weight parameters (in pounds) by race.....	6
Table 5.	Relation between types of activity and birth weight, by race and trimester.....	8
Table 6.	Trend in mean birth weight among white women by quintile of physical activity in the second and third trimester....	9
Table 7.	Trend in mean birth weight among black women by quintile of physical activity in the second and third trimester....	10
Table 8.	Characteristics significantly related to birth weight in the univariate analysis, by race.....	11

INTRODUCTION

In 1979, the Public Health Service described physical fitness and exercise as one of fifteen areas of greatest importance for improving the health of the public (1). Included in the 1990 health objectives for the nation was the attainment of physical fitness, defined as exercising at 70% maximum heart rate three times per week, by 90% of youths and 60% of the adult United States population (2).

For several years, there existed the virtually uncontested belief that exercise resulted in physical fitness which in turn resulted in decreased risk of several adverse health outcomes, most notably, cardiovascular disease. Most of the literature has focussed on the relationship between exercise and coronary heart disease. Little is known concerning the effects of physical activity during pregnancy, despite the fact that in 1978, a review of the prematurity literature recommended the assessment of physical activity before and during pregnancy as an important area for future research (3).

Recent years have witnessed a dramatic increase in the number of women engaging in physical activities. This includes both leisure time sports and activities associated with employment. Bureau of Labor statistics from 1984 indicate that one-third (31.6%) of the work force was comprised of women of childbearing age. Not only are there more women working, but increasing numbers are continuing in their employment up until the time of delivery. Very little is known about the risks and benefits of work and leisure time activities during pregnancy on pregnancy outcomes.

As early as the 1890's, studies suggesting an association between maternal employment during pregnancy and decreased birth weight appeared in the literature (4). There have been numerous studies published recently with conflicting results on the association between physical activity during pregnancy and birth weight and/or gestational age. Most of these studies focussed on one aspects of a woman's activity, i.e., occupational or recreational activities (5-29). Measurement of activity varied widely across the studies, from job classification schemes to surveys of different types to activity monitors and treadmill tests. Small sample size and unrepresentative samples, inadequate control for confounders, biases introduced by retrospective design, and limited measures of physical activity level have plagued the generalizability of many of these studies' findings.

The aim of this research was to examine the relationship of occupational, leisure time, and household activity during pregnancy and birth weight. The study evaluated the risks and benefits of physical activity in pregnant women through the prospective examination of types and patterns of activity during each trimester and relationships to infant birth weight.

METHODOLOGY

The study population consisted of 250 pregnant women from a large womens' hospital in Allegheny County, Pennsylvania. Subjects were identified in a consecutive manner as they

reported for prenatal care. Eligibility criteria were age between 18-30 years and gestational length ≤ 7 months at time of enrollment. Exclusion criteria were any medical condition known to place the woman in a high risk pregnancy category, and multiple gestations. Data collected included demographic characteristics, medical/reproductive history, occupational and environmental exposures, behavioral factors (smoking, alcohol, and drug use), and any illnesses which occurred during the pregnancy. Data were collected by phone or during a prenatal visit to the clinic, per subject preference. An assessment was made of each woman's total daily physical activities by determining the three major components of activity: occupational, leisure time, and household.

Occupational activity was assessed by the CDC-Behavioral Risk Factor Surveillance Form (Appendix A), which was adapted to address the key issues of physically demanding tasks as well as the amount of time spent sitting and standing still at work. The Paffenbarger Survey (Appendix B) was utilized to assess the subjects' leisure time activity, and also was adapted to evaluate activities related to house work. This survey was tested for reliability in a subsample of the population, with test-retest correlations of .80. Average weekly kilocalorie expenditures for each of these three types of activity were calculated per subject per trimester, as well as the sum of these three components to represent an average total weekly kilocalorie expenditure level per trimester.

Data abstraction from the medical records included ultrasound examination for the calculation of gestational age (which is done routinely for clinic patients at approximately week 16 or at the first prenatal visit if it occurs after that point in gestation); birth weight; maternal weight at the end of each trimester (or at delivery); number of prenatal visits; and labor and delivery complications.

Univariate analysis were run on both the total sample and by race to determine the relationships between birth weight and the demographic, behavioral, and reproductive history variables, and between birth weight and each of the physical activity characteristics. Race-specific tests of trend for mean birth weight across quintiles of activity were conducted. Finally, race-specific multiple linear regression analyses were done to determine the independent effect of physical activity on birth weight while controlling for confounders.

RESULTS

A total of 221 women (84.4%) had delivered at the time of this writing. Thirty of these women were recruited from private obstetricians' offices. The present analysis is limited to the clinic population of 189 women.

The participation rate from this clinic population was 95.1%. Twenty-three women (9.2%) who enrolled did not complete the study, and they were replaced as they withdrew. Of these 8 (34.8%) withdrew, generally because of "disinterest" in the study. The other fifteen women (64.5%) were unable to be contacted after enrollment either because 1) their telephones were disconnected and the subjects failed to report to the clinic for their scheduled prenatal visits ($n=7$); 2) the women moved out of the study area ($n=5$); 3) two women married and changed their last names before a medical record number was obtained for them; and 4)

TABLE 1

Demographic characteristics of women in the physical activity and birth weight study, by race

	Blacks	Whites	p-value
Age	23 (± 3)	23 (± 3)	
Income	n (%)	n (%)	.09
< \$10,000	55 (60.4)	56 (57.2)	
\$10-19,999	20 (20.2)	30 (30.6)	
\$20-34,999	3 (3.3)	7 (7.1)	
DPA	13 (14.3)	5 (5.1)	
Marital status			
Never married	73 (80.2)	50 (51.0)	<.001
Married	13 (14.3)	38 (38.8)	
Divorced	1 (1.1)	7 (7.1)	
Separated	4 (4.4)	3 (3.1)	
Education			
< High School	16 (17.6)	14 (14.3)	.67
High School	48 (52.7)	53 (54.1)	
Some college	24 (26.4)	27 (27.6)	
College	3 (3.3)	4 (4.1)	
Live with partner			
Yes	33 (36.3)	56 (57.1)	.007
No	49 (53.8)	39 (39.8)	
Missing	9 (9.9)	3 (3.1)	
Work outside the home			
Yes	31 (34.1)	45 (45.9)	.130
No	60 (65.9)	53 (54.1)	

one woman was being sheltered at a home for battered women.

The demographic characteristics of the population by race are presented in Table 1. Fifty-two percent were white; 48% were black. Forty percent of the total population worked outside of the home at some point during pregnancy; employment status did not differ significantly by race. Income was not significantly different in this sample by race, although there were more blacks than whites in the lower income categories. In addition, highest level of educational achievement did not differ by race, with 70% of blacks and 68% of whites having a high school education or less. However, two related variables, marital status and living with spouse/partner were different by race. Thirty-nine percent of the white women were married compared to 14% of the blacks ($p < .001$), and 57% of the whites were living with their spouse/partner compared to 36% of the blacks ($p = .007$).

Table 2 illustrates the reproductive histories and behavioral characteristics by race. There were more nulliparous white women than black (48% vs 30.8%, $p = .02$), and the range of previous live births was 1-10 in the blacks and 1-4 in whites. The mean number of children was significantly higher in blacks (1.38 compared to .796 in whites, $p < .001$). History of at least one previous live birth weighing less than five pounds was similar in both races. A greater proportion of blacks had a history of live births weighing more than five pounds, but all of these figures are influenced by the higher parity in the black women. In addition, miscarriage and induced abortion were also more common among the black population. Concerning behavioral factors, the proportion of smokers was significantly higher among the whites, although the proportion of heavy smokers (> 10 cigarettes daily) did not differ by race. The proportion who reported alcohol use at baseline was not different in the two groups.

TABLE 2

Reproductive histories and behavioral characteristics, by race, of the women in the physical activity and birth weight study, University of Pittsburgh, 1988-1990.

	Blacks (n=91)	Whites (n=98)	p-value
Characteristic	n (%)	n (%)	
Nulliparity	28 (30.8)	47 (48.0)	.02*
Parity (x)	1.38	.798	<.001*
Live births	9 (9.9)	8 (8.2)	.87
<5 lbs.			
Live births	61 (67.0)	46 (46.9)	.008*
>5 lbs.			
Miscarriage	18 (19.8)	12 (12.2)	.22
Stillbirth	0	1 (1.0)	
Abortion	36 (39.6)	25 (25.5)	.05*
Smoking	35 (38.0)	53 (54.0)	.04*
Alcohol	38 (41.7)	38 (38.8)	.65

The race-specific means of kilocalorie expenditure, by type of activity and by trimester, are shown in Table 3. Looking first at the house work component, the mean kilocalories expended in household chores declined as pregnancy progressed in both races. There was a significant difference in household energy expenditure between blacks and whites in the first two trimesters of pregnancy, but not in the third trimester. However, there was not a consistent pattern to these differences, with black women having higher mean kilocalorie expenditures in the first trimester, but lower in the second and third trimesters. Regarding occupational activity, both races again exhibited a decrease in occupational kilocalorie expenditure as pregnancy progressed. The racial difference in mean occupational kilocalorie expenditure was marginally significant in the first trimester, significant in the second, and again there was no difference in the third trimester. Whites showed higher occupational kilocalorie expenditure in all three of the trimesters compared to blacks.

TABLE 3

Race-specific means of kilocalorie expenditure, by type of activity and by trimester, for women in the physical activity and birth weight study

<u>Trimester 1</u>	<u>Blacks</u> n=83	<u>Whites</u> n=95	p-value
Activity			
House chores	3344	3100	.001*
Occupation	2935	4020	.068
Leisure time	3169	3075	.194
Overall	9593	10315	.325
<u>Trimester 2</u>	<u>Blacks</u>	<u>Whites</u>	
House chores	2882	3073	.007*
Occupation	2587	3585	.019*
Leisure time	3044	2845	.107
Overall	8522	9546	.761
<u>Trimester 3</u>	<u>Blacks</u>	<u>Whites</u>	
House Chores	2603	2677	.520
Occupation	2490	3161	.385
Leisure	2450	1579	<.001*
Overall	7617	7417	.408

With the leisure time component, a similar pattern of decreasing kilocalorie expenditure was seen in both races. However, the pattern was different here in that only the third trimester revealed a significant racial difference, with the blacks having a higher mean leisure time caloric expenditure in all three trimesters compared to whites.

The sum of these three individual activity components represented the average kilocalorie expenditure per week in each of the three trimesters. Overall, the women tended to decrease their physical activity as pregnancy progressed. There were no significant differences in total kilocalorie expenditure by trimester, with the whites having higher mean values until the third trimester.

Maternal weight parameters, which have been consistently linked with infant birth weight in many studies, are described in Table 4. As it is weight gain throughout pregnancy that is considered to be the most important factor rather than total weight gain itself, mean third trimester weight gain is presented here, as well as mean overall weight gain. Because 28% of the clinic population did not report for their first prenatal visit until approximately week 16 of gestation, it was not possible to calculate weight gain for the first two trimesters. Pre-pregnant weight, mean third trimester weight gain and mean overall weight gain did not differ by race.

TABLE 4

Maternal weight parameters (in pounds) by race, for women in the physical activity and birth weight study, University of Pittsburgh, 1988-1990

	Pre-pregnant (mean)	Trimester 3 (mean weight gain)	Total (mean weight gain)
<u>Blacks</u>			
Mean	139	9.3	30.6
Range	82-235	-29, 27	-14, 98
SD	29.9	8.2	16.3
<u>Whites</u>			
Mean	137	12.4	33.3
Range	90-259	-9,42	-20,83
SD	31.5	7.5	16.9

Figure 1 presents the number of infants per birth weight category by race. The mean birth weight for the total sample was 3253 g; for whites 3344 g, and for blacks 3153 g, a difference of 191 g ($p=.004$). Examining term infants only, the mean birth weight for whites was 3384 g and for blacks 3323 g, a difference of 61 g ($p=.768$). Therefore, a total of 130 g can be accounted for by gestational age, leaving 61 g to be explained by other risk factors. The rate of prematurity in the total sample was 8.5% ($n=16$). By race, 11% of black infants were born prematurely compared to 6% of whites. The mean gestational length in blacks was significantly shorter compared to whites (38.4 vs 39.5 weeks, $p<.001$).

Figure 1



Number of infants per birth weight category, by race, in the physical activity and birth weight study

The relation between types of activity and birth weight, by race and by trimester, are presented in Table 5. The correlations began to increase in magnitude in blacks in the second trimester, with higher levels of occupational and leisure time activity being related to decreased birth weight. An inverse occupational activity-birth weight relationship approached significance ($r = -.15$, $p = .097$). There were no relationships between birth weight and physical activity parameters in the second trimester for whites.

In the third trimester, there were significant inverse correlations between occupational and household kilocalorie expenditures and birth weight in blacks, which again were not seen in whites. Leisure time activities were not related. The different relationships observed for household activity between the races is particularly interesting, as these two groups were so similar in mean household caloric expenditure levels in the third trimester (Table 3).

Race-specific tests of trend continued to support the relationship between increased physical activity and decreased birth weight in blacks but not in white women. Table 6 illustrates the mean birth weight among blacks from lowest to highest quintile of kilocalorie expenditure levels in the second and third trimesters. In the second trimester, it appeared that moderate physical activity had a beneficial effect, but at the extreme levels of activity, birth weight fell to the lowest point. In the third trimester, the general trend was a decrease in birth weight

TABLE 5

Relation between types of physical activity and birth weight, by race and by trimester, in the physical activity and birth weight study

Activity	<u>Trimester 1</u>			
	Blacks n=86		Whites n=95	
	Correlation (p-value)		Correlation (p-value)	
House work	-.03	.403	.00	.496
Occupation	-.08	.238	.06	.263
Leisure	-.08	.218	.05	.313
<u>Trimester 2</u>				
House work	.01	.473	.09	.181
Occupation	-.15	.097	.05	.300
Leisure	-.13	.107	.00	.479
<u>Trimester 3</u>				
House work	-.19	.047*	-.05	.315
Occupation	-.19	.046*	.15	.072
Leisure	.03	.382	-.13	.103

as physical activity increased. Although not statistically significant, there was a 114 g decrease in mean birth weight in the second trimester, and a 126 g decrease in the third trimester, in infants born to the most physically active women compared to those in the least active group.

Among whites (Table 7), there again was no relationship between increasing physical activity and decreasing birth weight in either trimester. In fact, the mean birth weight of infants in the highest physical activity quintile was 88 g higher than that of infants in the lowest quintile in the third trimester. In both trimesters in whites, birth weight fell to the lowest level in the moderate activity group. This trend in birth weight across quintile of activity in the third trimester is presented in Figure 2.

Figure 2

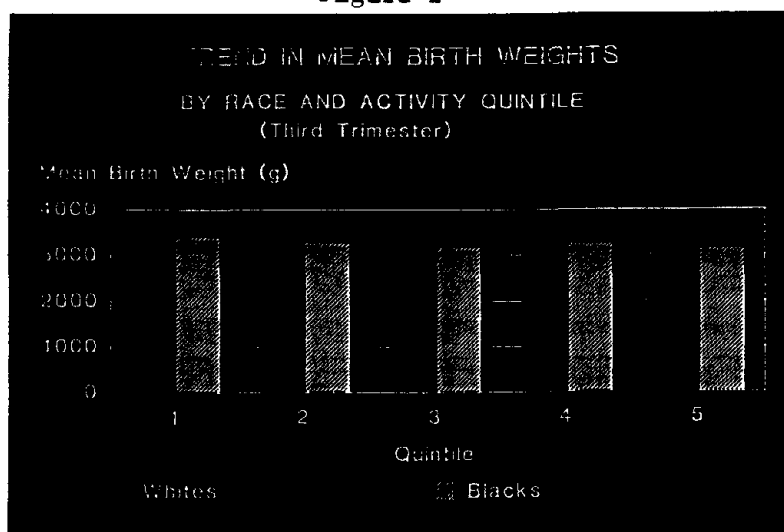


TABLE 6

Trend in mean birth weight among white women from lowest to highest quintile of kilocalorie expenditure levels

Trimester 2		
	Birth weight (x)	SD
Quintile 1	3310 g	412.29 g
Quintile 2	3339 g	625.97 g
Quintile 3	3219 g	524.83 g
Quintile 4	3486 g	479.14 g
Quintile 5	3380 g	590.56 g
Trimester 3		
Quintile 1	3389 g	533.08 g
Quintile 2	3386 g	572.06 g
Quintile 3	3151 g	451.53 g
Quintile 4	3561 g	476.61 g
Quintile 5	3474 g	607.22 g

TABLE 7

Trend in mean birth weight among black women from lowest to highest quintile of kilocalorie expenditure levels

Trimester 2		
	Birth weight (x)	SD
Quintile 1	3108 g	924.96 g
Quintile 2	3288 g	257.42 g
Quintile 3	3401 g	566.67 g
Quintile 4	3090 g	873.09 g
Quintile 5	2994 g	489.41 g
Trimester 3		
Quintile 1	3409 g	606.87 g
Quintile 2	3276 g	653.13 g
Quintile 3	3164 g	388.61 g
Quintile 4	3245 g	555.39 g
Quintile 5	3150 g	565.64 g

Other characteristics in the univariate analysis which were significantly related to birth weight by race are presented in Table 8. Among blacks, maternal height, history of previous live birth >5 pounds, third trimester weight gain, and overall weight gain were significantly related to birth weight. For whites, maternal height, living with spouse/partner, smoking, parity, previous live birth >5 pounds, previous miscarriage, third trimester weight gain, and overall weight gain were significantly related to birth weight.

TABLE 8

Characteristics significantly related to birth weight in the univariate analysis, by race, in the physical activity and birth weight study, University of Pittsburgh, 1988-1990

Characteristic	<u>Blacks</u>		<u>Whites</u>	
	Correlation	p-value	Correlation	p-value
Maternal height	.25	.008	.25	.008
Live-in partner	-	-	-.18	.043
Smoking	-	-	-.34	<.001
Parity	-	-	.18	.043
Live birth >5 lbs.	.19	.037	.20	.025
Miscarriage	-	-	-.24	.010
Trimester 3 weight gain	.29	.003	.19	.036
Total weight gain	.49	<.001	.35	<.001

Because of the small numbers of premature infants in this study, it was not possible to evaluate properly the effect of physical activity on prematurity. However, an attempt was made to assess differences in physical activity levels in the first trimester between women

who delivered prematurely and those who went on to have term pregnancies. The mean weekly kilocalorie expenditure for women who delivered prematurely was 14,664 kcal; for women who went to term it was 9551 kcal ($p=.235$). Race specifically, white women who delivered prematurely had mean first trimester average weekly kilocalorie expenditures of 17,535 kcal compared to term pregnancy value of 9920 kcal ($p=.075$). In blacks, there was no significant difference ($p=.804$). Due to incomplete data collected in those women who delivered prematurely in the second trimester, it was not possible to evaluate this relationship in the later stages of gestation.

In the multivariate analysis, the same pattern of a relationship in blacks but not in whites continued to be borne out. Average weekly kilocalorie expenditure level per trimester was the physical activity variable entered into the models, along with gestational age, maternal height, pre-pregnant weight, gestational weight gain, and smoking. As shown in Table 9, physical activity levels did not remain in the model for whites in either trimester. This was so regardless of inclusion or exclusion of the white premature infants. When the premature infants were included in the sample, the independent predictors were gestational age, smoking, weight gain, and pre-pregnant weight in both the second and third trimesters. However, when the premature infants were excluded, smoking became the most important predictor in both trimesters, and weight gain remained an independent predictor in both trimesters as well.

In the black sample, however, a much different set of predictors emerged, depending on the inclusion or exclusion of the black premature infants. Firstly, when they were included in the model, gestational age, weight gain and pre-pregnant weight were the only predictors in both the second and third trimesters. It should be noted that in the second trimester model (Table 10), overall activity level fell out at $p=.13$. In the third trimester, overall activity was marginally significant at .08.

However, when the premature infants were excluded from the sample, overall weight gain and pre-pregnant weight continued to contribute, but overall physical activity remained in the model for trimester two, and just missed remaining in the trimester three model ($p=.053$).

Finally, data were collected on both pregnancy related and non-pregnancy related illnesses or conditions during pregnancy, by trimester. There was no relation between any of these conditions and decreased birth weight, nor any relation to physical activity levels.

In order to explore the black/white differences in the activity-birth weight relationship, the effect of household activity and birth weight was evaluated in terms of employment status in the two groups. This univariate analysis revealed that house work was significantly inversely related to birth weight in both races only when the woman was employed outside of the home during pregnancy, but terminated her employment during the second or third trimester. In a regression model including household activity in the third trimester as the physical activity variable, it was a significant predictor of birth weight among black women.

SIGNIFICANT FINDINGS

1. Average weekly kilocalorie expenditure levels in the second and third trimester was an independent predictor of birth weight in black women but not in white women.
2. The significant inverse relationship between housework and decreased birth weight was observed in both races among women who were employed outside of the home but terminated their employment in the second or third trimester, as compared with women who worked up until the time of delivery.
3. The data suggested that among white women, a mechanism through which physical activity may influence birth weight is by decreasing gestational length.
4. The black/white differences in the physical activity-birth weight relationship requires further study in a large sample with greater variability in gestational lengths.

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Articles:

Aaron DJ, Kriska AM, Sweeney AM, LaPorte RE: Reliability of a Survey to assess Physical Activity Levels during Pregnancy (Submitted)

Aaron DJ, Sweeney AM, Kriska AM, LaPorte RE: Relationship between Physical Activity during Pregnancy and Low Back Pain (Submitted)

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Sweeney AM: The Effect of Physical Activity during Pregnancy and Birth Weight, Ph.D. Thesis, University of Pittsburgh, 1991 (Manuscript in preparation)

Aaron DJ: Reliability of a survey to assess Physical Activity during Pregnancy, Masters Thesis, University of Pittsburgh, 1991

Ciocca CG: The Effects of Caloric Intake and Macronutrient Intake during Pregnancy on Gestational Weight Gain and Birth Weight, Masters Thesis, University of Pittsburgh, 1991 (Manuscript in preparation)

PARTICIPANT # _____

INTERVIEW DATE _____

WEEK OF GESTATION _____

 PHYSICAL ACTIVITY QUESTIONNAIRE

 Interviewer Code ☐ Reliable test? (1=yes, 2=no) ☐ Age _____ Weight (kgs) _____

- 1) In general, about how many hours per week did you regularly participate in sports and other vigorous physical activities (excluding walking and time spent in school physical education classes)?

...during junior HS/HS age 12-18 (ask if over 14)		
age 19-24 (ask if over 21)		
age 25-30 (ask if over 27)		
...during your first trimester		
second trimester		
third trimester		
past week		

- 2) Did you ever compete in an individual or team sport (not including any time spent in sports performed during school physical education classes)?

 If yes, how many total years did you participate in competitive sports? ☐☐

- 3) Have you ever had a job that required physically demanding work?

 If yes, how many physically demanding jobs have you ever held? ☐☐

 What is the total number of years that you have worked in these physically demanding jobs? (sum of years spent in jobs mentioned above) ☐☐

- 4) Have you ever spent any time confined to a bed or chair for greater than one month as a result of an injury or an illness?

 If yes, how old were you when you first became confined to a bed or chair? ☐☐

 During the time you were confined to the bed or chair, how long did this confinement last? (weeks) ☐☐

- 5) In general, about how many hours per day did you spend watching television?

...during your childhood years		
junior HS/HS years age 12-18		
age 19-24		
age 25-30		
...during your first trimester		
second trimester		
third trimester		
past week		

ACTIVITY SURVEY : LEISURE ACTIVITIES

[illegible]

ACTIVITY CODES	
Walking for Exercise ...02	Swimming (laps).....24
Canoeing.....03	Bicycling.....25
Bowling.....04	Jogging.....26
Table Tennis.....05	Running.....27
Fishing.....06	Social Dancing.....28
Archery.....07	Aerobic Dancing.....29
Golf.....08	Hiking/backpacking...30
Horsebackriding.....09	Gardening/Yardwork...31
Weight Lifting.....10	Downhill Skiing.....32
Ice Skating.....11	Cross-Country Skiing...33
Roller Skating.....12	Other _____34

ACTIVITY SURVEY : OCCUPATIONAL ACTIVITIES

[illegible]

*If unemployed/retired (), or housewife (), during all or part of the past year, list as such, and probe for job activities of a normal 8 hour day (excluding leisure activities).

[illegible]

#If more than 4 jobs, list the four longest jobs.

LIGHT ACTIVITIES
(includes standing, slow walking
and all sitting activities)

Sitting	Writing
Standing	Typing
Light Cleaning-	ironing, cooking, washing, dusting
Slow leisure walking	

MODERATE ACTIVITIES
(includes most indoor activity)

Carrying light loads (5-10lbs)
Continuous walking
Heavy cleaning- mopping, sweeping
scrubbing, scraping
Gardening- planting, weeding
Painting

HARD ACTIVITIES
(includes heavy industrial work
most outdoor construction,
heavy farming)

Carrying moderate to heavy loads
Shoveling Heavy Construction
Farming—hoeing, digging, moving
Chopping (ax) Saving

On the average, how much time per day did you spend doing vigorous chores such as scrubbing floors, vacuuming, sweeping, washing clothes, etc?

...over the past trimester Hours _____ Minutes _____

...over the past week Hours _____ Minutes _____

On a typical day at work, how much time do you spend sitting?

Hours _____ Minutes _____

On a typical day at work, how much time do you spend standing still?

Hours _____ Minutes _____

On a typical day at work, how much time do you spend actually lifting or carrying heavy objects > 10 lbs.? (including children)

Hours _____ Minutes _____

On a typical day at work, how much time do you spend walking?

Hours _____ Minutes _____

WALKING ACTIVITY

During the past week, how many flights of stairs did you climb up each day?

(assuming 10 steps = 1 flight) _____

During the past week, how many city blocks did you walk each day?

(assuming 12 blocks = 1 mile) _____

GENERAL HEALTH

During the past trimester, how many cigarettes did you smoke per day?

_____ cigarettes

During the past trimester, how many alcoholic beverages did you drink per week?

_____ drinks

During the past trimester, did you:

BEST AVAILABLE COPY

1. Suffer from any non-pregnancy related health problems? If yes, describe illness and treatment: _____

2. Suffer from pregnancy related health problems? If yes, describe illness and treatment: _____

3. Change any of your eating habits? Check one:
☐ eating less
☐ eating more
☐ eating about the same

How do you perceive your activity level as compared to:

- Other pregnant women? ☐ less than ☐ the same as ☐ more than
- Non-pregnant women? ☐ less than ☐ the same as ☐ more than

APPENDIX B

Calculations for physical activity kilocalorie levels

1. Leisure time activities:

light = 5.0 kcal

moderate = 7.5 kcal

heavy = 10.0 kcal

$(\text{months/trimester}) * (\text{weeks/month}) * (\text{times/week}) * (\text{hours/time}) / 12 =$
hours per week

Sum all individual activity scores for total leisure kilocalories
per week

2. Occupational activity:

light = 0 kcal

moderate = 5.0 kcal

heavy = 7.5 kcal

$(\text{months/trimester}) * (\text{weeks/month}) * (\text{days/week}) * (\text{hours/day})$ of
moderate activity/12 = hours/week of moderate activity
moderate hours*5.0 kcal*60 = Kcal/week moderate activity

$(\text{months/trimester}) * (\text{weeks/month}) * (\text{days/week}) * (\text{hours/day})$ of
heavy activity/12 = hours/week of heavy activity

heavy hours*7.5 kcal*60 = kcal/week heavy activity

Sum moderate + heavy kilocalories = occupational kilocalories/week

3. House work activity:

$(\text{months/trimester}) * (\text{weeks/month}) * (5 \text{ days/week}) * (\text{hours/day})$ of
vigorous chores/12 = hours/week vigorous chores
hours/week*5.0 kcal*60 = kcal house work/week