

## THE EFFECT OF A MONOTONOUS DIET ON THE EATING HABITS OF PRESCHOOL CHILDREN

THESIS FOR THE DEGREE OF M. S. Patricia Lucille Nordholm 1932

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THE EFFECT OF A MONOTONOUS DIET ON THE EATING HABITS OF PRE-SCHOOL CHILDREN



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By

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of

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### THE EFFECT OF A MONOTONOUS DIET ON THE EATING HABITS OF PRE-SCHOOL CHILDREN

#### CHAPTER I

#### INTRODUCTION

Nature and Purpose of the Study.

The purpose of this experiment was to study the eating habits of pre-school children and in particular to determine the effect of a monotonous diet on their behavior at meal times.

Two boys, Don and Bill (ages four years and nine months and four years and seven months respectively), were chosen for the subjects of this study. The eating habits and health of the children were ascertained before the experiment started. Both Don and Bill were found to be excellent eaters, and had no food dislikes. According to the physical and medical reports of the boys in December of 1931, they were in perfect physical condition. Feither had a record of a cold or illness for two months preceeding the experiment which ran from January 23 to March 5, 1932.

The children lived in the apartment of the Home Economics building through-out the experiment, and followed a normal nursery school proceedure. Certain definite periods of the day were given to meals, sleep and toilet, etc. They had their morning play period out of doors with the nursery school group, and a special effort was made to keep the children out of doors from two to three hours in the afternoon as well. Records were kept which included not only

hours of stred, t diet on Review o Sev be repor complete Tur years of a defini tion at childre: 7el for ettentic during f during , lidst of ; te had ; Careful. Were ei sepool; the pro . e oorered profile eest de the tra Pertici hours of sleep, time spent out of doors, and food consumed, but also to determine the effect of a monotonous diet on their behavior at meal times.

Review of Literature.

Several experiments similar in nature to the one to be reported in this thesis (chapters II and III) had been completed at the University of Chicago.

Tupper (1) made a study of children from four to five years of age in order to submit to scientific investigation a definite type of training designed to improve concentration at meal times, as well as food intake of pre-school children. A profile method, using the ten-second interval for determining whether the children were in or out of attention, was employed to measure their concentration during the lunch period. The food eaten was recorded only during a thirty-minute period. If the child was in the midst of dessert, the amount consumed was estimated. If he had not finished his plate the food left was measured carefully and subtracted from the food served. Her subjects were eight children from the University of Chicago nursery school; the better eaters composed the control group, and the problem eaters the experimental group. The experiment covered a period of twelve weeks, during which time 150 profile studies were made. Conference periods were held each day before lunch and consisted of a discussion between the trainer and the children of past performances and the participation of the children in setting up a new standard

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for the next meal.

The findings gave evidence of the value of the training period in that the experimental group increased their average caloric intake from 348 to 481 or 37 percent, and concentration from 42.5 to 75 percent or an increase of 76 percent. These data are comparisons of the averages of two series, three half-hour studies on each subject. The first three studies were made before training was given, and the last three after six weeks of training, with menus identical in each case. The control group decreased in calories 10 percent and in concentration 8 percent.

Tupper concluded that definite and systematic training is effective in increasing food intake and percent of concentration in children of four and five years of age; that when systematic, consistent training is being carried on, necessary stimulation during a meal will be reduced as time goes on; and finally that children of this age may be stimulated to increased food intake with less effort than behavior or concentration can be controlled.

Ball (2) used a modification of the profile method employed by Tupper to compare the concentration at meals and the food intake of a small group of pre-school children under home versus nursery school conditions. She noted the effect of different experimental procedures instituted with this group at the nursery school upon the food intake and concentration.

She concluded that both the concentration and food

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intake of children were improved by controlled eating conditions such as are to be found in the nursery school. There appeared to be little difference in the concentration of children during meals, whether seated in groups or at separate tables, though their general attitude and behavior were improved by the latter arrangement, namely, less prodding and urging were necessary to keep the attention of children centered on the business of eating.

Lewis (3) made a study of daily variations in food consumption and eating habits of three pre-school children while living at the nursery school for fourteen consecutive days.

The factors studied pertinent to the present study were:

(1) Total calories consumed by the individual children in relation to total time at meals.

(2) Variations in the behavior of the children from meal to meal in a given day and from day to day throughout the period as measured by percentage concentration.

This investigation showed the following results:

(1) Thirty minutes seemed to be a reasonable estimate of the time taken to complete dinners, while breakfasts and suppers required from 15 to 25 minutes. The children spent on the average 75 percent of this time at the business of eating.

(2) There was no definite correlation between the number of calories taken and either the duration of the

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meal or the percentage concentration.

Critical Analysis of the Profile Method.

In the experiments by Tupper, Ball and Lewis, which have been discussed above, the writer finds reason to criticize the profile studies in regard to training of recorders, evidences of the degree of objectivity of method and of the reliability of the sample.

Tupper indicated that when two of her recorders observing the same child reached a percentage agreement of total concentration periods of above 95 percent, they had reached a sufficient degree of objectivity in their classification of the subject's behavior to produce reliable records. Ball considered an agreement of above 90 percent reliable. This percentage agreement might be high enough, but the question arises as to how long they were required to maintain this agreement before their records were accepted as valid. No indication was given that the recorders checked during the experimental period to determine whether they maintained this high degree of objectivity while records were being made. The percentage agreement they obtained was calculated on the total periods of concentration of one recorder, against total periods of concentration of another, when observing the same child. This method is valuable, but does not check on the agreement of the recorders, period by period. They might check very closely on total number of concentration periods in any given meal, yet disagree considerably on the place-

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ment of individual points. Therefore the placement method is more highly objective, since the two records are checked one against the other for agreement on each ten-second period during the meal. For example the records in Chart I taken from the learning period of the present study, show that recorders A and B on records taken simultaneously, had exactly the same totals for concentration, giving a percentage agreement of 100 percent; yet disagreeing on seven points when the two records were checked for the placement of the individual judgments during each period through-out the meal.

#### CHART I

PROFILE RECORDS TAKEN SIMULTANEOUSLY BY RECORDERS A AND B SHOWING DISAGREEMENTS IN PLACEMENT OF INDIVID-UAL JUDGMENT AND AGREEMENT IN TOTAL PERIODS OF CONCENTRATION

		11	1in	<b>n.</b> '	2	M:	n	3	<u>m:</u>	n	4	M	7	5	グ	'n	6	M	in	[	_
Recorder A				D٤	٩y					D	at	e			Ī	M	a	1			
Mihutes						1															
Concentration Periods	3																				
Eating Periods																					
Fruit	3		•			1															
Cereal	15				•	•								•	•	•	•	•	•		
Toast	10							•		•	•	•••	•								
Milk																					
Serving Periods	5		6	\$			0		Θ					D							
Concentration Totals	33																				
Distraction Periods	3			(	D (	Ð			C	2											
Total	36																				
		-			-			-			-	-	-	-			-	_	-		_

#### CHART I continued

#### PROFILE RECORDS TAKEN SIMULTANEOUSLY BY RECORDERS A AND B SHOWING DISAGREEMENTS IN PLACEMENT OF INDIVID-UAL JUDGMENT AND AGREEMENT IN TOTAL PERIODS OF CONCENTRATION

	1	Mi	n.	12	M	in.	3	Mi	n	4	Mi	n	5	M	in	6	M	n.	1	
Recorder B	F	-		De	y				1	Da	te	10	0		M	e	al	12	1	
Minutes	T	1	I						1		1	1			1		1			
Concentration Periods	T						1							26			10	0.1		
Eating Periods	1	T																		
Fruit	1.																			
Cereal 14		T	0											•				-		
Toast	1		T									•	0							
Milk	1						1					Γ								
Serving Periods		T		0	D				0						Γ					
Concentration Totals 22	T	T					1					Γ			Γ					
Distraction Periods 3	1	10	D			0	1	0												
Total 36		Γ																		
																				-
		1					1													

Thus by the placement method of judging the objectivity of the two recorders, the percentage agreement was found to be only 80.5, since out of a total of 36 decisions they agreed 29 times.

In the studies by Tupper, Lewis, and Ball there were no indications as to whether they had sufficient records to give reliable results on the subjects used. Tupper obtained 150 profile records on eight children over a period of twelve weeks. Lewis reported records for breakfasts, lunch and supper on three children for a period of two weeks, and Ball obtained records for lunches at home and at the nursery school on seven children for a period of six 0 Disagreements in placement. weeks. In any one of these cases the number of records may have been sufficient to produce a reliable sample, but no statement was made concerning this factor.

With these points in mind the writer has attempted to test out new methods in regard to training of recorders, degree of objectivity of the profile method and reliability of the sample. These findings will be reported in the succeeding chapter. Descrip Du recorde by Tupy and Let corded child' vision includ preper Sittin tracti ( record every Π. 

#### CHAPTER II

OBJECTIVITY AND RELIABILITY OF THE STUDY Description of the Method.

During each meal the activities of the children were recorded by the profile method, similiar to the one used by Tupper (1) and identical with the one used by Ball (2) and Lewis (3). By this means the child's behavior was recorded at ten-second intervals through-out the meal. The child's activities were classified under the two main divisions of concentration and distraction. Concentration included actual time spent in eating and serving, namely, preparation of the food, being served, or table courtesies. Sitting, playing, and talking were all included under distraction.

One-fourth inch checked paper was used for these records, each square representing twenty seconds, and every minute interval being ruled off as indicated in Chart II.

#### CHART II

#### SAMPLE OF PROFILE RECORD

				Min	11	2	Mir	1	1 3	M	lir	1	II		4	M:	n	
Concentration	Fotal	18	1	1	1		-	T	120				T					T
Toast								T			T	T	T					T
Cereal					Π			T				T						T
Orange juice					I			T				T	1					T
Milk		I			T			T			1	T						
Serving		T			T			T			T	T						T
Distraction		1	1		1			T			1	T	1	T				1

An inch was allowed below the distraction column on each record for recording anything of particular interest that might give a more complete picture of the child's behavior. In addition to checking the concentration and distraction of the child, such stimuli as he received during the meal were recorded. This was accomplished by placing a number on the profile in the proper minute interval, and on a separate card opposite the same number the nature of the stimulus and response of the child were recorded. (Chart III)

#### CHART III

SAMPLE OF	STIMULI	CARD	USED
-----------	---------	------	------

Name	of	Ch	i ld	Meal	Da	y	Date	Serial	Nun	ıber
What	Ch	ild	Was	Doing	Nature	of	Stimulus	Respo	nse	ofChild
1.										
2.										
3.										
								_		

The Learning Period.

For three weeks preceding the experiment a preliminary training period was carried on in the nursery school. The recorders A, B and C were trained by D, who had previously used this method in a study. Their records were checked against hers period by period through-out the meal as to whether they classified the child's activities under eating, serving or distraction.

Table I shows the percentage agreement by the placement method of recorders A, B and C against D during the third week of the learning period in which the three recorders checked the child's activities independent of the trainer and of one another. Out of a total of fifteen records none were below £2.4 percent while over half were above 90 percent. The average percentage agreements in placement for A, B and C with D were 93.5, 88.6 and 92.5 respectively. Thus Table I shows that over a period of five successive days the three recorders were able to maintain a fairly high degree of objectivity when their agreements were checked period by period.

#### TABLE I

		Recorders		
Days	A	В	C	
1	100 <b>.0</b>	90.0	96 <b>.6</b>	
2	98 <b>.6</b>	97.2	97.2	
3	94.4	82.4	87.0	
4	90.6	83.3	92.7	
5	84.1	90.0	89.1	
Average	93.5	88 <b>.6</b>	92.5	

PERCENT AGREEMENT IN PLACEMENT OF RECORDERS A B AND C AGAINST D DURING LEARNING PERIOD

When the less critical method used by Tupper and Ball for determining the objectivity of the recorders was applied, (namely the agreement on total periods of concentration), the degree of objectivity displayed by A, B and C was considerably higher than by the placement method. Table II shows the percentage concentration of the subject when observed simultaneously by the recorders during the learning period. On no day did they differ by 5 percent, while the averages of each for the five day period were practically identical.

TA	BLE	II
		_

PERCENTAGE OF CONCENTRATION ON SUBJECT WHEN OBSERVED BY A B C AND D DURING THE LEARNING PERIOD

Day	A	В	С	D
1	95.0	96 <b>.</b> 7	95.0	95.0
2	100.0	100.0	100.0	100.0
3	84.2	83.3	84.2	85.4
4	89.6	88 <b>.5</b>	88 <b>.5</b>	89.6
5	87.5	88.3	85 <b>.0</b>	87.5
Average	91.3	91.4	91.0	91.4

Expressing this same measure of the objectivity of the three recorders in terms of percentage agreement with the trainer (Table III) it can be seen that in no case did they drop below 95 percent. However, it must be pointed out that while Table IV shows that the percentage agreements on total concentration periods gave higher figures than by the placement method, the latter was a more diagnostic measure of the objectivity of the recorders.

#### TABLE III

PERCENT AGREETENT ON CONCENTRATION OF SUBJECT DURING LEARNING PERIOD USING D AS STANDARD OF COMPARISON

Dav	A	В	С
l	98.2	100.0	100.0
2	100.0	100.0	100.0
3	97.8	98 <b>. 9</b>	98 <b>.9</b>
4	98.8	98 <b>.8</b>	100.0
5	99 <b>.</b> 1	97.1	100.0
Aver age	98.8	99.0	99.9

#### TABLE IV

COMPARISON OF THE PLACEMENT METHOD WITH THE PERCENTAGE CONCENTRATION METHOD FOR JUDGING THE OBJECTIVITY OF THE RECORDERS

Methods for Judg- ing the Percentage Agreement of the Recorders	Total Number of Records	Range of the Percentage Agreements for the Recorders	Number of Per- centage Agree- ments above 95 Percent
Placement	15	82.4-100	5
Total Concentratio	on 15	95-100	15

Objectivity of the Recorders During Experimental Period.

After three weeks of preliminary training, recorders A, B and C began taking records on the two experimental

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subjects. It was thought best to have recorder A take records on Don and B on Bill continuously, while C checked A and B on alternate days through-out the experiment, in order to determine whether the same degree of objectivity could be maintained by the recorders over a long period of time.

Table V shows the percentage agreement in placement of A against C during the entire experimental period. Out of the sixty records half showed a percentage agreement above 95 percent, and over three-fourths were above 90 percent agreement.

Table VI shows the percentage agreement in placement of B against C during the entire experimental period. Out of 58 records practically half showed a percentage agreement above 94 percent, and over three-fourths were above 90 percent agreement. It can be seen from these tables that even with this highly objective method of checking one recorder against another, they were able to maintain as consistent a degree of objectivity as they displayed in the learning period.

While the percentage agreement on total concentration periods was less accurate, in light of the fact that this was the measure of reliability used by previous workers, it was thought interesting to show how the periods of concentration checked for percentage agreement. Table VII shows the percentage agreement on concentration for A against C. Out of 60 records, all but two were above 95

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Day	Breakfast	Lunch	Supper
3	90.5	87.4	96.6
5	87.7	95.0	90 <b>.0</b>
7	95.6	78.9	86.2
9	95.2	83.8	86.0
11	95 <b>.9</b>	96 <b>.1</b>	90.7
13	92.8	93 <b>.</b> 5	90.3
15	98 <b>.0</b>	92.3	98 <b>.6</b>
17	93.0	95.9	94.4
19	97.6	94.4	93 <b>.3</b>
21	86.5	95 <b>.7</b>	94 <b>.1</b>
23	93 <b>. 9</b>	97.8	97.3
25	94.6	99 <b>.1</b>	91.0
27	96 <b>.7</b>	90.8	90.7
29	96.4	96 <b>.3</b>	97 <b>.9</b>
31	99.1	97.2	98 <b>.0</b>
33	100.0	95.0	96 <b>.1</b>
3 <b>5</b>	100.0	88 <b>.1</b>	95.4
37	97.7	98 <b>.7</b>	95 <b>.7</b>
39	95.6	92 <b>.4</b>	97.70
43	95.2	96.7	100.00

95.1

Average

94.0

93.3

PERCENT AGREEMENT IN PLACEMENT OF A AGAINST C DURING EXPERIMENT

TABLE V

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#### TABLE VI

Day	Breakfast	Lunch	Supp <b>er</b>
4	86.9	90.1	94.7
6	86 <b>.9</b>	87.8	85.6
8	77.8	88.5	91.4
10	86.0	92.1	82.1
12	82.3	94 <b>.7</b>	87.6
14	89.8	90.2	88.1
16		71.4	*
18	92.9	93.4	91.8
20	87.8	92.5	91.9
22	97.3	100.0	96.8
24	97.0	98.2	96.2
26	97.1	92.9	100.0
28	93.8	96 <b>.7</b>	95.6
30	98.6	97.3	98 <b>.9</b>
32	98.4	98.6	99.0
34	98.6	54.1	96.8
36	95 <b>.7</b>	97.0	98 <b>.1</b>
38	100.0	87.6	90.9
40	94.4	94.8	94.6
42	91.1	93.0	89.1
Average	92.2	90.5	93.1

PERCENT AGREEMENT IN PLACEMENT OF B AGAINST C DURING EXPERIMENT

\* Bill ill.

#### TABLE VII

Day	Breakfast	Lunch	Supper
3	<b>9</b> 8 <b>. 4</b>	99.0	98 <b>.9</b>
5	100.0	97.1	94.8
7	98.6	96.2	100.0
9	98.3	98.9	96.2
11	98.6	99.2	95.0
13	98 <b>.</b> 5	97.8	100.0
15	98.8	95.6	97.2
17	92.5	99.0	97.5
19	88.1	100.0	95.0
21	98 <b>.9</b>	100.0	97.4
23	100.0	99.0	99.3
25	81.6	98.9	100.0
27	98 <b>.0</b>	<b>96.</b> 6	98.l
29	100.0	98.4	97.9
31	100.0	100.0	100.0
3 <b>3</b>	100.0	100.0	100.0
35	100.0	94.9	98.4
37	97.3	95.4	100.0
39	97.6	96.1	98 <b>.1</b>
43	96.2	100.0	98 <b>.3</b>
Average	97.1	98.1	98 <b>.1</b>

PERCENTAGE AGREEMENT OF A AGAINST C FOR PERCENT OF CONCENTRATION DURING EXPERIMENTAL PERIOD
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percent. Of the fifty-eight records in which B checked against C (Table VIII) the agreement was equally high. The correlation coefficient for A against C was .905  $\pm$ .025, and for B against C was .925  $\pm$ .019.

Thus by this measure which had been u ed in previous studies, as well as by the placement method, it was demonstrated that these recorders were able to maintain a high degree of objectivity through-out the experimental period.

Agreement of the Subjective Method with the Profile Method.

In the profile method the percentage concentration was used as a measure of the child's application to the business of eating. Lewis found that a child who was considered an excellent eater showed a percentage concentration of 85 percent, or above, and a good eater was somewhere between 65 and 85 percent. On this basis it might be assumed that a fair meal would show a concentration somewhere between 50 and 65 percent, and that anything below 50 percent could be considered a poor meal.

It was thought that it might prove interesting to determine to what extent a subjective rating of a person who was accustomed to eating with groups of pro-school children would agree with the profile method in classifying the childrens' eating as excellent, good, fair, or poor.

\* Mean = Guess + Correction =  $\frac{\xi F \chi}{N}$   $\int_{t=1}^{t} \frac{\xi F \chi \gamma - N \frac{\xi F \chi}{N}}{N \sigma_{\chi} \sigma_{\gamma}}$ 

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# TABLE VIII

Dey	Breakfast	Lunch	Supper
4	97 .7	100.0	100.0
6	100.0	96.5	98 <b>.9</b>
8	96.9	98.8	98.8
10	98.6	93.4	97.6
12	95 <b>.7</b>	98 <b>.7</b>	98.9
14	98 <b>.7</b>	99.4	98.9
16		100.0	
18	94.4	98.5	96.1
20	98.4	98.8	99.0
22	100.0	100.0	98 <b>.9</b>
24	96.7	98.9	100.0
26	100.0	98 <b>.7</b>	100.0
28	95.3	100.0	100.0
30	98.3	<b>9</b> 8 <b>.3</b>	100.0
32	98.4	98.6	98.8
34	100.0	100.0	98 <b>.</b> 9
36	100.0	100.0	98 <b>.7</b>
<b>3</b> 8	100.0	98.3	96.4
40	96.9	100.0	96.5
42	93.8	<b>98.4</b>	96.1
Average	97.9	98.8	98.6

PERCENTAGE AGREEMENT OF B AGAINST C FOR PERCENT OF CONCENTRATION DURING EXPERIMENTAL PERIOD During the entire experimental period the writer sat at the table with the children and after each meal made a subjective rating on the four point scale, namely, Excellent, Good, Fair and Poor. The rating was probable highly subjective since the writer was a participant in each meal, in that it was her responsibility to control the behavior of the children, and to secure their cooperation in consuming the experimental diet.

In order to compare the findings of the profile method with the subjective rating it was found necessary to group the percentage concentrations into intervals which would set them equal to the four point scale used in the subjective rating. Table IX below shows the numerical intervals (based partially upon the findings reported by Lewis) which were used in grouping the profile records.

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NUMERICAL INTERVALS USED TO SET PERCENTAGE CONCENTRA-TION EQUAL TO THE FOUR POINT SUBJECTIVE RATING SCALE

Subjective Rating	Range of Percentage Concentration Comparable to Points on Subjective Rating
Excellent	85-100
Good	65-85
Fa <b>ir</b>	50-65
Poor	Below 50

When a comparison was made between these two methods

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of judging the eating habits of the subjects, it was found they agree somewhere between 70 and 75 percent of the time. In the case of Don, Table X shows that out of a total of one hundred and twenty meals, the subjective rating agreed with the percentage concentration rating 84 times, while with Bill, Table XI shows that out of one hundred and eighteen meals, the subjective rating agreed with the percentage concentration eighty-nine times. In the cases where the subjective judgments did not agree with the percentage concentration ratings, the subjective judgment was lower on the four point scale than the percentage concentration rating. This seemed to indicate that there was some factor other than the child's application to the business of eating, which entered into the writer's subjective evaluation of the meal.

It was found (Table XII) that when the subjective rating disagreed with the profile rating of a meal by one point, the average number of stimulations given the child were from two to three times as many as when the two ratings agreed. It would appear, therefore, that the writer's judgment of the meal was influenced not only by the child's application to the business of eating, but also the number of times he required stimulation. Hence in the use of the profile method as a measure for judging the success of the meal it would be necessary to evaluate it not only in terms of concentration, but also in terms of the number of stimulations given the child.

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# TABLE X

-22-

	Br	eakfa	st	L	Lunch			Supper			
Day	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Subjective Reting		
45678901123456789011234567890112345678901233456789012334567890123335567890123335567890123345567890123345567890123335567	97.2 90.4 100.0 98.6 93.0 95.1 93.3 93.2 100.0 94.2 87.0 87.0 87.0 87.0 81.7 87.8 86.5 93.2 93.2 93.2 93.2 93.2 93.2 93.2 93.2	변 0 년 년 년 년 년 년 1 1 1 1 1 1 1 1 1 1 1 1 1	<b>ほのまままでののであっていののでののでののでのののののであ</b>	92.3 95.6 83.9 83.2 65.8 89.8 81.0 93.7 83.8 87.9 77.8 76.4 95.9 73.6 95.9 75.8 95.9 85.6 79.3 86.5 87.7 81.7 81.8 83.8 92.0 100.0 100.0 95.8	第2000000000000000000000000000000000000	日本は日本日本のののののののののですの世代はののですのです。	90.8 91.0 97.0 84.4 90.7 96.5 95.9 94.4 93.5 84.0 82.5 72.3 88.9 72.8 84.5 72.3 88.9 72.8 84.5 72.3 88.9 72.8 84.5 72.3 88.9 72.8 84.5 93.5 100.0 90.3 87.5 92.5 100.0 98.0 100.0 98.0 100.0 98.0 98.0 98.0	第555555555555555555555555555555555555	Сносниссоссоссиссиссоссиинииниинии Сносниссоссиссиссиссиссиинииниинии Сносниссиссиссиссиссиссииниининиинии Сноснинининининининининининининининининин		

# COMPARISON OF THE PROFILE RATING WITH THE SUBJECTIVE RATING OF DON'S MEALS

# TABLE X continued

# COMPARISON OF THE PROFILE RATING WITH THE SUBJECTIVE RATING OF DON'S MEALS

	Breakfast			Lu	Lynch			per	
Day	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Sub ject <b>ive</b> Rating
38 39 40 41 42 43	97.7 100.0 100.0 93.8 93.0	<b>E</b> E <b>E E</b> E E	E E E E E E	95.8 100.0 85.4 92.5 90.1 98.0	환 <sup></sup> 또 또 된 된 된	e e e e e	98.3 82.3 90.5 93.3 92.0 87.1	E G E E E	E C E E C

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# TABLE XI

	Bi	reakfa	ast	I	unch		Su	ipper	
Day	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Subjective Rating	Percentage Concentration	Percentage Concentration Rating	Sub jective Rating
4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 1 2 3 4 5 6 7 8 9 0 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	93.3 94.0 95.0 95.0 95.0 95.0 95.0 95.0 93.3 90.2 93.3 90.2 93.3 90.2 93.3 90.2 93.7 90.4 93.3 67.6 70.8 274.6 75.4 75.0 75.0 87.7 80.0 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.6 75.0 80.0 75.0 80.0 75.6 70.8 76.0 75.0 76.0 75.0 80.0 80.0 80.0 80.0 80.0 80.0 80.0 8	E M M M M M M M M M M M M M M M M M M M	80889999999999999999999999999999999999	96.7 93.0 92.7 92.5 89.9 89.3 88.9 91.9 86.1 90.4 78.1 80.9 74.7 80.6 66.9 87.0 78.9 82.0 78.9 82.0 78.4 80.9 82.0 78.4 80.9 82.0 78.4 80.9 82.7 91.5 79.8 83.3 81.9 82.7 91.1 91.7 80.6 80.1 77.2 87.9 84.8	第111日前日前日前日前のののです。	00000000000000000000000000000000000000	94.7 97.0 97.8 93.2 91.3 93.2 91.3 93.2 80.1 87.6 82.9 89.0 75.4 73.0 69.9 68.1 79.3 89.0 87.4 80.0 81.0 85.3 84.9 79.6 83.6 84.3 85.3 82.0 84.3 85.3 82.0 82.0 82.0 82.0 83.2 83.0 83.0 83.0 83.0 83.0 83.0 83.0 83.0	第999999999999999999999999999999999999	000000000000 A000000000000000000000000

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#### COMPARISON OF THE PROFILE RATING WITH THE SUBJECTIVE RATING OF BILL'S MEALS

#### TABLE XI continued

#### Breakfast Lunch Supper Concentration Percentage Concentration Concentration Concentration Concentration Concentration Rating Subjective Subjective Rating Subjective Rating Per centage Percentage Percentage Percentage Percentage Rating Rating Day Rating 95.2 88.9 E E 39 E 73.8 G G 80.2 G G 91.3 62.0 84.8 E Ĝ ĒFG 81.8 40 G E 89.4 87.5 86.7 E F G E 86.7 41 E G 71.8 42 G G E Ē 89.1 Ē 90.2 E E E 43

#### COMPARISON OF THE PROFILE RATING WITH THE SUBJECTIVE RATING OF BILL'S MEALS

#### TABLE XII

	Average M When the Rating Ag the Profi	Numb <b>er</b> Stimuli Subjective greed With Lle Rating	Average Number Stimul: When the Subjective Rating Disagreed With the Profile Rating		
Scale	Don	Bill	Don	Bill	
Excellent	2.0	3.0	6.6	6.7	
Good	6.0	6.5	10.0	13.7	
Fair					

AVERAGE NUMBER OF STIMULATIONS WHEN PROFILE AND SUB-JECTIVE RATINGS AGREED AND WHEN THEY DISAGREED

Reliability of the Sample.

In order to test whether or not the number of records taken on these two children gave a reliable mean, namely, whether an increased number of records on the same children would have caused the mean to vary to any great extent, the probable error was calculated. "It has been found by experience that the occurence of a deviation of more than three times the probable error is either very unlikely, or is due to peculiar influences not covered by the investigation. Hence three times the probable error is referred to as the maximum probable error".\* The following table (XIII) gives a summary of the calculations used in testing the reliability of the sample, composing the present study. The significance of these factors will be discussed below.

\*Forsyth, C. H. Analysis of Statistics Page 156

# -27-TABLE XIII

# CALCULATION USED TO TEST RELIAPILITY OF THE SAMPLE

Name	Total Records	Mean of Concen- tration	Standard Deviation on Concentration	Stand- ard Error	Prob- able Error	Coeffi- cient of Variability
Don	129	90.6	7.4	.65	•44	8%
Bi11	127	83.6	7.6	.67	•45	9%

Don had a mean for percentage concentration of 90.6 and a probable error of .44 which means that if three times as many records had been taken  $(3 \times .44 = 1.32)$  (90.6-1.32) 90.6-1.32 = 89.3) it would not be expected that the new mean would lie outside of the interval 89.3-91.9 since by chance, only once out of every 22 times would it fall outside of this range. In the same way Bill having a mean of 83.6 = 3(.45), it would not be expected that the new mean would fall outside of the interval 82.3-84.9, by chance but once out of every 22 times.

By dividing the standard deviation by the mean times

Mean <u>- Total Concentration</u> number of records
Gor Standard Deviation _ (Deviation from the Mean)
number
Standard Error (Standard Deviation)
number
Probable Error =.6745 x Standard Deviation
number
Coefficient of Variability <u>Standard Deviation</u> x 100
mean

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100, the coefficient of variability was obtained. This factor is significant in that it tells how concentrated the different numbers are around the mean. It has been found that a good variability lies within the range of 10-50 percent. Don's coefficient of variability was found to be 8 percent and Bill's 9 percent. This extremely low variability would indicate the different percentage concentrations were very concentrated around the mean.

From the preceding calculations the writer concludes that the number of records obtained on Don and Bill gave a reliable sample of their behavior at meal times, and that **en** increased number of records up to and including three times as many, would not have caused the mean to vary more than two percent on either side of the present mean.

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#### CHAPTER III

ANALYSIS OF EATING HABITS OF THE TWO SUBJECTS Procedure.

As stated in Chapter I the two subjects Don and Bill lived in the apartment suite in the Home Economics Building through-out the experiment, and the order of the day followed a normal nursery school procedure with two exceptions, namely, the children ate their meals and had their maps in the epartment. Due to the fact that the children were on a metabolic balance study where it was necessary for them to eat all the food given them, special emphasis was put on their meal time procedure, in order to train the children in such factors as sitting quietly at the table, careful handling of food, and minimum amount of conversation. During the first fifteen days of the experiment the subjects received the usual varied diet for preschool children, but during the following 28 days they were fed what might be called a monotonous diet, since each day they ate the following foods:

Food	Weight in	grams Food Weight	in grams
Whole milk	720	Lettuce	14
Farina (uncooked	1) 18	Carrots	72
Orange juice	180	Tomatoes	90
Beef (raw)	45	Butter	18
Egg (raw)	45	Patato	63
Prunes	90	Sugar	18
Applesauce	90	Whole Wheat bread C. L. O	72 4.5

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• • • During the entire experiment of 43 days the recorders took profile records on the children in order to determine whether or not their eating habits were modified by the experimental procedure. Such factors as total time spent at meals, percentage concentration, number of stimulations, and possible correlations between these factors, were studied in relation to the experimental procedure. These findings will be discussed in the present chapter.

Total Time at Meals.

From previous group studies conducted at the University of Chicago, 30 minutes was found to be a reasonable length of time for the completion of noon meals. Lewis found that the children in her study completed 90 percent of all three meals within the half hour.

While Table XIV shows that the time taken by Bill and Don during the entire experimental period of 43 days ranged from 6 to 48 minutes, Table XV shows that out of a total of 256 meals, 253 or 98.8 percent were completed within 30 minutes. In the case of Bill his records show that 125 of his 127 meals were completed within 30 minutes, and that all but one of Don's were completed within the same length of time. On the whole Don was a more rapid eater than Bill since he completed 80 of his meals, or practically two-thirds of them, within 15 minutes, while Bill completed approximately half of his within that same interval.

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# TABLE XIV

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# TOTAL TIME AT ALL MEALS IN MINUTES

	Breel	cfast	Lunc	ch	Supper		
Day	Bill	Don	Bill	Don	Bill	Don	
1	30	21	20	18	16	18	
2	21	15	24	28	19	15	
3	15	<b>1</b> 0	16	23	19	15	
4	15	12	15	17	13	16	
5	11	12	21	23	17	17	
6	10	10	21	27	15	17	
7	10	11	<b>1</b> 5	16	17	18	
8	15	12	16	21	16	18	
9	13	10	20	17	13	10	
10	16	13	32	32	18	16	
11	14	13	21	21	22	<b>1</b> 8	
12	13	9	16	16	18	18	
13	16	11	21	26	21	19	
14	18	16	22	23	21	24	
15	19	17	22	20	29	23	
16	15	12	26	26		15	
17	10	14	24	16	48	27	
18	24	13	30	21	30	18	
19	20	14	15	12	18	15	
20	15	8		12	19	13	
21	18	15	19	20	14	17	
22	13	8	17	19	16	14	

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# TABLE XIV continued

	Brea	ekfast	Lunch		Supper	
Day	Bill	Don	Bill	Don	Bill	Don
23	20	14	22	23	26	25
24	11	10	18	16	22	21
25	21	18	19	18	17	19
26	11	10	18	20	14	20
27	19	10	17	18	18	18
28	14	11	15	15	15	9
29	10	9	16	13	15	8
30	12	9	13	10	15	11
31	11	10	11	12	13	9
32	10	10	12	9	17	12
33	13	9	14	10	19	13
34	12	9	17	12	16	14
35	10	10	15	10	16	11
36	16	11	11	8	17	13
37	10	6	11	7	16	9
38	. 11	7	12	8	13	10
39	10	7	14	9	14	10
40	12	7	13	8	16	10
41	11	6	13	9	13	10
42	9	8	12	12	15	13
43	10	10	14	8	12	12
Avg.	14	11	17	16	18	15

# TOTAL TIME AT ALL MEALS IN MINUTES

#### TABLE XV

requency istribution n Minutes	All Meels			Meals Comulated	Within 30 Minutes		Meals Completed Within 15 Minutes		
AAA	otal	B <b>ill</b>	Don	Total	B <b>ill</b>	Don	Total	Bill	Don
5-10	.54	11	43	25 <b>3</b>	125	128	142	62	80
11-15	88	51	37						
16-20	71	41	30						
<b>21-</b> 25	29	16	13						
26-30	11	6	5						
31 and Above	3	2	1						
Total	256	127	129						

#### DISTRIBUTION OF TOTAL TIME FOR ALL MEALS IN MINUTES DURING ENTIRE EXPERIMENTAL PERIOD

Table XVI shows that the average lengths of time for all breakfasts, luncheons and suppers for Bill were 14, 17 and 18 minutes respectively; and for Don 11, 16 and 15 minutes respectively. From these figures it can be seen that there was no significant difference between the average lengths of time spent by each of the children at luncheons and suppers. These results coincide with the findings in Lewis' study in which breakfasts tended to be the shortest meal of the day, with no appreciable differences between luncheons and suppers.

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Since the experiment ran over a period of 43 days including 15 days on a varied diet and 27 days on a monotonous diet, it was thought interesting to note whether there were significant variations in the time taken at meals during these two dietary regimes.

#### TABLE XVI

AVERAGE NUMBER OF MINUTES TAKEN BY BILL AND DON FOR EACH MEAL OF THE DAY

Name	All Meals	Breakfasts	Luncheons	Supper <b>s</b>
Bill	17	14	17	18
Don	14	11	16	15

Table XVII shows that in the case of Bill there probably was not a significant difference between the average lengths of time taken for meals on the two types of diets, since his average for the varied diet was 18 minutes and for the monotonous period 16 minutes. However, if the percentage of meals completed in 15 minutes im used as a measure of comparison between the two periods, the findings would be in favor of the monotonous diet, since in that case, he completed 57.3 percent of his meals in that interval as against 33.3 percent for the varied diet. In the case of Don, the comparison between the two methods of feeding showed that a shorter length of time was spent at meals during the monotonous diet, from the point of view of the average length of time taken for meals, and the percentage of meels completed in 15 minutes. The average length of time spent by Don at the table on the varied diet was 17 minutes and on the monotonous diet 13 minutes. He likewise completed 77.3 percent of his meals in 15 minutes on the monotonous diet as against 33.3 percent on the varied diet.

#### TABLE XVII

Name	Averag of Min for Me	ge Number utes als	Percenta Meals Co Within I Minutes	ag <b>e</b> of ompleted L5	Percentage of Meals Completed Within 30 Minutes			
	Varied Diet	Monot- onous Diet	Varied Diet	Monot- onous Diet	Varied Diet	Monot- onous Diet		
B <b>ill</b>	18	16	33.3	57.3	97.7	98.7		
Don	17	13	33 <b>.3</b>	77.3	97.7	100.0		

COMPARISON OF LENGTHS OF TIME TAKEN FOR MEALS ON VARIED DIET AND ON MONOTONOUS DIET

From the point of view of total time spent at table, the eating habits of the two subjects in the present study compared favorably with the findings in the studies reported from the University of Chicago. Since with the exceptions of three meals all were completed within 30 minutes. Don was a more rapid eater than Bill, completing practicelly two-thirds of his meals in 15 minutes while Bill completed epproximately half of his in that same length of time. Moreover if the length of time spent at

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the table be used as a measure of the children's interest in their food it would not appear that either of them tired of the monotonous diet.

Percentage Concentration.

While it was considered valuable to make comparisons on the lengths of time spent at the table during the different procedures, it was thought even more significant to know what portion of that time the children spent at the business of eating. Percentage Concentration was defined in Chapter II as the portion of time a child spent in eating plus serving of the food. This factor tells how much of the total time was productively used, as against the time wasted. As stated in the preceding chapter that a child who spent 85 percent of the time or over at the business of eating was considered an "excellent" eater, and that enything between 65 and 85 percent represented a "good" eater.

Table XVIII shows that with one exception the childrens meals were within the range from 65-100 percent or in other words practically all of their eating could be classified as either "excellent" or "good". The generalization expressed above is based upon the fact that Bill's average percentage concentration for the whole study was 83.6 and for Don 90.6 percent. (Table XIX) This same table shows that Bill's distribution of meals in the ranges

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#### TAPLE XVIII

# FERCENTAGE CONCENTRATION FOR ENTIRE STUDY

	Break	cfast	Lunch		Supp	er
Day	Bill	Don	Bill	Don	Bill	Don
l	78	90	75	88	80	83
2	85	90	84	ει	94	94
3	89	<b>9</b> 8	91	73	82	100
4	93	97	9 <b>7</b>	92	95	91
5	94	90	93	96	9 <b>7</b>	91
6	95	100	93	84	98	97
7	93	99	93	83	93	84
8	80	93	<b>9</b> 0	66	91	91
9	94	<b>9</b> 5	90	90	93	97
10	88	93	89	81	80	96
11	90	93	92	94	88	94
12	85	100	86	84	83	94
13	83	94	90	84	89	84
14	<b>6</b> 8	87	<b>7</b> 8	88	75	83
15	71	84	81	<b>7</b> 8	73	72
16	78	92	75	76		89
17	75	89	81	96	70	73
18	77	92	67	74	68	99
19	75	82	87	<b>9</b> 6	81	84
20	67	<b>8</b> 8		96	79	93
21	80	87	79	89	89	86
22	80	94	82	86	87	100

# -38-TABLE XVIII

	Brea	akfest	Lun	ch	Sup	per
Day	Bi <b>ll</b>	Don	Bill	Don	Bill	Don
23	76	73	<b>7</b> 8	79	80	81
24	<b>8</b> 8	93	81	8 <b>7</b>	81	90
25	73	89	81	88	85	88
26	86	<b>9</b> 5	71	6 <b>7</b>	85	87
27	65	87	80	82	80	93
28	75	80	83	82	84	100
29	75	85	82	84	85	100
30	8 <b>7</b>	94	83	92	84	<b>9</b> 8
31	96	100	91	100	85	100
32	90	100	92	100	83	95
33	85	93	80	100	82	96
34	92	96	80	96	84	83
35	93	93	77	100	81	92
36	80	82	88	100	80	96
3 <b>7</b>	86	100	85	98	89	98
38	96	<b>9</b> 8	82	96	70 ·	98
39	95	100	74	100	80	82
40	89	100	82	85	91	91
41	89	100	87	93	62	93
42	88	94	72	90	85	92
43	8 <b>7</b>	93	90	98	89	87
Avg.	84	92	82	89	81	91

PERCENTAGE CONCENTRATION FOR ENTIRE STUDY

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classified as "excellent" and "good" were abovt equal, namely 49.0 and 50.0 percent respectively. In the case of Don it can be seen that he had 78 percent in the interval of 85-100, while the other 22 percent were in the range designated as "good". This difference in percentage concentration which shows up between the two boys in terms of averages as well as in the percentages of "excellent" and "good" meals for the whole study would indicate a significant difference between the two subjects in their ability to attend to the business of eating.

#### TABLE XIX

GROUPING	OF	ALL	MEALS	ACCORDING	ΤO	PERCENTAGE	COM-
			CH	ENTRATION			

Name	Total Number	Average Percentage	Grouping of Meals by Percentage						
	Meals	Concentration	Excellent 85-100		Good	5-85			
		IOT ALL MEALS	Number Meals	Percent Meals	Number Meals	Percent Meals			
B <b>ill</b>	127	83.6	62	49.0	64	50.0			
Don	129	90.6	100	78.0	29	22.0			

When a statistical calculation of the significance of the difference between the means of percentage concentration for the two boys (90.6-83.6=7)\* was made the standard error of the difference was found to be  $7 \pm .93^*$ .

\* 90.6 
$$\pm$$
 .44  
83.6  $\pm$  .45  
7  $\pm$   $\sqrt{.44^2}$   $45^2 = 7 \pm .93$ 

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Since the difference between the two means is considerably more than twice the standard error this variation between the average percentage concentrations of Don and Bill is greater than can be accounted for solely on the basis of chance. Table XX would indicate that this significant difference between the 2 boys in percentage concentration during the entire study was due to their differences in behavior during the monotonous period. On the varied diet (Table XX) the percentage concentration for Bill was 87.1 and for Don 89.2 and the slight difference between these two means was not greater than could be expected by chance since the standard error of the two means was found to be 2.1±2.88\*. However Don's percentage concentration for the monotonous diet was 91.5 as against 81.6 for Bill, making a difference of 9. 5 percent, which does account for the significant difference between the two boys (7 ±.98) reported above since the standard error of the difference of the means was  $9.9 \pm 0.92^*$ . It is of further interest to note (Table XXI) that in the case of Don there was no significant difference between his mean for percentage concentration on the varied diet versus the monotonous

*	Varied Diet	Monotonous Diet		
Don	89.2 ± 1.13	Don	91.5 ± 0.619	
Bill	87.1 ± 2.65	Bill	81.6 ± 0.780	
	2.1 ± 1.13 + 2.65 *		9.9 ± 10.619 <sup>2</sup> +0.780 <sup>2</sup>	
	2.1 ± 2.88		9.9 ± 0.92	

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## TABLE XX

AVERAGE PERCENTAGE CONCENTRATION ON THE TWO DIETS AND PERCENTAGE DISTRIBUTION ACCORDING TO RANGES FOR "EX-CELLENT" AND "GOOD" EATING

Name	Total Number Meals		Average Percentage Concen- tration		Percent of Excellent Meals 85-100		Percent of Good Meals 65-85	
	Varied Diet	Monot- onous Diet	Varied Diet	Monot- onous Diet	Varied Diet	Monot- onous Diet	Varied Diet	Monot- onous Diet
Bill	45	82	87.1	81.9	67.0	39.0	33.0	61.0
Don	45	84	89.2	91.4	67.0	83.0	33.0	17.0

## TABLE XXI

SIGNIFICANT DIFFERENCES FOR DON AND BILL ON PERCENTAGE CONCENTRATION FOR VARIOUS INTERVALS DURING THE STUDY

Na <b>me</b>	varied Diet Against Monotonous Diet	Varied Diet Against First 2 Weeks Monotonous Diet	Varied Diet Against Last 14 Days Monotonous Diet	Varied Diet Against Middle 2 Weeks Monotonous Diet	First 14 Days Monotonous Diet Against Lest 14 Days Monotonous Diet
Bill	5.2±1.80	8.3±2.79	2.3±1.93	4.5±1.87	6.0±1.26
Don	2.2 <u>+</u> 1.7	.8±1.25	6.0±1.35	2.3 <b>±1.</b> 58	5.2 ±1.35

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diet (2.2 ± 1.7). But he did show a significant improvement during the last two weeks when compared with the first two weeks of the monotonous diet (5.2 ± 1.35), as well as with the varied regime (6.0 ± 1.35). In Bills case the difference between the means for percentage concentration under the two regimes (5.2 ± 1.80) was significant and in favor of the veried diet (Table XXI). This might be interpreted to imply that Bill had tired of the monotonous diet. But such an interpretation of his lowered average for percentage concentration is not born out, by the length of time he spent at meals since his average for the varied diet was 18 minutes and for the monotonous diet 16 minutes. A universal tendency among pre-school children. when presented with foods they are reluctant to consume is to slow up their esting, which tendency is directly reflected in the length of time spent at the table.

Further indication of the fact that Bill did not tire of the monotonous diet was brought out by the significant difference between the first 14, and the last 14 days of that period, namely, 6 ± 1.26, (Table XXI) in favor of the last two weeks. If he had tired of the monotonous diet one would not expect a significant increase in the mean for percentage concentration during the last two weeks of the period. There is no objective evidence in the records taken on Bill to account for his lowered percentage concentration during the first two weeks of the monotonous diet.

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It is apparent from the preceding discussion of the significant differences for various intervals during the study that both subjects increased their percentage concentration during the last two weeks of the experiment which gives evidence for the fact that they did not tire of the monotonous diet. It is evident further that, in terms of percentage concentration as well as total time, Don's performances was somewhat better than Bill's.

Stimulation During Mealtimes.

A third measure of a child's reaction toward mealtime procedures may be derived from studying the frequency with which he must be stimulated in order to insure his completion of the meal. The value of this factor as a measure of the subjects eating habits was enhanced by the fact that during the 27 days of the monotonous diet the calories and volumes of food consumed were constant; even on the varied diet the range in calories and volume from day to day was not great. In the present study the number and type of stimulations, were studied in relation to the experimental procedure, nemely, stimulations for the entire study, and for the varied versus the monotonous period.

The stimulations were classified according to whether they pertained to the subjects' eating, or their general behavior at the table and will be discussed under these two classifications.

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Table XXII shows that Don had fewer stimulations during the experiment than the other subject; his total being 151 as against 191 for Bill. During the varied diet the two boys received about the same number of stimulations. namely, 60 for Don and 65 for Bill, but during the monotonous diet Don's total for the four weeks was only 93 as against 126 for Bill. Since the monotonous period was twice the length of the varied diet these figures show that perunit of time the number of stimulations given Don during the monotonous period was decreased, while Bill's remained practically the same. During the varied diet there was an equal distribution of stimuli between those related to eating and those related to their behavior at the table. On the monotonous diet relatively fewer stimuli related to behavior were employed. This reduction is logical, since the children had learned during the first two weeks to be cautious about spilling, about taking too large bites, and also how to sit reasonably quiet at the table.

In the preceding paragraph the total number of stimulations for both subjects during the two periods of diet were discussed. However, it was thought interesting to determine the average number of stimulations per meal on the varied as against the monotonous diet for the two subjects in order to show whether their average per meal decreased or increased during these two regimes.

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# TABLE XXII

PERTAINED TO SUBJECTS' EATING OR GENERAL BEHAVIOR										
Name	rota of S for	l Num timula Entir	ber ations e Period	Tota Stin Vari	l Nu nulat .ed I	umber tions on Diet	Total Number Stimulations on Monotonous Diet			
	A11	Eat ing	Be havior	A11	Eat ing	Be havior	A11	Eat ing	Be havior	
Bill	191	102	89	65	33	32	126	6 <b>9</b>	57	
Don	153	88	65	60	31	29	93	5 <b>7</b>	36	

TOTAL NUMBER OF STIMULATIONS ON VARIED AND MONOT-ONOUS DIET CLASSIFIED ACCORDING TO WHETHER THEY PERTAINED TO SUBJECTS' EATING OR GENERAL BEHAVIOR

Table XXIII shows that Bill had an average number of stimulations per meal of 1.5, against 1.18 for Don during the entire experiment. The average number of stimulations on the varied diet for both boys was approximately the same being 1.44 for Bill and 1.33 for Don. The distribution of the stimulation in terms of those related to eating and those related to behavior was approximately equal during this period. On the monotonous diet Bill's average number of stimuli per meal, (1.53), was slightly greater than for Don, (1.10). During this period, the average of stimuli for each child related to eating, remained approximately the same as during the varied diet. However, in the case of Don the average number of stimuli per meal, related to behavior, was decidely decreased since it was .644 on the varied diet and .428 on the monotonous There was no appreciable change in Bill's two diet.

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averages, since on the varied diet it was .711 and on the monotonous .695.

### TABLE XXIII

AVERAGE NUMBER OF STITULATION PER YEAL ON VARIED AND MONOTONOUS DIET

Neme	Aver of S for 3	age N timul Entir	umber ations e Peric	Ave Sti Dd Var	erage N Imulation	umber ons on et	Average Number of Stimulations or Monotonous Diet			
	All Eat- Be- ing havior		All	Eat- ing	Be- havior	All	Eat- ing	Be- havior		
Bill	1.50	0.80	0.70	1.44	0.733	0.711	1.53	0.841	0.695	
Don	1.18	0.68	0.50	1.33	0.688	0.644	1.10	0.678	0.428	

Correlations Between Factors Related to Time, Percentage Concentration and Stimulations.

The question arose as to whether there were any relationships between such factors as total time taken at meals and its apportionment in terms of concentration and distraction time; or between the number of stimulations given the children and their percentage concentration. The presence or absence of such relationships between two factors can be measured by means of linear correlations. The possible range for correlation coefficients is from 0 to 1; the closer the factors to 1 the more significant the relationships.

One of the interesting problems presented by the present study was to determine what happened to the distri-

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bution of concentration and distraction time when the total time at meals varied. The high correlation coefficient in Table XXIV indicates that when total time at meals was increased it was due to the fact that the children spent not only more time at the business of eating, but in playing as well. The correlation coefficients on total time against concentration time for Bill and Don were

+.917 and +.915 respectively as against +.762 and +.746 for total against distraction time. These coefficients indicate that there was a slightly greater tendency on the part of the boys to extend the meal time because of increased concentration time, than because of distraction time.

TABLE XXIV

CORRELATIONS RELATED TO TIME, PERCENTAGE CONCENTRA-TION AND STIMULATIONS

Name	Total Time Against Con- centration Time	Total Time Against Dis- traction Time	Percentage Concen- tration Against Num- ber of Stimulations
Bill	.917 ± .014	.762 ±.013	.376 ± .077
Don	.915 ±.014	.747 ±.039	.471 ±.071

In stimulating children during meal times the question always arises as to whether the frequency with which they are "poked" bears any relationship to their application to the business of eating. In the case of Bill and Don (Table XXIV) it would appear that there was only a fair positive correlation between these two factors, since the coefficient for Bill was +.376 and for Don +.471. In other words there was a slight tendency for the percentage concentration and number of stimuli to increase simultaneously. Therefore, in these two cases an increase in the number of stimulations had a slight tendency to increase the percentage concentration. However, the relationship between percentage concentration and the number of stimulations bears further investigation since in the present study there was no attempt to control either the number or type of stimulations.

Summary and Conclusion.

This problem was undertaken in order to study the esting habits of pre-school children, and to determine the effect of a monotonous diet on their behavior at meal times.

The profile method was the technique adopted for studying the children's eating habits, and the ten-second interval was used to record the concentration during meal times. This method was identical with the one used by Lewis and, Ball, with the exception that the writer has attempted to improve the method in regard to training of the recorders, determination of degree of objectivity of the method, and the reliability of the sample. In the present study a preliminary training period was carried on in the nursery school for three weeks preceding the experiment, during

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which time three recorders were trained by a person who had previously used this method in an experiment. The degree of objectivity of the records was checked by a new method, namely, the placement method which is more highly objective since it checked one against the other for agreement on each ten-second period during the meal. This method was used for checking the recorders through-out the entire experiment, since a third person checked the two recorders on alternate days during the entire study. By this more objective method it was found that out of 118 records half showed a percentage agreement of above 95 percent and over three-fourths were above 90 percent. Thus it was demonstrated that the recorders could maintain a fairly high degree of objectivity over the six weeks period. The reliability of the sample was determined by statistical calculation in order to denote whether an increased number would have caused the mean to vary to any great extent. Ey this method it was found that of the 129 profile studies made on Don and 127 on Bill, an increased number of records up to and including three times would not have caused the mean of percentage concentration to vary more than two percent on either side of the present mean. It was thought interesting to determine to what extent a subjective rating of a person accustomed to eating with groups of preschool children, would agree with the profile method of classifying the childrens eating. In order to accomplish this, the writer sat at the table during the entire study

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and made a subjective rating of each meal on a four point scale, namely, excellent, good, fair, and poor. This four point scale was set equal to the numerical intervals used for percentage concentration, namely, excellent had a range of percentage concentration of 85-100, good 65-85, fair 50-65 and poor below 50. When a comparison was made it was found that they agreed somewhere between 70 and 75 percent of the time. In the cases where they did not agree it was found that the subjective judgment was lower on the four point scale than the percentage concentration rating, which indicated that there was some factor other than the child's application to the business of eating which entered into the writer's evaluation of the meal. By determining the average number of stimulations it was found that when the subjective rating disagreed with the profile rating by one point, the average number of stimulations given the child were from two to three times as many as when they agreed. Therefore in the use of the profile method as a measure for judging the success of a meal it would be necessary to evaluate it not only in terms of concentration but also in terms of the number of stimulations given the child.

Two boys, Don and Bill between four and five years of age, were the subjects used for this experiment. Proceeding the experiment the eating habits and health of the children were ascertained. The experiment covered a period of 43 days during which time 256 profile studies were made. During ' the first 15 days of the experiment the subjects received

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the usual varied diet for pre-school children, but during the following 28 days they were fed a monotonous diet. During these two periods such factors as total time spent at meals, percentage concentration, number of stimulations, and possible correlation between these factors were studied in relation to the experimental procedure.

Total Time at Meals.

From the point of view of total time spent at the table, the eating habits of the two children compared favorably with the findings in the studies reported from the University of Chicago, since with three exceptions all meals were completed within 30 minutes. The findings also were in favor of the monotonous diet since both subjects increased the number of meals completed in 15 minutes from 33.3 percent on the varied diet to 57.3 on the monotonous diet for Bill and to 77.3 percent for Don.

### Percentage Concentration.

Using percentage concentration as a measure of the child's application to the business of eating it was found that practically all of the children's meals could be classified as either "excellent" or "good". In other words their percentage concentration ranged from 65-100 percent. However, it was found that for the whole study there was a difference of 7 percent between the two subjects for average percentage concentration. When a statistical calculation of

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the significant differences between the two means for percentage concentration was made the standard error of the difference was found to be 7 ±.93, which was greater than could be accounted for solely on the basis of chance. Τt was found that this difference in their behavior was demonstrated during the monotonous period since the standard error of the two means on the varied diet was 2.12 2.88 while for the monotonous diet was 9.9 ± 0.92, which would indicate that the significant difference found between the two subjects (7 t.93) was during the monotonous diet. In the case of Don it was found that there was no significant difference between the varied diet versus the monotonous diet, but thet there was a significant improvement during the last two weeks when compared with the first two weeks of the monotonous diet, as well as with the varied regime. There was a significant difference between the varied versus the monotonous diet for Bill in favor of the varied, which might indicate that he tired of the monotonous regime. This was not born out by the average length of time spent at the table since for the varied diet it was 18 minutes against 16 minutes on the monotonous diet. Further evidence for the fact that he did not tire of the monotonous diet was indicated by the significant difference between the first fourteen and the last fourteen days of the monotonous period, (6±1.26) in favor of the last two weeks. Had he tired of the diet it is not likely that he would have shown improvement in application ot the business of eating.

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Stimulation During Meal Times.

The number and type of stimulations were studied in relation to the experimental procedures, namely, stimulation for the entire study, and for the varied versus the monotonous period. The stimulations were classified as to whether they pertained to the subject's eating or general behavior. The findings showed that the average number of stimulations on the varied diet for both boys were approximately the same being 1.44 for Bill and 1.33 for Don, and that the distribution of the stimulations in terms of those related to eating and those related to behavior was approximately equal. During the monotonous period the average number of stimuli for each child related to eating remained approximately the same as during the varied diet. However, the average number of stimuli per meal, related to behavior for Don decreased and for Bill remained practically the same.

Correlations Between Factors Related to Time, Percentage Concentration and Stimulations.

The relationship between such factors as total time versus concentration and distraction times as well as percentage concentration against number of stimulations was determined by means of linear correlations. It was found that when total time increased it was due to the fact that the children spent not only more time at the business of eating but in playing as well. Since the correlation coefficients

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on total time against concentration time for Bill and Don were  $\pm$ .917 and  $\pm$ .915 respectively as against  $\pm$ .762 for total time against distraction time. However, the coefficients indicated that there was a slightly greater tendency on the part of the subjects to increase the meal time, because of concentration time than because of distraction time. There was a slight tendency for percentage concentration and number of stimulations to increase simultaneously, since the coefficient for Bill was  $\pm$ .376 and for Don  $\pm$ .471. However, this relationship bears further investigation since there was no attempt to control either the number or type of stimulations.

### Conclusions:

1. If the length of time spent at the table be used as a measure of the childrens interest in their food, it would not appear that the children tired of the monotonous diet.

2. The significant differences for various intervals during the study for both subjects showed that their percentage concentration increased during the last two weeks of the experiment which provides further evidence for the fact that they did not time of the monotonous menu.

3. By a statistical calculation on percentage concentration for the two subjects it was found that there was a significant difference in favor of Don, that is, Don's application to the business of eating was significantly better

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than Bills.

4. When total time at meals was increased, the subjects tended to increase not only their time at the business of eating but in playing as well, a fair positive correlation between percentage concentration and number of stimulations was demonstrated.

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# TABLE XXV

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_	Breakf	ast	Lun	oh	Sup	per
Day	В	C	В	C	В	С
4	93.3	95.5	96.7	96.7	94.7	94.7
6	95.0	95.0	89.5	92.7	96.7	97.8
8	80 <b>.2</b>	77.7	89.6	88.5	91.4	90.3
10	88.2	87.0	88 <b>.9</b>	83.0	80.2	78.3
12	84.8	88.6	86.2	85.1	82.9	83.8
14	67.6	66.7	78.1	77.6	<b>7</b> 5 <b>.4</b>	74.6
16			74.7	74.7		
18	76.6	<b>7</b> 2 <b>.3</b>	66.9	67.9	68.1	70.9
20	66.7	65.6	83.0	82.0	79.3	78.4
2 <b>2</b>	79 <b>.9</b>	79 <b>.7</b>	82.0	82.0	87.4	88.4
24	85.1	88.0	80 <b>.9</b>	81.8	81.1	81.1
26	85 <b>.5</b>	85.5	70.5	69.6	84.9	84.9
28	75.3	79.0	83 <b>.3</b>	83.3	83 <b>.5</b>	83.5
30	87.1	88.6	82 <b>.7</b>	81.3	84.2	84.2
32	90.5	92.0	91 <b>.7</b>	93.0	82.0	83.0
34	91.7	91.7	80.2	80.2	84.2	83.2
36	79.8	79.8	87 <b>.8</b>	87.8	79.8	78.8
38	95.5	95.5	82.2	80.8	70.1	72.7
40	88 <b>.9</b>	86.1	81.8	81.8	91 <b>.4</b>	88.2
42	87.5	82.1	73.0	71.8	84.8	81.5
<b>≜</b> vg.	84.2	83.6	82.5	82.1	83.3	83.1

# PERCENTAGE OF CONCENTRATION FOR BILL WHEN OBSERVED BY B AND C

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## TABLE XXVI

PERCENTAGE	OF	CONCENTRATION	FOR	DON	HEN	OBSERVED	ΒY
		A AND	С				

_	Breakfa	st	Lunch		Supper	
Day	A	С	A	С	A	с
3	<b>98.4</b>	100.0	73.3	72.6	100.0	98 <b>.9</b>
5	90.4	90 <b>.4</b>	95 <b>.7</b>	<b>9</b> 8.6	91.0	96.0
7	98.6	100.0	83.2	80.0	84.4	84.4
9	95.2	93 <b>.6</b>	89 <b>.9</b>	90.9	96.5	92.8
11	93.2	91.9	93 <b>.7</b>	92.9	94 <b>.4</b>	89.7
13	94.2	92.8	83 <b>.8</b>	85 <b>.7</b>	84.0	84.0
15	84.0	85.0	77.8	74.4	72.3	74.4
17	89.3	82.6	95 <b>.9</b>	94.9	72.8	74.7
19	81.7	92.7	95.8	95.8	84.3	88.8
21	86.5	87.5	86 <b>.9</b>	88 <b>.</b> 9	86.3	88.6
23	73.2	73.2	79.3	78.5	80.7	81.3
25	88.9	72.5	87 <b>.7</b>	<b>8</b> 8 <b>.7</b>	87.5	87.5
27	86 <b>.9</b>	85.2	81.7	78.9	92.5	90 <b>.7</b>
29	85.5	85.5	83.8	82.5	100.0	97.9
31	100.0	100.0	100.0	100.0	100.0	100.0
3 <b>3</b>	92.9	92.9	100.0	100.0	96 <b>.0</b>	96 <b>10</b>
35	93 <b>.</b> 0	93.0	100.0	94.9	92.3	93.8
37	100.0	97.3	97 <b>.7</b>	93.2	98.0	98 <b>.0</b>
39	100.0	97.6	100.0	96.1	82.3	83.9
43	98 <b>.0</b>	89.5	98.0	98 <b>.0</b>	98.0	88 <b>.6</b>
<b>Avg.</b>	91.2	91 <b>.1</b>	90.3	89.3	89.1	89 <b>.5</b>

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### TABLE XXVII

### Breakfast Lunch Supper do Concentration Concentration Concentrati Ð Φ θA Percentage Percentage Percentage Subjective Rating Subjective Rating Subjectiv Rating Stimuli Stimuli Stimuli Profile Reting 00 Prof'11e Profile Rating Rating Number Number Number Day 93.3 96.7 94.7 0 E E 8 E G 13 E G 4 5 94.0 9 E G 93.0 14 Ε F 97.0 6 E G E 92.7 11 5 E 3 E G 97.8 G 6 95.0 E 7 93.3 E 92.5 E 93.2 9 E G 2 E E 4 9 89.9 Ε 91.3 6 E G 8 80.2 G G 8 G 93.2 9 93.7 89.3 5 Ε 6 E G 3 E E G 88.9 19 80.1 10 88.1 E 6 G G 5 E G P 87.6 35 11 90.2 E G 91.9 8 E G E E 6 12 G 84.8 86.1 E G 4 G G 4 E 82.9 13 83.3 90.4 89.0 6 E G 5 E 6 G G G 14 78.1 75.4 8 G 67.6 G 8 G G G 8 G 80.9 9 70.8 13 G G G G 73.0 12 G G \*2 16 74.7 78.2 3 G G 11 G G 17 80.6 12 69.9 F G G 74.6 5 G G 14 G 68.1 18 9 10 G 76.6 6 G G 66.9 G G G 81.1 7 19 87.0 G G 75.4 6 G G 4 E E 79.3 20 66.7 G \*1 6 G G 8 G 89.0 3 E E 21 80.4 F 13 G 78.9 15 F G 7 G 87.4 82.0 E 22 79.7 G G G G 4 6 G G 78.4 80.0 10 23 76.0 10 G G 8 G G 80.9 7 G 24 88.0 E E 6 G G 81.0 G 4 80.9 85.3 9 G 25 73.0 G G 6 G G G 12 G 84.9 5 26 E 70.5 G G 85.5 E 10 G 4 79.8 79.6 G 5 G F G 27 64.9 12 F 3 G 83.3 75.3 G G G 83.6 12 G G 28 9 6 G GGEG 29 75.0 G G 81.9 8 G G 84.9 7 G 4 84.3 G 82.7 7 4 30 87.1 5 Ε G G G 31 1 85.3 4 E 91.1 E E 95.7 E Ε 2 91.7 ī 26 2 E E 83.0 G 32 90.4 E E 82.0 G 10 G 33 84.6 7 G G G G \*1 finished.

### COMPARISON OF PROFILE RATING WITH NUMBER OF STIMULI AND SUBJECTIVE RATING OF BILL'S MEALS

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## TABLE XXVII continued

## COMPARISON OF PROFILE RATING WITH NUMBER OF STIMULI AND SUBJECTIVE RATING OF BILL'S MEALS

	Brea	kfas	t		Lunc	ħ			St	ipper	•	
Day	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Fercentage Concentration	Number Stimuli	Profile Rating	Subjective Rating
34 35 36 37 38 39 40 41 42 43	91.7 93.2 79.8 86.0 95.6 95.2 88.9 89.4 87.5 86.7	ରେ ଓ ଓ ଓ ୭ ୭ ୦ ୦ ଗା ପା	NHCHMMMHMH	000000000000000	80.1 77.2 87.9 84.8 82.2 73.8 81.8 86.7 71.8 90.2	4632241573	00000000000000000000000000000000000000	10000000000000000000000000000000000000	84.2 81.0 79.8 89.2 70.1 80.2 91.3 62.0 84.8 89.1	1936313453	COCECCE	CCCCCCEFCE
Avg.	83.9	5.6			83.5	6.5			83.6	6.1		



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# TABLE XXVIII

-61-

## COMPARISON OF PROFILE RATING WITH NUMBER OF STIMULI AND SUBJECTIVE RATING OF DON'S MEALS

	B	reak	fas	t	L	Lunch				Supper			
Day	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Per centage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Per centage Concentration	Number Stimuli	Profile Reting	Sub je ctive Rating	
4567890112345678901123456789012222456789012333556	97.2 90.4 100.0 98.6 93.0 95.1 93.3 93.2 100.0 94.2 87.0 84.0 91.8 89.3 92.0 84.0 91.8 89.3 92.0 81.7 86.5 93.2 93.0 93.0 81.8	0 6 5 0 4 6 4 5 5 7 4 6 4 6 5 5 8 6 5 5 8 4 5 4 8 4 8 0 0 8 8 8 8 8 5 5 8 4 5 4 8 4 8 0 0 8 8 8 8 8 8 8 8 8 8 8 8 8 8	M M M M M M M M M M M M M M M M M M M	E 0 E E E E E E E E E E E E E E E E E E	92.3 95.6 83.9 83.2 65.8 89.8 81.0 93.7 83.8 81.9 77.8 95.9 83.8 95.9 85.6 79.3 86.5 87.7 81.7 81.7 81.8 83.8 92.0 100.0 100.0 100.0	$\begin{array}{c} 6\\12\\13\\7\\6\\11\\13\\10\\7\\11\\15\\6\\11\\7\\2\\7\\5\\7\\7\\2\\8\\7\\4\\4\\0\\1\\0\\0\\0\end{array}$	<pre>PHOCONCECHCHCHCHHHCCHCHCHHHHHHHHHHHHHHHHH</pre>	00004044044044040400000444444444	90.8 91.0 97.0 84.4 90.7 96.5 95.9 94.4 93.5 84.0 82.5 72.3 88.9 72.3 88.9 72.3 88.9 72.4 84.3 93.3 86.3 100.0 80.7 90.3 87.5 86.7 92.5 100.0 100.0 98.0 100.0 95.0 95.0 95.0 96.5	648624567445067416489985000002440	нынонныныооноосыныоныныныныныны	0 H 0 0 H 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

# TABLE XXVIII continued

## COMPARISON OF PROFILE RATING WITH NUMBER OF STIMULI AND SUBJECTIVE RATING OF DON'S MEALS

220	Brea	akfas	st		Lung	h			St	ipper		
Day	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating	Percentage Concentration	Number Stimuli	Profile Rating	Subjective Rating
37 38 39 40 41 42 43	100.0 97.7 100.0 100.0 100.0 93.8 93.0	1 0 0 0 0 2 1	EEEEEE	网络西西西西	97.7 96.8 100.0 85.4 92.5 90.1 98.0	0 10 4 3 4 0	EEEEEE	HHHHHH	98.0 98.3 92.3 90.5 93.3 92.0 87.1	0 0 4 4 2 0 5	HHCHHHH	SEGRED S
Avg.	89.8	2.8		-	89.1	5.7			90.1	5.0		E

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# TABLE XXIX

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# CONCENTRATION TIME AT MEALS IN MINUTES

	Breakfast		Lunch		Supper	
Day	Bill	Don	Bill	Don	Bill	Don
12345678901234567890122222222233333333344444 12345678901234567890122345678901234567890123	24 18 13 14 15 10 9 11 12 14 15 10 10 10 10 10 10 10 10 10 10	19 13 10 12 11 10 11 10 11 11 9 10 14 14 11 12 11 10 11 11 9 10 14 14 11 12 11 10 11 11 9 10 14 14 11 12 11 10 11 11 9 10 14 14 11 12 11 10 11 11 10 11 11 10 11 11 10 11 11	15 20 14 15 20 19 12 14 18 28 19 14 19 17 18 19 20 13 15 14 18 19 20 13 15 14 18 15 15 13 14 13 10 10 11 11 14 19 20 13	16 23 16 16 23 23 13 14 15 26 20 13 22 21 15 20 16 15 11 11 17 16 18 14 16 17 15 12 11 10 12 9 10 11 10 8 7 8 9 7 8 11 8	13     18     16     12     17     15     17     14     12     14     19     15     18     16     21     34     20     14     15     12     14     15     12     14     15     12     14     15     12     14     15     12     14     15     14     14     14     9     11     14     9     13     11     14     9     13     11     14     15     14     14     14     14     19     13     11     14     1	$   \begin{array}{c}     15 \\     13 \\     15 \\     16 \\     15 \\     16 \\     15 \\     16 \\     9 \\     15 \\     17 \\     17 \\     16 \\     20 \\     17 \\     13 \\     20 \\     14 \\     13 \\     11 \\     15 \\     13 \\     20 \\     14 \\     13 \\     11 \\     15 \\     13 \\     20 \\     14 \\     13 \\     11 \\     15 \\     13 \\     20 \\     14 \\     12 \\     10 \\     18 \\     10 \\     9 \\     10 \\     10 \\     10 \\     10   \end{array} $
<b>Avg</b> .	12	10	15	14	15	14

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#### TABLE XXX

	Breakfast				Lunch		Supper		
Dev	TO- tal	ESt- ing	Be- havior	TO- tel	Eat- ing	Ee- hevior	TO- tal	Eat- ing	Be- havior
4	0	0	0	7	3	4	13	3	10
5	8	2	6	14	7	7	6	2	4
6	2	0	2	11	4	7	4	2	2
7	2	0	ຂ	4	2	2	8	3	5
8	9	5	4	8	5	3	6	4	2
9	3	2	l	5	5	0	6	2	4
10	5	5	0	19	16	3	6	6	0
11	6	4	2	8	1	7	3	1	2
12	4	3	1	4	2	2	5	4	1
13	6	5	1	5	3	2	6	2	4
14	8	4	4	7	3	4	8	2	6
15	13	10	3	9	5	4	12	9	3
16	3	2	1	11	6	5			
17	6	3	3	12	8	4	14	13	1
18	6	3	3	9	8	l	10	8	2
19	6	6	0	4	4	0	7	5	2
20	8	7	l				6	6	0
21	13	11	2	13	7	6	3	3	0
22	14	4	0	6	3	3	8	5	3
23	8	5	3	8	2	6	10	6	4
24	4	3	1	9	6	3	7	5	2

TOTAL NUMBER OF STIMULATIONS FOR BILL CLASSIFIED ACCORD-ING TO WHETHER THEY PERTAINED TO HIS EATING OR GENERAL BEHAVIOR

### TABLE XXX continued

TOTAL NUMBER OF STIMULATIONS FOR BILL CLASSIFIED ACCORD-ING TO WHETHER THEY PERTAINED TO HIS EATING OR GENERAL BEHAVIOR

	Breakfast			I	Lunch		Supper		
Day	To- tal	Eat- ing	Be- havior	To- tal	Eat- ing	Be- havior	To- tal	Eat- ing	Be- havior
25	12	7	5	6	3	3	9	5	4
26	4	2	2	10	4	6	5	0	5
27	12	7	5	3	0	3	5	3	2
<b>2</b> 8	9	4	5	6	1	5	12	5	7
29	6	4	2	8	4	4	7	7	0
30	5	5	0	7	7	0	4	4	0
31	2	2	0	3	1	2	4	2	2
32	2	0	2	2	2	0	1	0	l
33	7	7	0	6	6	0	10	10	0
34	5	4	1	4	4	0	1	l	0
35	5	5	0	6	6	0	8	5	3
36	6	4	2	3	2	1	3	3	0
37	6	6	0	7	7	0	5	5	0
<b>3</b> 8	2	2	0	2	2	0	3	3	0
39	4	2	2	4	2	2	1	l	0
40	3	0	3	1	0	1	3	0	3
41	3	2	1	5	0	5	4	2	2
42	3	0	3	7	4	3	6	2	4
43	3	0	3	3	0	З	3	0	3
							1		

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# -66-TABLE XXXI

	Breakfast				Lunch			Supper		
Day	To- tal	Eat- ing	Be- havior	To- tal	Eat- ing	Be- havior	To- tal	Eat- ing	Be- havior	
4	0	0	0	6	3	3	6	2	4	
5	6	1	5	12	4	8	4	1	3	
6	3	0	3	14	3	11	8	3	5	
7	0	0	0	7	4	3	6	3	3	
8	4	2	2	6	3	3	2	2	0	
9	3	2	1	3	2	1	0	1	1	
10	4	0	4	11	8	3	5	2	3	
11	5	3	2	7	3	4	5	2	3	
12	4	2	2	7	1	6	З	2	1	
13	5	2	3	6	6	0	2	2	0	
14	4	3	l	7	3	4	З	3	0	
15	6	0	6	6	3	3	5	5	0	
16	4	3	1	15	10	5	10	6	4	
17	6	5	1	6	2	4	6	4	2	
18	3	2	l	11	11	0	7	6	1	
19	3	1	2	7	2	5	4	1	3	
20	2	0	2	2	1	l	1	1	0	
21	6	5	l	7	7	0	6	5	1	
22	5	0	5	5	2	3	4	0	4	
23	3	3	0	7	5	2	8	3	5	
24	2	0	2	7	5	2	6	6	0	

TOTAL NUMBER OF STRULATIONS FOR DON CLASSIFIED ACCORDING TO UMETHER THEY FERTAL ED TO FIS EATING OR GENERAL BEHAVIOR

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## TABLE XXXI continued

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TOTAL NUMBER OF STIMULATIONS FOR DON CLASSIFIED ACCORD-ING TO WHETHER THEY PERTAINED TO HIS EATING OR GENERAL BEHAVIOR

	Breakfast				Lung	h	Supper		
Day	To- tal	Eat- ing	B <b>e-</b> havior	To- tal	Eat- ing	Be- havior	To- tal	Eat- ing	Be- havior
25	4	4	0	5	2	3	6	6	0
26	3	0	3	8	4	4	8	6	2
27	4	2	ຊ	7	5	2	5	4	l
28	2	2	0	8	5	3	0	0	0
29	4	3	1	7	5	2	0	0	0
30	2	l	l	4	2	2	0	0	0
31	0	0	0	4	2	2	0	0	0
32	0	0	0	0	0	0	0	0	0
33	2	2	0	1	l	0	2	2	0
34	2	2	0	0	0	0	4	4	0
35	2	2	0	0	0	0	4	4	0
36	2	2	0	0	0	0	0	0	0
37	1	1	0	0	0	0	0	0	0
38	0	0	0	1	l	0	0	0	0
39	0	0	0	0	0	0	4	4	0
40	0	0	0	4	4	0	4	4	0
41	0	0	0	З	3	0	2	2	0
42	2	2	0	4	3	l	0	0	0
43	1	1	0	0	0	0	5	5	0

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