THE EFFECT OF TEXTURE ON THE PRESCHOOL CHILD'S WILLINGNESS TO EAT COOKED VEGETABLES

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Elizabeth B. Tracy

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School children - Food
Serves

7 Home

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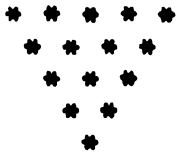

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THESIS

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CHAPTER I.

INTRODUCTION.

Purpose of the Study.

It is often more difficult to get children to eat cooked vegetables willingly than to eat fruit, cereals or other foods. It has long been the contention of the writer and of many who work with children that some of this unwillingness is due to the texture of the cooked food. Therefore, this study was undertaken to ascertain, if possible, whether children actually do prefer certain textures in their foods, which they accept most readily, and some of the reasons for their preferences.

It was also thought desirable to study, at the same time, the effect of the social group on the child's concentration at mealtime. If one social grouping stimulates a child to accelerate his eating or another group interests him in such a way that he lingers longer at his meal, the knowledge of this influence and the use of such knowledge might enable us to help the child regulate his eating habits so that more favorable results could be obtained.

There are many factors besides texture and social influence which affect the child's speed of eating, but only these two factors were chosen for this study. That these

factors are not common to this small group of children alone but to children in general is well brought out in the literature on the subject.

REVIEW OF THE LITERATURE.

There are numerous reasons for a child's refusal of food. The literature groups these reasons under two main headings: physiological and psychological. Under physiological are given such causes as improper feeding, fatigue, hygienic factors, physical defects, and peculiarities of motility or secretion. These will be taken up first, followed by a discussion of the psychological reasons, which include conditions of bad training, poor management, and emotional factors. The value of hunger and appetite will be discussed, as well as the findings in the literature relative to the prevalence and significance of lack of appetite.

Physiological Reasons for Failure to Eat.

Of all the physiological reasons that are given, it is the concensus of opinion of authors that the most important is improper feeding. This involves too frequent feedings, the giving of unsuitable foods, excessive milk drinking, or diets poorly proportioned in one or more of the food elements, especially diets too high in fat or too low in vitamin B content. In feeding a child, a proper balance must be

maintained, not only in the food elements themselves, but in the time interval in which they are administered. If a child is fed too frequently, he naturally will not be hungry at each mealtime. The stomach needs a certain amount of time after digestion is completed in which to produce a feeling of emptiness or hunger for the next meal. Griffith (16) says: "Loss of appetite is often a prayer on the part of the stomach to be given a period of rest." Sauer (40), von Hofe (47), and Clarke (10), in studying anorexia in early childhood, all advise against the practice of giving milk between meals because it lessens the appetite for the next meal. Not only should the meals be properly spaced, but they should be served regularly on an unvarying schedule, in accordance with the best ideas of child management.

There are many foods that are unsuitable for children because they impair the appetite for those foods which are considered necessary body builders. Highly seasoned, rich, or strongly flavored foods should be eliminated, according to Kerley (23,24), in favor of plain, simple, easily digested foods, which are the only appetite stimuli a child needs.

This idea is strengthened by the work of Davis (12) with newly weaned infants. She allowed her subjects to select their own foods from a large variety of natural un-mixed and un-seasoned foodstuffs. Nothing was said or done in any way to influence a child to take a food or to leave it alone.

The infants responded in a normal fashion, attacked their food eagerly, ate enormously large amounts in a business-like manner, and stopped with an air of finality when they were through. Artificial flavorings were not necessary when the psychological setting was ideal; hunger was the only factor prompting the child to eat.

Kerley (21,23), Sauer (40), and von Hofe (47) give excessive milk drinking or milk taken at the beginning of the meal as a cause for refusal of other foods by many children. The refusal might be based on the satiety value of the milk itself, or on the high fat content. Too high a percentage of milk fat, cream or butter is given by Kerley (23) as a reduction factor in the child's appetite for other foods. For most efficient results, the fat and carbohydrate content of the diet must be proportioned in such a way that these elements burn together and the fat digestion is not stopped at an incomplete stage due to exhaustion of the supply of carbohydrate. Studies by Miller and Rehfuss (27) show that sugars and candies have a definite effect on digestion. Soft, rich candies and sweets have a depressing effect on the appetite for other foods. Sucking on stick candy was shown to have little effect on gastric secretion, since it introduces very little sugar into the stomach. Chocolate, on the other hand, stimulates gastric secretion. Von Hofe (47), Kerley (23,24), and Roberts (37) also cite too many sweets as a cause of poor appetite.

Vitamin B is now recognized for its beneficial effect on appetite. Osborne and Mendel (33), working with rats, demonstrate an increasing need of vitamin B with growth. On a constant composition diet, when quantitative adjustment of small items such as vitamin B is not made, gain in weight ceases; when vitamin B is added, weight again increases. Ross and Summerfeldt (39) find that the addition of B to the diets of orphanage children increases their weight 1.6 times the expected gain in a six-month period. Daniels and Byfield (11), Chaney (9), Newell and Miller (31), in studying the diets of underweight children, show that orange juice as a supplementary food promotes gain in weight, due possibly to its high vitamin B content.

Children may refuse foods because they are timid about trying new textures. Von Hofe (47), Baker (1), and Neff (30) found that children kept too long on a milk diet have difficulty in becoming accustomed to solid foods, and give evidence of lack of appetite because they cannot or will not masticate solid food. In such instances the child may be forced to take food into his mouth, but he cannot always be induced to swallow. He may regurgitate any he has swallowed, spit the food out, or simply store it in his cheek, squirrel fashion. It has frequently been observed that a child will separate the food he dislikes from a mixture in his mouth and store this in his cheek, swallowing the rest. A child sometimes

goes home from nursery school at suppertime still carrying in this way part of the lunch that has been stored all during the nap.

Poor health habits may have just as undesirable effects on appetite as improper habits of feeding. The child who is fatigued from over-activity or insufficient rest will have very little desire for food, according to Ramsay (35). Roberts (37) has this to say:

> "Activity is a normal attribute of childhood, and is essential to the child's development. Exercise of the right kind and in proper amounts stimulates the appetite, promotes sound sleep and good digestion, improves the size and tone of the muscles, and is in general conducive to good health and nutrition. But, carried to excess, it becomes a harmful rather than a beneficial factor. There are two chief ways in which this unfavorable effect may be produced. All exercise is performed at the expense of the energy of foods. If the caloric intake equals the outgo in energy, the balance is maintained; but if the expenditure through activity is not replaced by food, the body tissues are oxidized to make up the deficit with a resulting loss of weight. When children are excessively active it is difficult for them to eat enough to keep up with the outgo and to provide for growth, unless a high caloric diet of small bulk is provided. So long as the intake does compensate for the outgo, however, exercise cannot be judged harmful by this one criterion alone.
>
> But the factor of fatigue must also be considered. Physiologists have shown that when a muscle is exercised too long or too

> hard without intervals of rest, there is an accumulation of fatigue toxins in the blood, which may circulate to all parts of the body, there to have a depressing effect on nerves, glands, muscles, and the various bodily functions. Unless such fatigue is followed by an adequate period of recuperation, the effects become cumulative and a condition of chronic fatigue follows. Loss of appetite, inability to sleep, and a hyper-irritable nervous system are the usual accompaniments in children, and from these malnutrition results."

On the other hand, a child may become fatigued because he is not eating enough food to furnish the energy needed for bodily activities. Thom (44), Roberts (37), and Kerley (23,24) support this statement. Every activity in which the child indulges, every movement he makes, requires energy which can come from but two sources -- the food eaten or the body itself. If the child is so tired that he lacks interest in his food, he may need to be put to bed for a period of rest and relaxation before food is given him. His small appetite at this time is probably a provision of nature to prevent overtaxing an already tired digestive system.

Insufficient fresh air and out-of-doors activity have a deleterious effect on appetite. Roberts (37), quoted below, expresses the belief that

> "sunshine, fresh air, and wholesome, happy play, no less than food and sleep, are absolute necessities for sound development, and a child who is deprived of his full requirement of them cannot be expected to be normal any more than can a house plant grown in the dark. It is not easy to explain just

> how indoor housing of children acts to undermine their nutrition and general health. It has been scientifically shown that bad indoor air does not produce its depressing effects, as was once thought, either by its excess of carbon dioxide or by its lack of oxygen. The lack of physical well-being which results from bad indoor air is due to its being too warm, too dry or too still, or to a combination of all three causes. Whatever the mechanism by which these factors produce their results, the effects are obvious even to the most unobservant. Lack of appetite, finickiness, pallor , and pther physical signs of poor nutrition are characteristic of the housed child."

According to Hobhouse (17) and Baker (1), constipation, with a slowing down of the movement of food through the stomach and intestines, produces a sluggish feeling which has an undesirable effect on appetite. This might well be caused by an irregular schedule, which in itself is a reason for some children's lack of interest in food. The body acts best when it has definitely established hours for eating, sleeping and evacuation.

It is generally agreed by Emerson(14), Kerley(22,23,24), Clarke(10), Baker (1), and Roberts (37) that nasopharyngeal defects, especially abnormal tonsils or adenoids, are common causes of lack of appetite in children. The effects of these may be manifested in two ways: the diseased organs may become enlarged and act as mechanical hindrances to the passage of food and air, making it difficult or impossible for the child to swallow. The toxic products from the diseased organs may

circulate throughout the entire body, resulting in a diminished bodily resistance, lack of appetite, and generally lowered state of health and nutrition. Removal of such physical defects usually leads to an improved physical condition in general. It is a well recognized fact that children's appetites improve after removal of abnormal tonsils or adenoids, or both. However, one hundred percent improvement should not be expected on the basis of the removal of only one factor. Usually many psychological factors have been employed by the parents in their desire to induce the child to eat in spite of the physical handicap, and the former must be removed before the child comes to accept his food on the basis of normal hunger and appetite alone.

The literature lists other physical defects such as bad teeth, heart disease, tuberculosis, infective diseases, and hookworm, all of which have adverse effects on general health and appetite. Kerley (22,23) attributes some few cases of poor appetite to lowered gastric acidity. His study of the rate and amount of secretion of gastric juice in 125 children with normal and poor appetites shows the poor appetite group to have only 75% as much total acid and 50% as much free HCL acid as the normal appetite group. The records of these cases show no other physical reasons for failure to respond to treatment. Usually any program directed toward dietary and hygienic improvement has favorable effects upon appetite.

Many of the reasons why a child may fail to have a good appetite, and be hungry at mealtime have been discussed at some length, but little has been said about what is meant by "hunger" or "appetite." Common usage gives the two terms the same meaning as to quality, with a difference only in intensity: mild hunger is usually called "appetite", and strong appetite, "hunger". Authors, however, differentiate on the basis of quality. They define hunger as primarily an unpleasant and painful sensation -- a feeling of tension, pressure, or pain in the stomach, caused by muscular contractions, more or less intermittent. Appetite, they say, is essentially pleasant in character and without definite periodicity. Hunger is referred to the stomach, while the appetite complex is referred to the mouth and throat.

Appetite is caused, according to Carlson (7), either by the immediate taste and smell of palatable food or is induced by memory processes of such taste and smell sensations. The feeling of hunger is caused by definite muscular contractions. Appetite is probably the factor of greater importance with adults who are not active enough to digest one meal in time to create a feeling of hunger for the next. Children, according to Kerley (22), experience greater hunger than adults, due to increased activity and greater secretion of gastric juice which shortens the period of digestion and hastens the emptying of the stomach.

A normal flow of gastric juice is essential for the digestion of food. For years, Pavlov's view was generally accepted, namely, that appetite is the best stimulus to the abundant secretion of gastric juice. However, Carlson (8) demonstrates that there is a continuous secretion of gastric juice, and that in a hungry person, sight, smell, and thought of food has little influence on this continuous secretion. Even chewing on substances not related to food does not cause secretion of gastric juice. The all-important factor for appetite secretion is the tasting or chewing of palatable food. The chief biological significance of hunger and appetite for digestion lies in the fact that these symptons are an indication that the gastro-intestinal tract is in a proper motor and secretory condition to handle ingested food.

Carlson (7), gives an interesting summary of established points of interest on appetite:

1. seeing, smelling, tasting of food induces gastric secretion provided a state of hunger and appetite exists; therefore, it is a conditioned reflex.

2. mere chewing of substances other than food does not cause the secretion of gastric juice.

3. the rate of secretion varies directly with the palatability of the food and the degree of hunger and appetite.

4. the quality of the appetite gastric juice depends on the rate of secretion and is independent of the nature of the food.

5. the appetite secretion can be removed

without interfering with digestion, so it may not be necessary, but is at least a factor for safety.

That problems of nutrition and especially anorexia, or lack of appetite, abound in the preschool years, is evidenced by the numerous articles on the subject in both medical and polular literature. This condition is a familiar symptom among children brought to physicians, who consider it most serious. To quote from one author, Kerley (21): "In the growing child ample feeding is absolutely necessary. When there is habitual lack of appetite the entire life may be unfavorably influenced and the condition is abnormal."

Candidates for advanced degrees at the University of Chicago carried out a series of studies on the prevalence and significance of non-hunger among preschool children. Barker (3) studied twelve children for three months and found only one child normally hungry for his meals. Maclay (26) studied the eating habits of one hundred children by the questionnaire method, and found only sixty percent with good appetites -- forty percent were definitely non-hungry. Moseley (29), studying one hundred children in city homes, found sixty-six percent non-hungry; and Johnston (20), studying fifty children in country homes, found twenty-six percent non-hungry and twelve percent indifferent.

These studies indicate that lack of appetite is more prevalent among city children of the well-to-do class, where

the children are petted, over-indulged, and over-cared-for; among only children who are receiving all of the mother's and perhaps the grandmother's attention; and among spoiled "only boys" or "only girls" in a family of several children of the opposite sex. These are all emotional factors and it seems well to review the literature on the psychological reasons for a child's refusal of food or lack of appetite.

Psychological Reasons For Failure To Eat.

The underlying psychological cause of most bad food habits is bad training, which may take the form of example, attitude, or attention. Children tend to imitate their elders and often will refuse a food because they have seen a favorite parent refuse that same food. Porter (34) and Neff (30) cite poor example as a psychological cause of poor appetite; Baker (1) and Schmidt (41,42) give good example as a means of encouraging a child's appetite.

Low expectation frequently leads a child to refuse food. Cameron (4) writes that children sense what is expected of them, and an attitude of doubt or uncertainty on the part of the parents is felt by the child and is reflected in the quantity of food he takes.

Oversolicitude, involving too-constant attention or too much control, devebps negativism in a child, in the opinion of Cameron (4,5), Schmidt (42), Neff (30, and Huenekens (19). If he is allowed to be the star actor in a mealtime drama, he

will continue to refuse food in order to keep attention centered upon himself. Feeding him after he is old enough to feed himself, and talking about his eating habits in his presence are cited as bad psychological techniques. One author, Thom (44), gives neglect due to mother's absence as an emotional reason for a child's failure to eat.

Hand in hand with bad training goes poor management of the mealtime procedure. Rand,Sweeney and Vincent (36) advise that authority be vested in one or two persons who agree in policy, so that a unified and consistent plan be followed. Some of the authors think there is a high percentage of refusals of food among children who are governed by more than two adults, i.e., by parents and grandparents.

Regarding the carrying out of disciplinary measures, Huenekens (19), Cameron (4), and Thom (44) agree that excessive authority from the governing body is as bad as authority from several sources. It develops a spirit of rebellion in the child. They also affirm that weak authority is probably worse than no authority at all, for it promotes in the child a feeling of its own power over adults and teaches him that orders are to be obeyed only when convenient. An attitude of firmness must be adopted and carried out on all occasions.

More often than parents realize, a child's appetite is dulled by emotional factors. Unhappiness and worry on the part of a child, nagging by the parents, are listed in the

literature by Cameron (5) and Neff (30). Threats and punishments, state Cameron (5), Baker (1), and Thom (44), upset a child and cause him to lose interest in his food or take an undesirable attitude toward his meals.

Just as pleasant associations stimulate the child to eat, so unpleasant ones may condition him against food, according to Schmidt (42). Scenes at mealtime, Cameron (4,5) says, or conversations about subjects which the child dislikes or fears are examples of unpleasant associations having harmful effects on appetite.

Thus it may be concluded from a review of the literature that a child may refuse food for certain well-founded physiological or psychological reasons. The physiological reasons include improper feeding, fatigue, hygienic factors, physical defects and peculiarities of motility or secretion. The psychological causes include conditions of bad training, poor management and unpleasant emotional conditions.

The following study concentrates on the child's attitude toward one particular article of diet, namely, vegetables. It is the aim of nutritionists to have all children learn to like a variety of vegetables and eat them willingly, since this food group has a prominent place in the ideal diet for growth and development, due to its high mineral and vitamin content. With this in mind, an attempt was made to determine the effect of texture on the preschool child's willingness to eat cooked vegetables.

CHAPTER II.

METHOD OF STUDYING THE EATING HABITS OF CHILDREN.

Review of Literature.

Several studies have been done on the eating habits of preschool children. These will be reviewed for method and for findings. Tupper (46) made a study of children four to five years of age in order to investigate the value of a definite type of training designed to improve concentration at meals as well as food intake of preschool children. To measure her subjects' concentration during the lunch period, she used a modification of the profile method, which showed when the children were in or out of attention. Because she was testing the value of a definite training system, the trainer held conferences every day before lunch, to discuss with the children their past performances and enlist their participation in setting a new standard for the next meal.

Ball (2) used a variation of Tupper's profile method to compare the concentration at meals and the food intake of a small group of children under home versus nursery school conditions. She concluded that both concentration and food intake were improved by controlled eating conditions such as were to be found in the nursery school situation. There appeared, from her finding, to be little difference in the concentration of children during meals, whether seated in groups or at separate tables, though when seated separately less prodding and urging was necessary to keep their attention

centered on the business of eating.

Lewis (25) studied the daily variation in food consumption and eating habits of three preschool children, who lived at the University of Chicago Nursery School, for fourteen consecutive days. She studied the total calories consumed by the individual children in relation to the total time at meals, and the variations in the behavior of the children from meal to meal in a given day, and from day to day throughout the period. According to the findings, a child with a concentration of 85% or above was considered an "excellent" eater; a "good" eater ranged from 65% to 85%; a "fair" eater would be one between 50% and 65%, and anything below 50% was considered "poor." Lewis found that her subjects spent, on the average, 75% of the total mealtime at the business of eating. She found no definite correlation between the amount of food eaten and either the duration of the meal or the percentage concentration.

Nordholm (31) studied the effects of a monotonous diet over a period of six weeks on the eating habits of two preschool children. With one exception, her records show the children's concentration at meals to be within the range of 65 to 100% -- in other words, practically all their eating could be classified as "excellent" or "good." Nordholm defined "percentage concentration" as that portion of the time the child spent in actual eating, plus serving of the food.

Van Alstyne (47) reported an interesting study on the play behavior and choice of play materials of preschool children. The technique used by this writer is the basis for the method used in the present study. Van Alstyne's records were in the form of profile sheets on which straight lines recorded the child's attention to various play materials, while blank spaces indicated that he was "out of attention." To quote from this study:

> "The observer had a large watch with easily observed minute markings. She observed the minute at which a child started to play with a material, noted the symbol for that point, went down the list of children whom she was observing, doing the same thing for all, and returned to the top of the column by the time the minute was up, drawing the line under the symbol to the extent of one minute if the child was still playing with the material; then she again observed him, starting a new symbol if he had changed his occupation during that time. By constantly going down the list every minute, an observer was able to record the child's choice of play materials within the limits of accuracy of one minute. This degree of accuracy has been the limit which other workers in this field have also considered sufficient -- Cushing, Bott, and Herring and Koch. This method therefore allowed a distraction of the child's attention from the play material for 1 minute without showing a break in the line of the record. This minute for distraction was intentionally discounted when it was observed."

Plan of Present Study.

This study of the effect of texture on the preschool child's willigness to eat cooked vegetables was carried out

under the controlled conditions of the nursery school operated in connection with the Home Economics Division of Michigan State College. Daily records were kept for a period of ten consecutive nursery school weeks, with the exception of two enforced interruptions.

Sixteen children, nine boys and seven girls, were enrolled in the nursery school. It was decided to use all the children as subjects and to discard the data for those who were not in attendance regularly enough to contribute records of value. All the children were between two and five years of age at the beginning of the study. Gerry, the youngest, was two years and two months, while Susan, the oldest, was four years and eleven months. The following table gives the age and sex distribution of the children:

BOYS		GIRLS	
Gerry	2 years, 2 months.	Angela	2 years, 8 months.
Kenney	2 " 8 "	Dale	3 " 3 "
Charles	2 " 11 "	Sister	3 " 8 "
Jimmy	3 " 1 "	Marilyn	4 " 1 "
Peter	3 " 4 "	Anne	4 " 5 "
Harry	3 " 11 "	Jo Ann	4 " 5 "
Tom	3 " 11 "	Susan	4 " 11 "
Bingy	4 " 2 "		
John	4 " 5 "		

Six vegetables were selected for this study; beets, carrots, peas, lima beans, turnips, and rutabaga. There were several reasons for this selection -- the study was carried on during the months of February, March, and April, when the supply of fresh vegetables on the market was limited; most children under ordinary home conditions are familiar with the first three

vegetables named, and many children are not so familiar with the last three, thus an opportunity was afforded to compare the children's reactions to familiar and strange flavors. The beets, peas and lima beans were canned brands of the best quality. Previous to this experiment, lima beans had been used only three times during the year, and then only in the form of an escalloped dish with tomatoes, so that the flavor of lima beans alone was practically new to the children. Turnips and rutabaga had not been served to the children previous to the beginning of this experiment.

It was decided, wherever possible, to use four textures: mashed, pureed or riced, diced, and large pieces which the child would have to cut. The pureed and riced vegetables were so nearly of the same consistency that it was thought best to eliminate the bother and waste involved in sieving and use only riced vegetables.

In order to keep the flavor of each vegetable uniform for each texture, the vegetables were always cut in the same sized pieces and cooked in a constant amount of boiling water for the same length of time. The temperature of the water for cooking was kept at boiling throughout the cooking period of sixteen minutes. These factors were established in a trial period prior to the beginning of the actual experiment. The same amount of salt was always used. After the vegetable was cooked in this form, it was drained

and mashed, riced or diced, according to the texture being tested that day. When it was thus prepared in the desired fashion, butter was added for flavoring -- one level tablespoon was allowed for every six servings.

The vegetable being tested was always included in the menu when the day's lunch was being planned, but for the purposes of this study it was served alone at the beginning of the meal, on a small colored plate. It was the custom in this nursery school to eat everything on one's plate before the next part of the meal was served; so it was understood by the children when they became accustomed to this change in routine during a two-week practice period, that all the vegetalbe must be eaten before the dinner proper would be served. The vegetable was placed before each child simultaneously and a stop-watch started. The child could then finish at his own rate ofspeed, without direction or stimulation from those in charge. In the case ofthree of the younger children, some help had to be given with the mechanics of eating, but this was noted on the records.

In the preliminary trials, it was found that 45 and even 40 grams of the vegetable lessened the child's appetite for the rest of his meal. Thirty grams proved to be an acceptable portion for the purposes of this experiment. Every child was given the same amount, since this was an acceptable portion, similar in size to the servings the children were accustomed to eating.

Three factors were chosen as criteria for measuring the child's acceptance of the vegetable:

(1) the total length of time required to eat the vegetable.

(2) any verbal comments the children might make.

(3) the percentage concentration while eating.

The method of recording which was finally devised for this study of eating behavior was primarily that reported by Van Alstyne (47). A large, ruled sheet of paper, marked off in half-minute intervals as indicated in the following chart, was used. With one exception, the vegetable was either all eaten by the end of the ten-minute period or was not touched at all. In this one case, the total time was 11½ minutes; the percentage concentration was figured on the basis of the total time, since this was the method used in computing the other percentage figures.

DAILY RECORD SHEET.

Vegetable: Rutabaga.
Texture: Mashed.
Date: February 14, 1937.

Name	11:45		11:46		11:47		11:48		11:49 etc	ATTENTION TIME In	Out	Tot.
Kenney	x	x	x							1½	0	1½
Peter	o	o	o	o	x	x	o	x		1½	2½	4
Sister	x	o	o	o	x	x				1½	1½	3
Susan	o	o	o	o	o	o	x			½	3	3½
John	x	x								1	0	1
Dale	o	o	x	o	x	x	x			2	1½	3½

x - In Attention
o - Out of Attention
s - Vegetable Completed

The decision as to the child's state of attention was necessarily purely objective. If he was noticeably chewing food or in the act of carrying food to his mouth, he was considered "in attention." Swallowing could not be detected and was therefore not credited as part of eating. The check was recorded only for that fraction of the 30-second interval in which the child was observed. He might have been "in attention" during the remainder of an interval for which he was marked "out", or vice versa. In this manner, any error in the results is due to understatement rather than exaggeration. Twenty possible checks on each child for the alloted ten-minute picture would tend to give average results as accurate as those that Van Alstyne and other workers considered acceptable.

Due to the conditions under which the study was made, there was no check on the judgment of the observer as to whether the child was in or out of attention. Only one assistant was available. The best method of recording that could be devised under these circumstances was to have the assistant do the checking as the author named the half-minute intervals and the children who were out of attention during that interval. In this way one person's gaze could easily move around the room in one 30-second interval, while the recorder's gaze remained on the profile chart.

Since the number of children was small, the records for the ten-week period were not of the type that might permit of

statistical treatment. The findings are therefore offered tentatively, as indications of certain trends rather than as conclusive evidence of the effect of texture on the child's willingness to eat cooked vegetables.

From the studies reviewed in this chapter it would seem reasonable to expect a child to spend, on the average, from 65 to 75% of the total mealtime at the business of eating. The literature shows that a child's eating pattern may vary from meal to meal and from day to day. Each of the authors reviewed in the section uses some variation of the profile method of recording in studying the eating habits of children. In the present study concerned with the child's reactions toward cooked vegetables an objective decision as to eating behavior was made every thirty seconds for a duration of ten minutes, giving a possible twenty checks for the total period. The following chapter will be devoted to an analysis of these records and to a presentation of the findings of the study.

CHAPTER III.

THE FINDINGS OF THE PRESENT STUDY.

In analysing the findings from the present study of the effect of texture on the preschool child's willingness to eat cooked vegetables, the reactions of the group as a whole are given for each vegetable and each texture, as well as the percentage concentration of each child, based on his own total eating time. Graphs representing the daily fluctuations in each child's eating pattern are given, followed by an appraisal of the individual's eating habits. Since this study is purely objective, only the most apparent reasons for extremes in the pattern are given, such as the removal of abnormal tonsils and adenoids or chronic colds, which obviously might be responsible for a change in the eating pattern.

The findings are all given in the form of arithmetic averages for two reasons: these data are not of the type that permit of statistical treatment; the most reliable criterion for measuring the child's acceptance of the vegetable or texture was found to be a percentage factor* based on the length of time it took him to complete the vegetable compared with his actual eating time. No child ever had a second serving of the vegetable, and verbal comments were rarely made. Only three remarks were overheard throughout the experiment. During the preliminary period the same vegetable was used every day for a week, with variations only in texture. According to Nordholm's work on the effect of a monotonous diet on appetite, this repetition should have had

* Example: Time to complete vegetable - 6; actual eating time - 3; Percentage Concentration - 50%

no effect. Nevertheless, on the third consecutive day, when beets were served, John ate his portion very hurriedly with a disgusted look on his face, remarking, "Aw! we had beets again yesterday." On the fourth day that turnips were served, Susan sat in her locker taking off her snowsuit, apparently thinking of the lunch, for she remarked, "I just hope we don't have those yellow things for lunch again today." One other incident clearly showed the unreliability of children's remarks. Toward the end of the experiment Susan asked what vegetable was being served that day. Turnips were on the menu. "I like turnips," Susan said. "Will you eat all your turnips as soon as they are served to you?" "Oh, yes," Susan replied; "because I like turnips so much, and I think I'll be the first one finished today."

Susan's percentage concentration that day was 11.5 -- the second lowest figure on her daily chart! As a result of these remarks, it was decided that the best method by which to judge the child's willingness to eat the vegetable was by a comparison of the total time spent on that vegetable with the time actually spent in eating.it; in other words, his percentage concentration.

Findings for the Group as a Whole.

The differences in the average percentage concentration of the group for each texture are small, varying only 11.7%. This is contrary to one of the ideas underlying this study, namely, that children are more willing to eat textures which entail little chewing, that is, pureed or mashed, rather than diced or large pieces. On the other hand, many children object to soft foods.

The data recorded below give lowest concentration figures for the pureed vegetables (59.5%) and highest figures for the large pieces. (71.2%). The pureed and mashed textures are similar in consistency, as are the diced and large pieces. The average concentrations for these two groups of textures vary only .9% and .5% respectively; the difference of 11.3% between the two groups puts the figures in the "fair" and "good" groups on the four-point scale.

TABLE I.

AVERAGE PERCENTAGE CONCENTRATION OF THE GROUP FOR EACH TEXTURE.

Texture	Total Percentage Concentration	Number of cases	Average Conc. of Group For: Each Texture.	All Textures.
Pureed	6956.5	117	59.5	
Mashed	10320.2	168	61.4	
Diced	10398.3	147	70.7	
Large Pieces	5483.3	77	71.2	
Total:	33160.3	509		65.3

Vegetables in the order of the preferences of these children, based on the average concentrations for the group, are: beets, carrots, peas, lima beans, rutabaga, and turnips, as is indicated in Table II.

TABLE II.

AVERAGE PERCENTAGE CONCENTRATION OF THE GROUP FOR EACH VEGETABLE.

Vegetable	Total Percentage Concentration	Number of Cases	Average Conc. of Group For: Each Veg.	All Veg.
Beets	6765.6	93	72.7	
Carrots	7201.9	102	70.6	
Peas	4398.7	66	66.6	
Lima Beans	4550.2	74	61.5	
Rutabaga	4975.0	83	59.9	
Turnips	5266.9	91	57.9	
Total:	33158.3	509		65.1

The first three vegetables are more commonly used and have flavors with which most children are familiar. Lima beans, rutabaga and turnips have more pronounced flavors, with which these children were not so familiar. The flavors the child is accustomed to eating in vegetables seem, according to these findings, to be the ones which he accepts most readily. There is a concentration difference of 14.8% between beets and turnips. The range of 57.9% to 72.7% is considered between "good" and "fair" eating, according to Lewis' scale.

The Effect of Social Contacts on the Eating Concentration of Several Children.

The records of several children were analysed to determine the effect of social contacts on a child's eating concentration at mealtime. The children were seated in the same groups for repeated servings of a certain vegetable-texture combination. The examples given in Table IV of the concentrations of a "fair" eater, when seated with a "good" or "excellent" eater, show little consistency. When seated with the same child to eat the same vegetable prepared in the same form, one child's concentration varies from 0 to 100%. There seems to be no underlying pattern characterizing the daily eating behavior of these children. Possibly a child's eating habits are influenced by factors other than social contact, texture of food, or flavor. His general physical condition, degree of fatigue, amount of out-door activity, degree of hunger, state of emotional tension, or personal fondness for food may be other factors which affect the child's appetite, and consequently, his willingness to pay attention to business of eating.

TABLE III.

A STUDY OF THE INFLUENCE OF SOCIAL CONTACTS ON THE EATING CONCENTRATION OF SEVERAL CHILDREN.

Texture and Vegetable	Subject			
	Peter	Tom	Sister	Anne
Turnips-Pureed	27.8	77.8		
	100.0	40.0		
Turnips-Diced	50.0	42.9		
Turnips-Large Pieces	42.9	83.3		
Rutabaga-Mashed	100.0		52.6	
	00.0		80.0	
Rutabaga-Diced	41.7	50.0		
Rutabaga-Large Pieces	66.7	77.3		
Lima Beans-Whole	60.0			100.0
	62.5			100.0

	John	Jo Ann
Lima Beans-Whole	100.0	20.0
	66.0	100.0
Peas-Mashed	100.0	100.0
	100.0	40.0
Beets-Mashed	100.0	70.0
	100.0	75.0
Turnips-Pureed	100.0	50.0
Turnips-Large Pieces	100.0	58.0
Carrots-Diced	100.0	100.0
	100.0	56.0

In general, the eating habits of this group of children are good. One child, or 6.6% of the group, is definitely a "poor" eater; 33.3% are "fair" eaters, 46.6% rank as "good", and 13.3% have "excellent" eating habits. The total percentage concentrations of each child, given below, are taken from Table XXI.

TABLE IV..

THE EATING HABITS OF THE GROUP CLASSIFIED ACCORDING TO LEWIS' FOUR-POINT SCALE.

0-50% Concentration	50-65% Concentration	65-85% Concentration	85-100% Concentration.
Susan 39.3	Charles 50.1	Jo Ann 66.2	Kenney 89.4
	Harry 52.7	Angela 67.4	John 91.1
	Dale 55.4	Jimmy 67.5	
	Peter 57.6	Sister 68.6	
	Bingy 58.8	Gerry 68.8	
		Tom 75.7	
		Anne 83.2	

A DISCUSSION OF EACH CHILD'S EATING BEHAVIOR.

Charles

According to the four-point scale, Charles is a "fair" eater, by a very slight margin. His eating pattern shows a good degree of consistency. Although his average concentration at mealtime is below the average for all children in this study, it is good for this particular child. He is one of the youngest in the group, and when this study was begun he had not yet developed the muscular coordination which most children his

age have attained. He needed help in spooning his vegetables several times -- a fact which might affect his percentage concentration, since there was a possibility that he might finish eating his vegetable more quickly if he were physically able to handle it, or he might have been given help at a time when he would not have been eating voluntarily. His average percentage concentration for each vegetable-texture combination is given below. His average concentration for all vegetables and for all textures, taken from Table XXI, is compared with the average concentration of this group.

TABLE V.

CHARLES' AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Charles Conc. For Vegetable	Textures			
			Pureed	Mashed	Diced	Lg.Pieces
Beets	72.7	36.2	31.6	35.0	35.9	45.0
Carrots	70.6	57.4	70.8	63.2	58.3	65.7
Peas	66.6	63.6	46.9	80.0	63.9	
Lima Beans	61.5	46.1	32.5	47.9	63.0	
Turnips	57.9	44.9	63.9	27.3	21.5	25.0
Rutabaga	59.9	52.3	37.1	45.2	63.4	81.8
Charles' Avg. Conc. for Tex:			48.6	44.5	55.4	56.5
Group Avg. Conc. for Texture:			59.5	61.4	70.7	71.2

Charles is apparently less willing to eat beets, turnips or lima beans than he is to eat rutabaga, carrots or peas. His preferences as indicated by these figures are for diced and large

CHAPTER III.

THE FINDINGS OF THE PRESENT STUDY.

In analyzing the findings from the present study of the effect of texture on the preschool child's willingness to eat cooked vegetables, the reactions of the group as a whole are given for each vegetable and each texture, as well as the precentage concentration of each child, based on his own total eating time. Graphs representing the daily fluctuations in each child's eating pattern are given, followed by an appraisal of the individual's eating habits. Since this study is purely objective, only the most apparent reasons for extremes in the pattern are given, such as the removal of abnormal tonsils and adenoids or chronic colds, which obviously might be responsible for changes in the eating pattern.

The findings are all given in the form of arithmetic averages for two reasons: these data are not of the type that permit of statistical treatment; the most reliable criterion for measuring the child's acceptance of the vegetable or texture was found to be a percentage factor based on the length of time it took him to complete the vegetable compared with his actual eating time. No child ever had a second serving of the vegetable, and verbal comments were rarely made. Only three remarks were overheard throughout the experiment. During the preliminary period the same vegetable was used every day for a week, with variations only in texture. According to Nordholm's work on the

large pieces are also similar, and are more firm in texture; the concentrations for these two forms of vegetables (71.2% for large pieces, 70.7% for diced), vary only .5%.

TABLE I.

AVERAGE PERCENTAGE CONCENTRATION OF THE GROUP FOR EACH TEXTURE.

Texture	Number of Cases	Average Concentration
Pureed	117	59.5
Mashed	168	61.4
Diced	147	70.7
Large Pieces	77	71.2
Average For All Textures	--------	65.3

There is a difference of 10% between the two groups, which implies that the eating habits of these children are "good" when fed "firm" textured vegetables, and only "fair" when fed vegetables in "soft" forms. This is contrary to one of the ideas prompting this study, namely, that children seem to appear willing to eat textures which entail little chewing, that is, pureed or mashed, rather than diced or large pieces. On the other hand, it is known that many children object to soft foods. These findings indicate that part of the difficulty in feeding children vegetables might be overcome by changing the texture from a soft form to one that is more acceptable to the child. It is quite possible, therefore, that

some of the problems encountered in getting children to eat vegetables may be due to the form in which they are given rather than any prejudice against this class of food.

As shown in Table II this order of preference for vegetables among these children, as judged by the average concentrations of the group, is: beets, carrots, peas, lima beans, rutabagas and turnips.

TABLE II.

AVERAGE PERCENTAGE CONCENTRATION OF THE GROUP FOR EACH VEGETABLE.*

Vegetable	Number of Cases	Average Concentration
Beets	93	72.7
Carrots	102	70.6
Peas	66	66.6
Lima Beans	74	61.5
Rutabaga	83	59.9
Turnips	91	57.9
Average For All Vegetables ----------		65.1

The first three vegetables listed are more commonly used and have flavors with which most children are familiar; the more ready acceptance of this group may also be due, in part, to the sweet flavors of these vegetables. Lima beans might ordinarly be thought of as a strong-flavored vegetable, but

* For All Textures.

those used in this experiment were tender baby limas of excellent quality, and were fairly sweet in flavor -- a fact which might account for this vegetable's being fourth in order of preference. Rutabagas and turnips have more pronounced flavors, and are strong rather than sweet. These are the fifth and sixth choices in this study. The last three vegetables listed are ones which these children are not accustomed to eating, so that the flavor may have influenced their reaction toward them. There is a concentration difference of 14.8% between the first and sixth choices. The difference in concentration between the well-liked group (beets, carrots, peas) and the less well-liked group (lima beans, rutabagas, turnips) is 10.2%. This difference is significant enough to indicate that the eating habits of these children are "good" when a familiar vegetable or one with a sweet flavor is served, and are only "fair" when the vegetable offered is one which they are not so accustomed to eating or which has a strong flavor. The difference suggests that greater success in feeding children vegetables might be attained if the ones offered are mild and sweet in flavor, rather than strong or foreign to the child's daily eating habits.

Evaluation of Eating Habits.

In general, the eating habits of this group of children are "good" when rated according to the four-point scale used by Lewis and other workers in this field. This classification

ranks as "excellent" eaters children who apply themselves to their eating from 85 to 100 percent of the time at meals. Children whose attention is on eating from 65 to 85% of the total time rate as "good" eaters, while those who spend from 50 to 65% of the total time rate as "fair". The concentration is less than 50% of the total time for children who are considered "poor" eaters. The average percentage concentrations of each child in the present study are classified below according to this four-point scale. (Figures from Table XXII)*

TABLE III.

THE EATING HABITS OF THE GROUP CLASSIFIED ACCORDING TO LEWIS' FOUR-POINT SCALE.

Poor Eater 0 - 50% Concentration		Fair Eater 50 - 65% Concentration		Good Eater 65 - 85% Concentration		Excellent Eater 85 - 100% Concentration	
Susan	39.3	Charles	50.1	Jo Ann	66.2	Kenney	89.4
		Harry	52.7	Angela	67.4	John	91.1
		Dale	55.4	Jimmy	67.5		
		Peter	57.6	Sister	68.6		
		Bingy	58.8	Gerry	68.8		
				Tom	75.7		
				Anne	83.2		

Although the number of children in this study is small, the above picture suggests that the group is representative of preschool children in general. The distribution is what might be expected in any normal frequency curve, namely, relatively few cases in the extremes of the classification and the majority of cases grouped about a central or average point.

* Appendix.

Since this is the picture here, the findings from this study might be considered as fairly typical, on the whole, of the eating habits of most normal preschool children.

TABLE IV.

A STUDY OF THE INFLUENCE OF SOCIAL CONTACTS ON THE EATING CONCENTRATION OF SEVERAL CHILDREN.

Vegetable and Texture	Trial	"Fair" Eater	"Good" Eater	"Good" Eater	"Good" Eater
		Peter	Tom	Sister	Anne
Turnips-Pureed	1	27.8	77.8	-	-
	2	100.0	40.0	-	-
Turnips-Diced	1	50.0	42.9	-	-
Turnips-Large Pieces	2	42.9	83.3	-	-
Rutabaga-Mashed	1	100.0	-	52.6	-
	2	00.0	-	80.0	-
Rutabaga-Diced	1	41.7	50.0	-	-
Rutabaga-Large Pieces	2	66.7	77.3	-	-
Lima Beans-Whole	1	60.0	-	-	100.0
	2	62.5	-	-	100.0

Table IV (con't.)

Vegetable and Texture	Trial	"Excellent" Eater	"Good" Eater
		John	Jo Ann
Lima Beans-Whole	1	100.0	20.0
	2	86.0	100.0
Peas-Mashed	1	100.0	100.0
	2	100.0	40.0
Beets-Mashed	1	100.0	70.0
	2	100.0	75.0
Turnips-Pureed	1	100.0	50.0
Turnips-Large Pieces	2	10000	58.0
Carrots-Diced	1	100.0	100.0
	2	100.0	56.0

The Effects of Social Contacts.

The records of several children were analyzed to determine the effects of social contacts on a child's eating concentration at mealtime. The children were seated in the same groups for repeated servings of a certain vegetable. The texture of the vegetable was held constant. The examples given in Table IV of the concentrations of a "good" eater when seated with a "fair" or "excellent" eater, show little consistency. On the average, Peter was a "fair" eater, although his daily habits showed considerable fluctuation. Tom was generally a"good" eater, with some daily variation in his habits. When pureed turnips were served to these two children, seated together, the concentration of Peter, the "fair" eater was 27.8% on one occasion when Tom, the "good" eater attended to the business of eating 77.8% of the time. On another occasion, Peter, the "fair" eater had a concentration of 100% while Tom, the "good" eater, concentrated only 40% of the time. For a different vegetable-texture combination (whole lima beans) Peter concentrated 60 and 62.5% of his time in two trials, while Anne, usually a "good" eater, had 100% or perfect concentration. Apparently, the presence at the table of a child with different eating habits is not the influencing factor in determining a child's eating concentration. Another case might be cited which bears out this generalization. John, who is an "excellent" eater, sat with Jo Ann, a "good" eater, for two trials on mashed peas. His concentration was 100% each time, while Jo Ann

applied herself to eating 100% of the time on one occasion but only 40% on the second trial.

The figures from these trials studied for the effect of social contacts do not seem to indicate a positive effect of one child's average or daily eating habits on the eating concentration of another child. When texture, vegetable and one social factor are held constant, a child's behavior at mealtime seems to vary greatly. The findings from this study concerning social influence on eating habits are borne out by Ball, who found that the child's eating pattern was not influenced by sitting at a table with other children as opposed to being seated at a table by himself. Possibly there are other factors than these which have an effect on his application to the business of eating. The literature suggests general physical condition, degree of fatigue, amount of outdoor activity, degree of hunger, state of emotional tension or personal fondness for foods as factors which affect a child's willingness to concentrate his attention on the act of eating.

Each Child's Eating Behavior.

Charles.

According to the four-point scale, (Table XXII), Charles is a "fair" eater by a very slight margin. Although his average concentration at mealtime is below the average for all children in this study, it is good for this particular child. He is

one of the youngest in the group, and when this study was begun he had not yet developed the muscular coordination which most children his age have attained. Several times he needed help in spooning his vegetables -- a fact which might affect his percentage concentration, since there was a possibility that he might have finished eating his vegetable more quickly had he been physically able to handle the task. On the other hand, he might have been given help at a time when he would not have been eating voluntarily. His average concentration for each vegetable-texture combination is given below. His average concentration for all vegetables and for all textures, taken from Table XXI, is compared with the average concentration of this group.

TABLE V.

CHARLES' AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

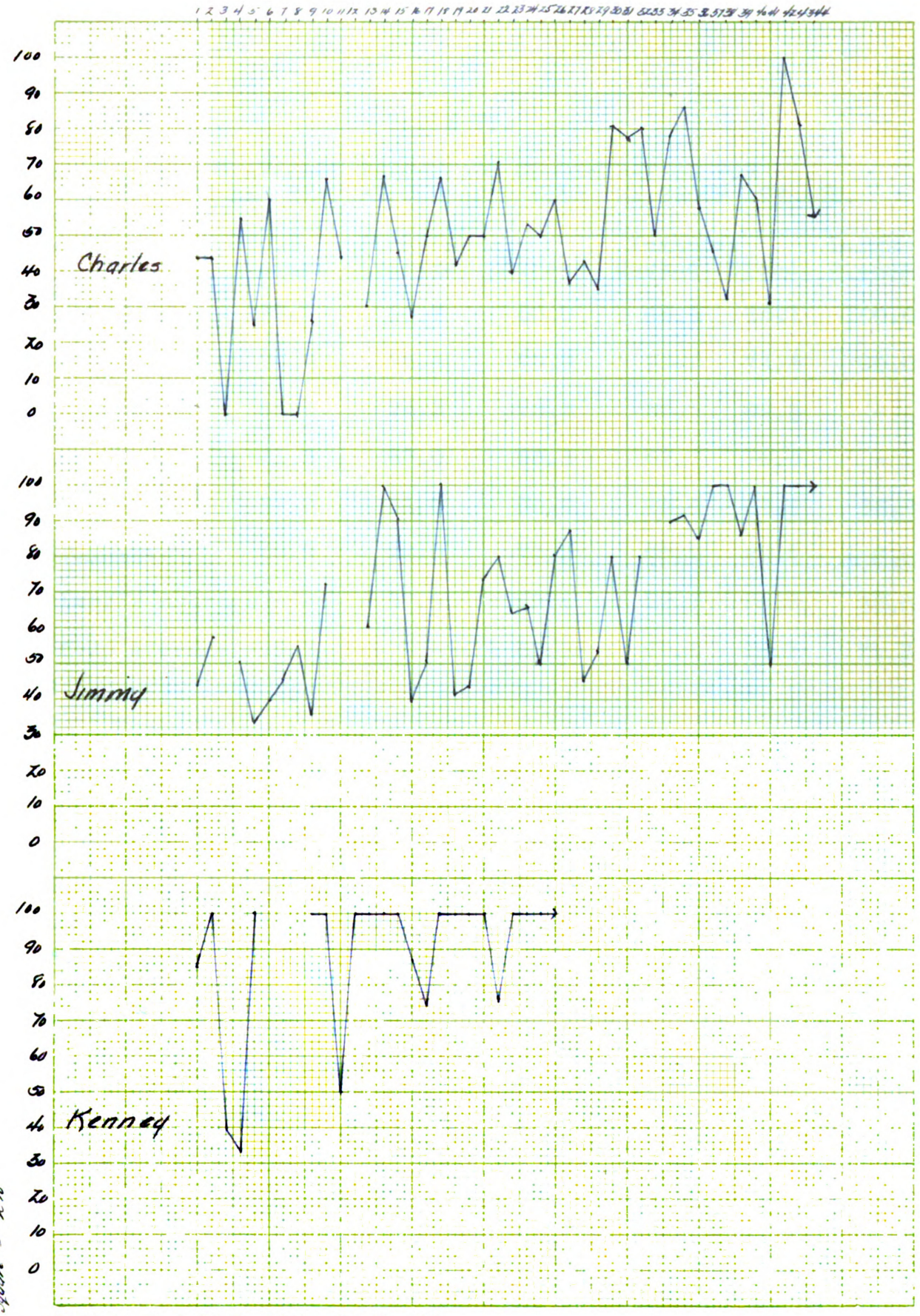
Vegetable	Group Average	Charles' Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	36.2	31.6	35.0	35.9	45.0
Carrots	70.6	57.4	70.8	63.2	58.3	65.7
Peas	66.6	63.6	46.9	80.0	63.9	-
Lima Beans	61.5	46.1	32.5	47.9	63.0	-
Turnips	57.9	44.9	63.9	27.3	21.5	25.0
Rutabaga	59.9	52.3	37.1	45.2	63.4	81.8
Charles' Average - - -		50.1	48.6	44.5	55.4	56.5
Group Average	65.5 - - - - - - -		59.5	61.4	70.7	71.2

Charles is apparently less willing to eat beets, turnips or lima beans than he is to eat rutabaga, carrots or peas. His preferences as indicated by these figures are for diced and large pieced vegetables rather than for the pureed or mashed textures. There is no apparent physical reason for Charles' having any appetite defects. The concentration percentages of this study are all calculated from the child's own total eating time rather than on any period of time set by the writer. Since Charles' figures are fairly consistent, it may be concluded that his average concentration for eating vegetables is "fair."

Jimmy.

Jimmy shows considerable fluctuation in his eating pattern. Like Charles, he sometimes had to be helped with the mechanics of the process. That this factor may have some effect upon his percentage figures might be indicated by the general trend of his graph. His social and play behavior were solitary at the beginning of the study, and at the conclusion of it, they had become group activities. Maturation undoubtedly has a subtle effect upon some children's willingness to eat or apparent interest in eating.

Daily Fluctuations in the Eating Patterns of Charles, Jimmy and Kenney.



1 square = 2%

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2 squares = 1 day.

TABLE VI.

JIMMY'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLES AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Jimmy's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	60.7	50.0	48.3	65.1	100.0
Carrots	70.6	76.4	70.9	75.0	71.5	90.0
Peas	66.6	74.3	73.3	80.0	69.5	-
Lima Beans	61.5	67.0	63.3	67.7	70.0	-
Turnips	57.9	51.0	50.0	25.0	61.9	33.3
Rutabaga	59.9	74.0	77.3	60.6	82.9	100.0
Jimmy's Average - - - -		67.5	65.1	59.7	70.1	85.6
Group Average -65.5- - - - - - -			59.5	61.4	70.7	71.2

These figures show a tendency for Jimmy to have certain preferences for texture as well as for vegetable. The averages for turnips indicate that he is less willing to eat that vegetable than he is to eat any of the others. His other concentration figures do not vary appreciably from one another. His averages for carrots, peas, lima beans, turnips and rutabaga are all higher than the group averages for these vegetables, whereas his average is 12% below the group average for the vegetable of greatest group preference, namely, beets. His concentration varies 25% for the four textures; his preference for texture apparently coincides with the group preferences for firm-textured vegetables.

Kenney.

Kenney is a robust, active child, with a normally healthy appetite for all foods. He is definitely an "excellent" eater and a consistently rapid one. From a survey of his percentage concentrations, there is no question about his partiality for vegetable or texture; he seems to accept the flavors of most vegetables readily and his willingness to eat different textures does not have an extreme effect on his general eating pattern.

TABLE VII.

KENNEY'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLES AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Kenney's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	97.6	-	100.0	92.9	100.0
Carrots	70.6	92.5	100.0	100.0	100.0	75.0
Peas	66.6	58.3	75.0	-	75.0	-
Lima Beans	61.5	100.0	100.0	-	100.0	-
Turnips	57.9	74.6	-	36.7	100.0	100.0
Rutabaga	59.9	92.9	-	85.7	100.0	-
Kenney's Average - - -		-89.4	87.5	82.4	95.6	85.0
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

In only one instance does Kenney's average concentration fall below that of the group -- this is in thecase of peas. His records show a consistent and definite unwillingness to eat this one vegetable. He has fairly low figures for turnips and rutabaga, but his records are not numerous enough to give

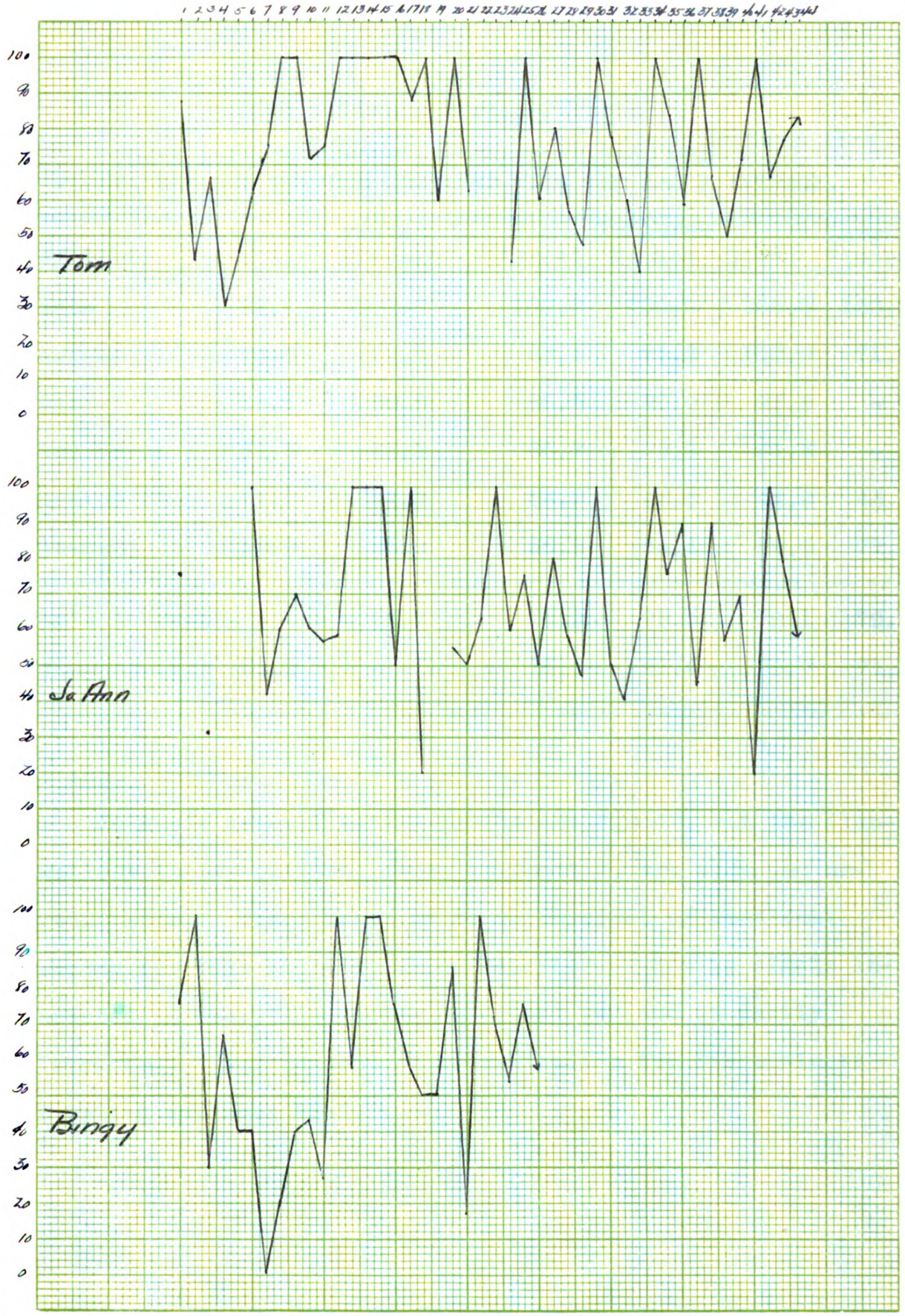
general averages for these vegetables. From the trends indicated by these figures, it might be concluded that if Kenney has any preferences in regard to eating vegetables, they are for flavor rather than for texture.

Tom.

Tom's concentration was more consistent at the beginning of the study than during the latter half, when his eating behavior was consistent only in the degree and general pattern of the fluctuations. (See Chart I.). This child shows definite preferences for flavor in foods, liking beets, lima beans and peas and definitely disliking turnips, as evidenced by his percentage concentration figures. His pained facial expression when he is eating turnips indicates a strong feeling against this particular flavor. His concentrations for beets, carrots, peas and lima beans are well above the group average for these vegetables.

The findings for texture indicate a slight preference for the firmer forms, but there is little variation in his concentration for any of the textures tested. Tom's eating habits as a whole are good.

Daily Fluctuations in the Eating Patterns of Tom, Jo Ann and Bingy.



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1 square = 2 days.

TABLE VIII.

TOM'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLES AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Tom's Average	Textures			
			Pureed	Mashed	Diced	Large Pieces
Beets	72.7	100.0	100.0	100.0	100.0	100.0
Carrots	70.6	77.2	63.4	71.3	100.0	71.4
Peas	66.6	80.9	68.8	80.0	93.8	-
Lima Beans	61.5	82.0	85.7	79.2	81.3	-
Turnips	57.9	54.0	58.9	48.3	44.2	45.5
Rutabaga	59.9	52.9	66.5	64.4	55.0	77.3
Tom's Average - - - - -		75.7	76.9	75.0	79.1	79.6
Group Average -65.5 - - - - - - -			59.5	61.4	70.7	71.2

Jo Ann.

Jo Ann's general eating habits are "good", but the fluctuations in her pattern, shown in Chart I, are wide and unpredictable. There seems to be no physical or emotional reasons for this child's eating behavior. She is simply interested in everything going on around her and is easily distracted. Her percent of concentration for the business of eating averages 66.2.

TABLE IX.

JO ANN'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

6

Vegetable	Group Average	Jo Ann's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	64.7	20.0	81.7	75.0	51.4
Carrots	70.6	73.9	-	76.7	77.8	65.9
Peas	66.6	74.4	53.2	70.0	100.0	-
Lima Beans	61.5	59.5	60.0	58.4	60.0	-
Turnips	57.9	52.4	56.3	31.3	60.0	-
Rutabaga	59.9	68.2	74.2	70.7	53.2	78.9
Jo Ann's Average - - -		66.2	56.4	69.7	72.0	53.6
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

The best figures in Jo Ann's table are for diced vegetables. In this case, the "diced" vegetables were peas which were served whole and classified as diced. This same texture classification was used for lima beans and again Jo Ann's best figures for this vegetable were in the whole-bean form. Her average concentration for "diced" texture was better than for any other texture. Her preference seems to be greater than the average of the group for mashed and diced vegetables and much lower than the group average for large pieces. Jo Ann's tendency seems to be to accept peas, carrots, rutabaga and beets more willingly than she accepts lima beans or turnips.

Bingy.

Bingy seems, from the figures, to dislike pureed and mashed vegetables and prefer diced and large pieces. His figures for the first two textures are consistently below the average for the group for these textures; his concentrations are above the group averages for the last two textures named. Bingy's concentrations for lima beans, peas, rutabaga and turnips are lower than the average for this study. He apparently likes beets and carrots better than the average child in this group.

TABLE X.

BINGY'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Bingy's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	74.5	-	57.4	87.5	100.0
Carrots	70.6	74.8	75.0	44.5	92.9	100.0
Peas	66.6	33.4	21.5	-	57.1	-
Lima Beans	61.5	30.6	31.5	00.0	45.0	-
Turnips	57.9	57.8	-	48.0	76.7	40.0
Rutabaga	59.9	66.1	-	75.0	57.1	-
Bingy's Average - - -		58.8	42.7	47.9	71.8	80.0
Group Average-65.5 - - - - - - -			-59.5	61.4	70.7	71.2

The fairly extreme fluctuations in Bingy's eating behavior are pictured in Chart I. His records are limited because he did not attend nursery school during the Spring term.

Peter.

Peter is, on the average, a "fair" eater. His eating pattern shows extreme fluctuations from day to day. His daily concentrations show very little consistency, whether based on vegetable or texture. His average eating habits do not vary greatly insofar as texture is concerned; his acceptance of all textures is poorer than the average for this group.

TABLE XI.

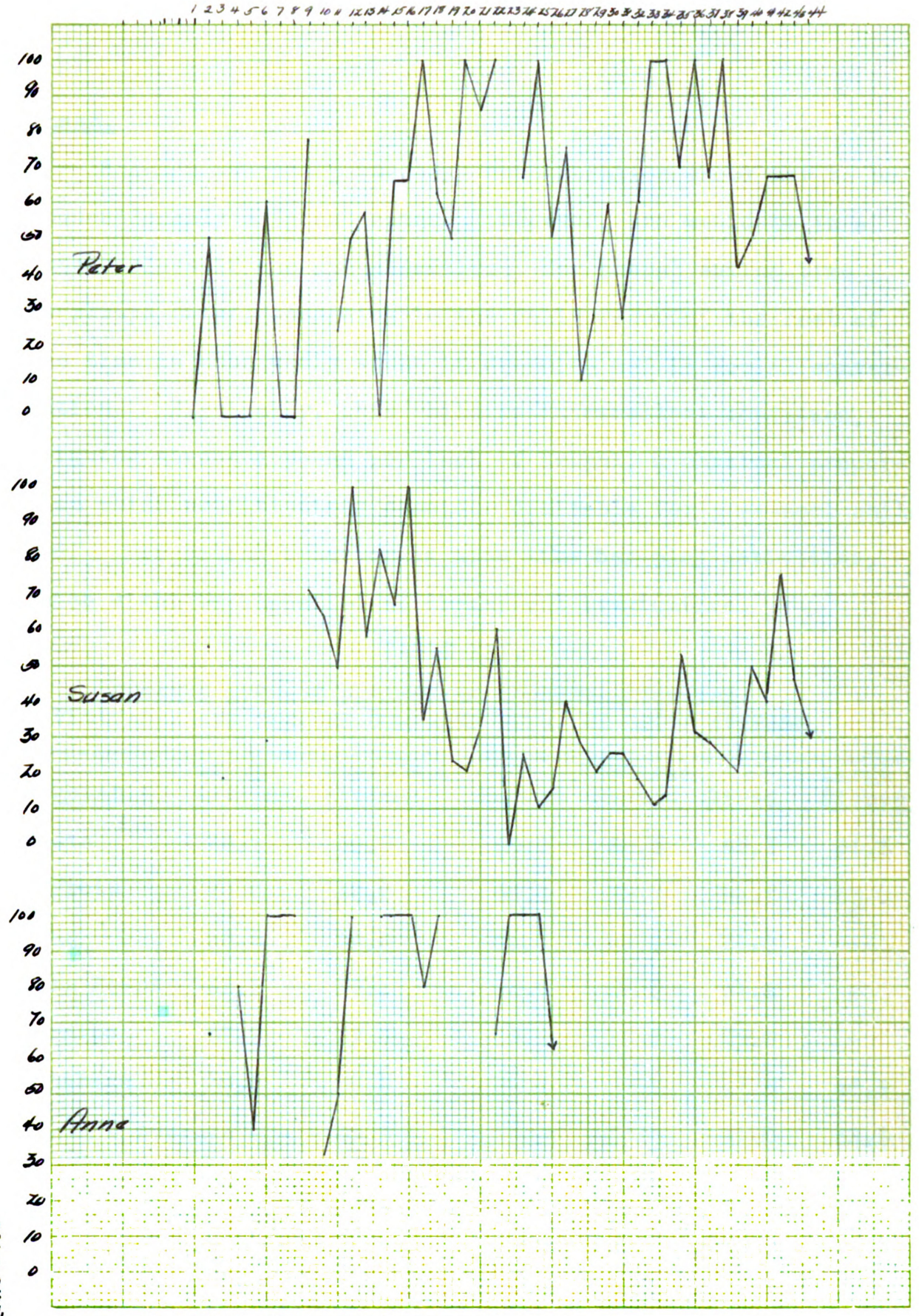
PETER'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Peter's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	68.9	66.7	78.3	66.6	58.4
Carrots	70.6	65.9	58.4	80.4	50.0	75.0
Peas	66.6	71.5	54.4	60.0	100.0	-
Lima Beans	61.5	38.5	00.0	35.0	61.3	-
Turnips	57.9	35.9	63.9	00.0	58.3	00.0
Rutabaga	59.9	49.7	55.0	43.1	45.9	66.7
Peter's Average - - -		57.6	53.0	51.1	63.7	53.8
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

The average percentages above indicate a definite dislike for the last three vegetables, and a greater preference for peas, beets and carrots.

Several factors are thought to influence this child's eating behavior. He breathes through his mouth most of the time, and often has the blank facial expression so frequently observed in people with enlarged adenoids.

Daily Fluctuations in the Eating Patterns of Peter, Susan and Anne.



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Susan.

Susan's average percentage concentration shows her to be unquestionably a "poor" eater. However, she would be in a "good" class if she ate steadily. Her actual eating time is always brief, according to the daily records; the rest of the time is observedly spent in dreaming and in social conversation. Physically, this child is in excellent condition, weighing almost a pound per inch of height, a physical proportion which nutritionists consider desirable for preschool children. Her eating behavior is much like her play activities, which might be classified as dreamy and imaginative.

TABLE XII.

SUSAN'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Susan's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	59.2	40.0	69.3	83.3	64.3
Carrots	70.6	42.6	48.6	36.7	51.7	55.0
Peas	66.6	24.3	41.7	21.6	24.0	-
Lima Beans	61.5	50.1	64.3	52.9	41.6	-
Turnips	57.9	27.4	18.3	18.1	39.8	-
Rutabaga	59.9	26.5	26.8	25.4	17.5	46.2
Susan's Average - - -		39.3	37.5	31.4	43.0	52.5
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

Susan's records show a preference for flavor in beets and the texture of large pieces. Other than this, her percentage concentrations are all very low.

Anne.

Anne is a "good" eater with an average concentration of 83.2%. Her eating chart shows some fluctuations, but the general trend marks her as an attentive eater. While the study was in progress, she had several absences due to colds which might in some measure account for the fluctuations. Her records do not furnish enough cases to show definite preferences for flavors or textures, but they tend to favor beets, carrots and lima beans over the other vegetables, and mashed and diced textures rather than pureed or large pieces.

TABLE XIII.

ANNE'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLES AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Anne's Average	Textures			Large Pieces
			Pureed	Mashed	Diced	
Beets	72.7	100.0	-	100.0	100.0	100.0
Carrots	70.6	88.9	-	100.0	100.0	66.6
Peas	66.6	65.0	50.0	-	80.0	-
Lima Beans	61.5	86.6	66.7	100.0	100.0	-
Turnips	57.9	71.7	-	80.0	83.3	40.0
Rutabaga	59.9	63.6	-	-	63.6	-
Anne's Average - - - -		83.2	61.1	95.0	90.0	68.9
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

On the whole, Anne seems willing to eat whatever food is served without being unduly influenced by flavor or texture. Her records are limited because she was not in school Spring term.

Dale.

Dale is a "fair" eater. Her lowest figures for turnips and rutabaga are in accord with those for the group as a whole. Her lowest preference is for the mashed texture, according to these records.

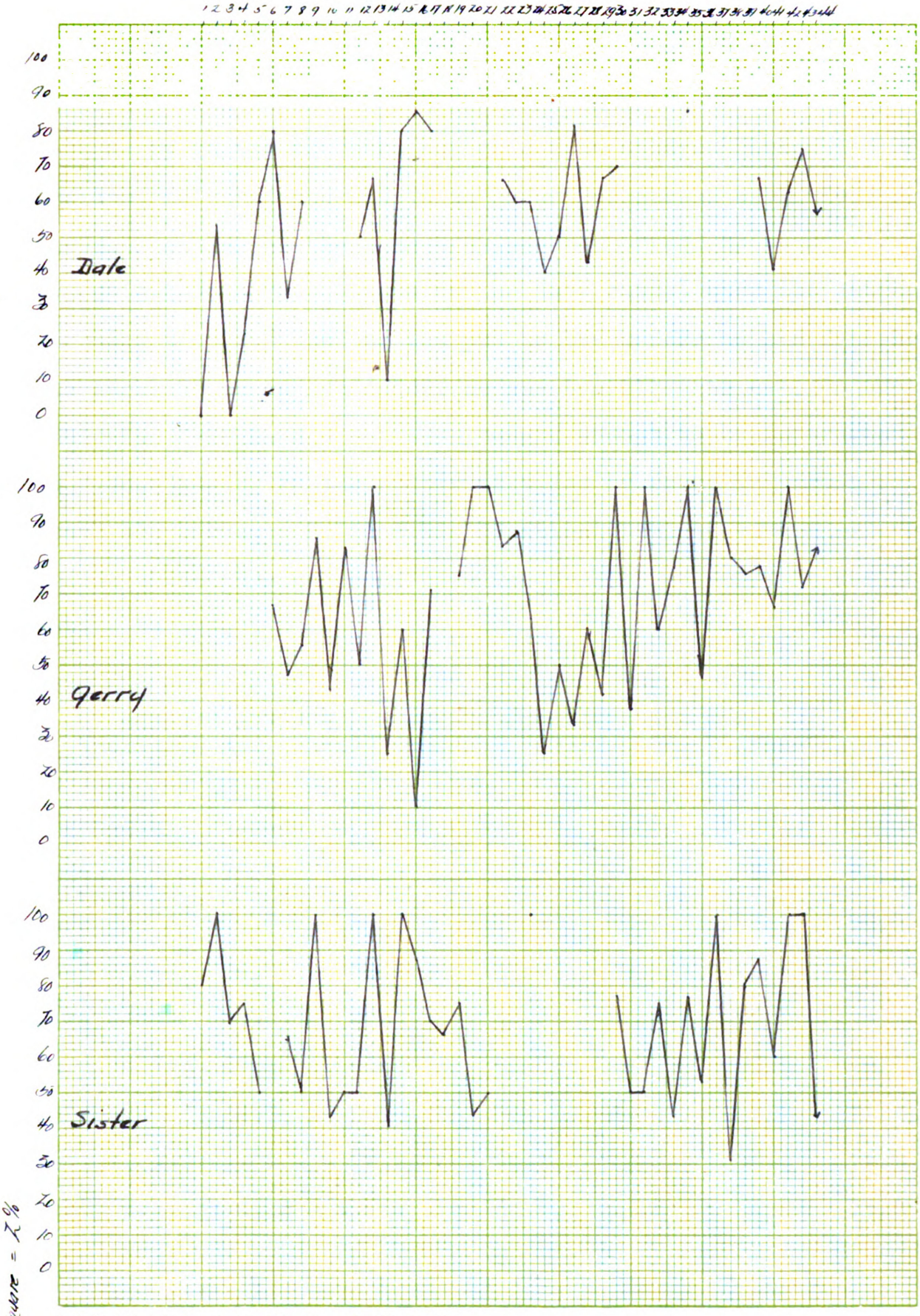
TABLE XIV.

DALE'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Dale's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	60.6	41.3	53.3	82.9	50.0
Carrots	70.6	56.3	62.5	70.9	10.0	66.7
Peas	66.6	75.0	-	70.0	80.0	-
Lima Beans	61.5	64.8	60.0	59.5	80.0	-
Turnips	57.9	45.4	-	11.1	56.7	60.0
Rutabaga	59.9	46.9	42.9	33.3	50.0	75.0
Dale's Average - - - -		55.4	54.2	47.8	57.4	50.1
Group Average-65.5 - - - - - - - -			59.5	61.4	70.7	71.2

The daily fluctuations in her eating behavior and poor concentration shown on the graph in Chart I might be partially due to nasopharyngeal difficulties. The child's tonsils have been removed three times, and her adenoids twice, yet she is repeatedly absent because of bad head colds. In appearance, she is a sturdy, chubby individual, but the records show her eating habits to be only fair. She finds many excuses to leave the table during lunch, and in general does not appear interested in food.

Daily Fluctuations in the Eating Patterns of Dale, Gerry and Sister.



1 square = 2%

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2 squares = 1 day.

Gerry.

Gerry is the youngest child in this study. Like Charles, he sometimes had to be given assistance with his spoon. As far as these records are concerned, he is a "good" eater. Three times during this study, when his eating concentration was low, he was put to bed before he had finished his lunch. On one occasion, he was too tired to eat; on the other two days he did not seem hungry enough to be interested in food, judging by the number of times he found an excuse to leave the table. He is a highly stimulated, extremely active child, whose physical condition is clearly reflected in his eating behavior.

TABLE XV.

GERRY'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Gerry's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	62.4	66.7	70.8	35.0	75.0
Carrots	70.6	64.7	87.5	73.6	62.5	80.6
Peas	66.6	88.8	91.7	100.0	74.6	-
Lima Beans	61.5	62.4	44.5	73.4	66.6	-
Turnips	57.9	60.8	48.8	-	62.5	-
Rutabaga	59.9	60.6	70.0	44.0	62.5	71.4
Gerry's Average - - -		68.8	69.2	72.3	59.8	77.8
Group Average-65.5 - - - - - - -			-59.5	61.4	70.7	71.2

The general upward trend of Gerry's graph is similar to Jimmy's. Gerry's percentage figures, shown above, indicate a

liking for the flavor of peas and carrots, and the textures of the large pieces and pureed vegetables.

Sister.

Sister's concentration is good but fluctuates rather widely from her 68.6% average. There are wide variations in her acceptance of textures, while her figures indicate dislike for the flavors of peas and lima beans.

TABLE XVI.

SISTER'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Sister's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	78.2	60.0	100.0	93.8	75.0
Carrots	70.6	66.1	87.5	50.0	41.9	87.5
Peas	66.6	56.6	50.0	63.5	58.5	-
Lima Beans	61.5	60.1	46.5	70.6	66.6	-
Turnips	57.9	70.3	62.5	72.1	100.0	50.0
Rutabaga	59.9	68.7	30.8	66.3	80.0	100.0
Sister's Average - -		68.6	58.4	72.3	73.1	55.1
Group Average-65.6 - - - - - -			59.5	61.4	70.7	71.2

In general, Sister is a slow eater, averaging about fifty minutes for her total lumch period. This slowness is characteristic of the child; every movement she makes is very deliberate. Sister is the one child in this group who sometimes shows selective eating by storing in her cheek some food she dislikes.

John.

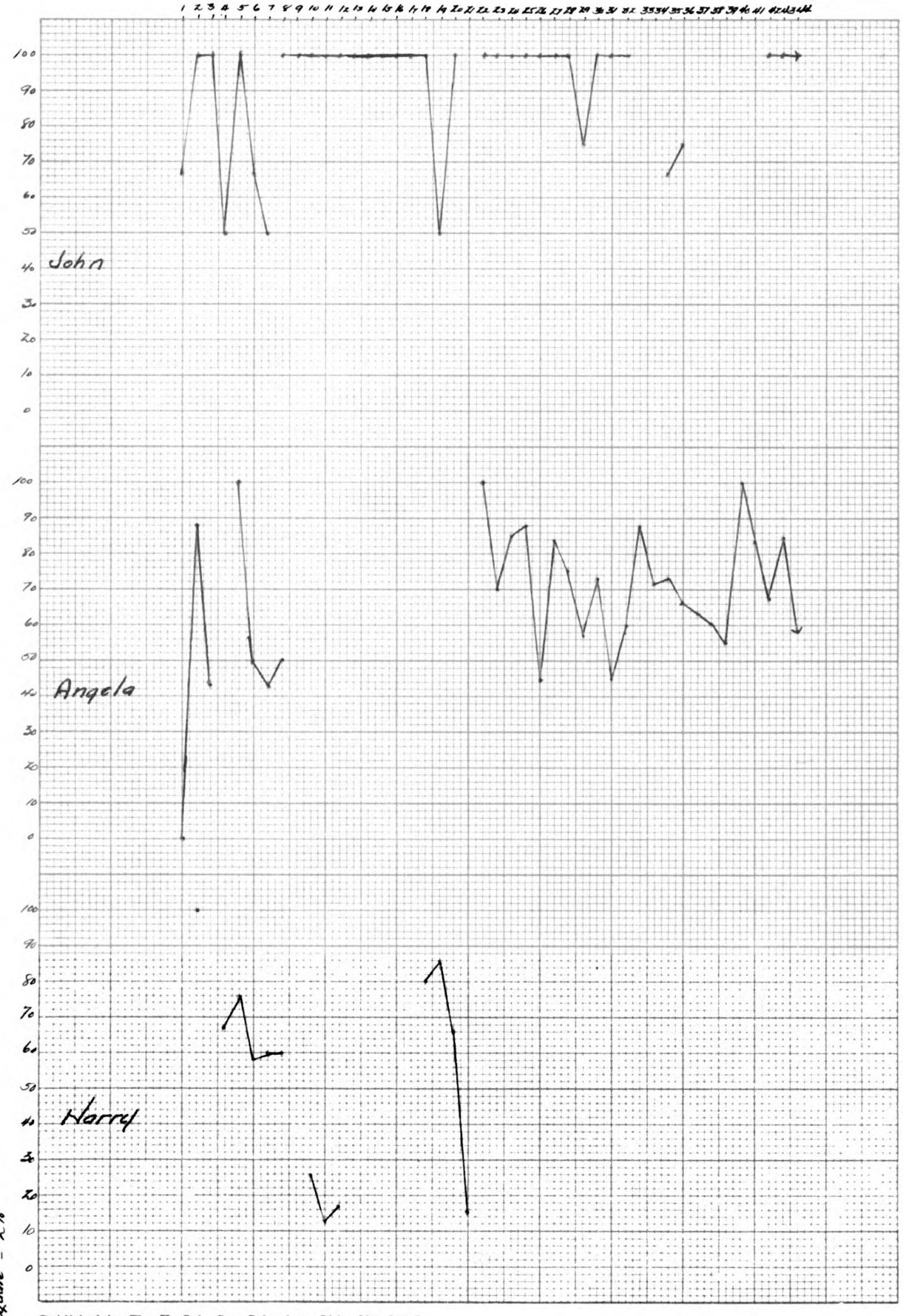
John is definitely and regularly an "excellent" eater. Even when his eating pattern (Chart V) drops to 50%, his concentration is comparatively far above the average child's, for this percentage is based on his own total eating time which never exceeded two minutes for any vegetable served. Therefore, every second John was out of attention caused an extreme fluctuation in his graph, because his total eating time was always so much less than the total time of most of the other children. The large break in John's graph is due to absence because of a tonsillectomy. The tonsils were not noticeably enlarged or diseased, but were removed on the advice of a physician. Neither the presence or removal of them seemed to affect John's eating pattern.

TABLE XVII.

JOHN'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	John's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	100.0	-	100.0	100.0	100.0
Carrots	70.6	92.9	75.0	100.0	100.0	100.0
Peas	66.6	100.0	100.0	100.0	100.0	-
Lima Beans	61.5	80.6	100.0	58.4	83.3	-
Turnips	57.9	92.9	100.0	75.0	100.0	100.0
Rutabaga	59.9	86.1	100.0	72.2	100.0	100.0
John's Average - - -		91.1	92.9	84.5	96.7	100.0
Group Average-65.5 - - - - -			59.5	61.4	70.7	71.2

Daily Fluctuations in the Eating Patterns of John, Angela and Harry.



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2 squares = 1 day.

Contrary to the trend of children in general, John does not like yellow vegetables or soft consistencies. He has frequently voiced a dislike for squash and sweet potatoes, which were not used in this experiment, but which are yellow in color and mealy in texture. John's lowest concentration in this study is for mashed lima beans, which are an example of such a texture. However, his concentration another day for pureed lima beans is 100%, indicating the influence of factors other than texture and personal liking on a child's willingness to eat vegetables.

Angela.

Angela shows the most extreme fluctuation at the beginning of the study. Her physical condition at that time was not good, and she was kept out of school to rest in preparation for a tonsillectomy. Since removal of the tonsils, her general spirits are better, she is more active in her play activities, and the level of her eating pattern shows a rise.

TABLE XVIII.

ANGELA'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Angela's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	78.1	83.3	87.5	-	63.6
Carrots	70.6	84.0	66.7	76.7	-	100.0
Peas	66.6	68.0	-	66.4	71.4	-
Lima Beans	61.5	53.8	50.0	57.5	50.0	-
Turnips	57.9	72.4	66.3	42.9	86.6	100.0
Rutabaga	59.9	55.2	67.5	00.0	49.5	84.2
Angela's Average	- -	67.4	66.8	58.8	65.6	84.4

Her percentage concentrations are similar to those of the group as a whole -- lower for soft textures, and higher for the firmer diced and large piece forms.

Harry.

Harry's records are limited because of his many absences and his failure to return to school after the spring vacation. The records are used because they cover half the experimental period, and are typical of the fluctuations found in so many children's eating habits. Harry's concentration varies from 14% to 86% for one texture, showing little consistency. His average eating concentration is "fair" -- 52.7%.

TABLE XIX.

HARRY'S AVERAGE PERCENTAGE CONCENTRATION FOR VEGETABLE AND TEXTURE COMPARED WITH THE GROUP AVERAGE.

Vegetable	Group Average	Harry's Average	Textures Pureed	Mashed	Diced	Large Pieces
Beets	72.7	16.7	-	-	-	16.7
Carrots	70.6	55.9	85.7	15.4	66.6	-
Peas	66.6	14.4	14.4	-	-	-
Lima Beans	61.5	56.7	42.5	60.0	69.2	-
Turnips	57.9	81.9	-	66.6	100.0	100.0
Rutabaga	59.9	-	-	-	-	-
Harry's Average - -		52.7	39.9	47.3	76.2	45.7
Group Average-65.5 - - - - - -			59.5	61.4	70.7	71.2

From an intensive study of the individual eating practices of the group, it can be seen that fluctuations in the concentration from day to day appear to be a normal part of the eating pattern of preschool children. There is no way of predicting from one day to the next whether even a healthy child will attend to the business of eating. However, records taken over a long period of time will give a basis for judging whether, in general, a child is an "excellent", "good", "fair", or "poor" eater.

CHAPTER IV.

SUMMARY AND CONCLUSIONS.

Summary.

This problem was undertaken in order to study the effect of texture on the preschool child's willingness to eat cooked vegetables. Six vegetables were used, namely, beets, carrots, peas, lima beans, rutabagas and turnips; each vegetable was prepared so as to give four textures: pureed, mashed, diced and large pieces which the child would have to cut. The profile method was the technique adopted for recording each child's eating habits; the thirty-second interval was used to record his attention to the eating of the vegetable. This method was similar to the methods used by Tupper, Lewis, and Ball in studying the eating habits of children. It was also used by Van Alstyne in studying the play behavior and choice of play materials of preschool children.

In the present study, a two weeks' preliminary trial period was carried on in connection with the regular nursery school lunch. During this period, the method used in recording the data for the present study was worked out to suit the conditions under which the experiment was to be conducted.

The subjects used for this study were the fifteen children who are regularly enrolled in the nursery school. The actual experiment covered a period of 44 days, during which time 509 profile records were taken. Any verbal comments made by the

children were studied. The time actually spent by each child in eating was studied in relation to the total time he took to complete the vegetable.

Using percentage concentration for all vegetables and all textures as a measure of the child's application to the business of eating, it was found that 13.3% of the group could be classified as "excellent" eaters, 46.6% as "good" eaters, 33.3% as "fair" eaters, and only 6.6% as "poor". In other words, the concentration for 60% of the group ranged between 65-100 percent. This would classify their eating habits as "good" so far as their attitude toward vegetables is concerned.

The average percentage concentration of the group for texture ranged from 59.5% for pureed vegetables to 71.2% for vegetables served in large pieces. The average of all subjects for all textures was 65.3%. This would designate their eating practices as "good" so far as their attitude toward the texture of the vegetables is concerned.

The order of preference of the group for texture, as expressed by percentage concentration, was: large pieces, diced, mashed, and pureed. The concentrations for large pieces and diced varied only .5%; the concentrations for mashed and pureed varied only .9%. Between these two groups of firm and soft textures, there was a concentration difference of 10%, which would classify the eating habits of these children in regard to vegetables as "good" for large pieces and diced (firm textures) and "fair" for mashed and pureed (soft textures). The

effect of texture on a child's acceptance of vegetables bears further investigation; since this study indicates that by changing the texture of a vegetable a child's attitude toward eating it may be raised from "fair" to "good". Hence, it seems evident that part of the difficulty in feeding children vegetables might be due to the texture as well as to the flavor of the vegetable.

The average concentration of the group for vegetables was 72.7% for beets, 70.6% for carrots, 66.6% for peas, 61.5% for lima beans, 59.5% for rutabagas, and 57.9% for turnips. In relation to flavor, these children preferred those flavors which were sweet and mild and with which they were most familiar; namely, beets, carrots and peas. Their average concentration for this group of vegetables was almost 70%. The average for lima beans, rutabagas and turnips, vegetables which are stronger in flavor and which these children had not been accustomed to eating, was 60%. The difference of 10% classified the behavior of the subjects of this study as "good," when eating vegetables which had mild flavors which they were familiar with, and "fair" when eating vegetables which had stronger flavors or flavors which they were not so accustomed to being served. The flavor, then, might have some influence on the readiness with which a child accepts vegetables.

The effect of social contacts on a child's application to eating was studied. It was found that the concentration of these children was apparently uninfluenced by the seating com-

binations at the tables. It would seem, then, that putting a "poor" eater at the same table with a "good" eater would have little influence on his attention to his meal. This is in accord with the findings of Ball, whose study showed that there was no apparent difference in the eating concentration of children whether seated alone or in groups.

A study was made of the daily fluctuations in each child's eating pattern throughout the period. A child's eating habits vary from day to day, but over a long period of time his average concentrations indicate whether he is, in general, an "excellent", "good", "fair", or "poor" eater.

Conclusions.

The following conclusions may be derived from the present study:

1. Texture and flavor undoubtedly have some influence on a child's willingness to eat cooked vegetables.

2. The findings suggest that children prefer firm textures, such as large pieces or diced, as opposed to soft textures, such as mashed or pureed.

3. Children prefer flavors which are mild and sweet and with which they are familiar, such as the flavors of beets, carrots, and peas.

4. Personal likes and dislikes play some part in determining a child's eating pattern from day to day.

5. The presence of other children at the table during mealtime apparently has little effect upon a child's application to the business of eating.

6. A child's eating pattern fluctuates from day to day, but over a long period of time his averages indicate whether he is, in general, an "excellent", "good", "fair", or "poor" eater.

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APPENDIX

TABLE XX

AVERAGE PERCENTAGE CONCENTRATION OF ALL CHILDREN FOR EACH VEGETABLE AND TEXTURE

Vegetable	Total Percentage Concentration for PUREED	Number of Cases	Group Average for Each Vegetable PUREED	Total Percentage Concentration for MASHED	Number of Cases	Group Average for Each Vegetable MASHED	Total Percentage Concentration for DICED	Number of Cases	Group Average for Each Vegetable DICED	Total Percentage Concentration for LARGE PIECES	Number of Cases	Group Average for Each Vegetable LARGE PIECES	Total Number of Cases	Total Percentage Concentration	Group Average Each Vegetable - All Textures
CARROTS	1588.9	22	72.2	2125.6	32	66.4	1789.4	25	71.6	1698.0	22	77.2	102	7201.9	70.6
BEETS	559.6	10	55.9	2647.1	36	73.5	2035.6	26	78.3	1523,3	21	72.5	93	6765.6	72.7
PEAS	1258.1	23	54.7	1512.8	21	72.4	1627.8	22	74.0	—	—	—	66	4398.7	66.6
LIMA BEANS	1420.3	25	56.8	1417.7	24	59.1	1712.2	25	68.5	—	—	—	74	4550.2	61.5
TURNIPS	1027.4	18	57.1	925.7	23	40.2	1933.3	27	71.6	1380.5	23	50.0	91	5266.9	57.9
RUTABAGA	1102.2	19	58.0	1691.3	31	54.6	1300.0	22	59.1	881.5	11	80.1	83	4975.0	59.9
Total	6956.5	117		10320.2	168		10398.3	147		5483.3	77				
Group Average All Vegetables Each Texture			59.5			61.4			70.7			71.2			

TABLE XXI.

PERCENTAGE CONCENTRATION OF EACH CHILD FOR EACH VEGETABLE AND TEXTURE

Veg.:	BEETS				CARROTS				PEAS			LIMA BEANS			TURNIPS				RUTABAGA				Total Percentage Concentration for Each Case - All Vegetables - All Textures	Total Number of Cases	Individual Average Concentration for All Vegetables - All Textures
Tex:	P	M	D	L	P	M	D	L	P	M	L	P	M	L	P	M	D	L	P	M	D	L			
Charles	31.6	50.0	45.0	45.0	41.7	40.0	50.0	71.4	43.8	80.0	50.0	00.0	00.0	60.0	77.8	00.0	53,3	25.0	42.9	42.9	60.0	81.8	2205.3	44	50.1
	—	25.0	26.7	—	100.0	36.4	66.6	60.0	50.0	80.0	77.8	65.0	85.7	66.0	50.0	54.5	42.9	55.6	31.4	35.7	66.7	—			
	—	30.0	—	—	—	50.0	—	—	—	—	—	—	—	—	—	—	—	—	—	57.1	—	—			
Jimmy	50.0	50.0	91.7	100.0	41.7	62.5	42.9	80.0	73.3	80.0	50.0	54.5	44.5	40.0	50.0	00.0	66.6	33.3	44.4	42,9	80.0	100.0	2836.3	42	67.5
	—	35.0	38.5	—	100.0	87.5	100.0	100.0	—	80.0	88.9	72.1	90.9	100.0	—	50.0	57.1	100.0	100.0	53.3	85.7	—			
	—	60.0	—	—	—	73.3	—	—	—	—	—	—	—	—	—	—	—	—	—	85.7	—	—			
Kenney	—	100.0	100.0	100.0	100.0	100.0	100.0	75.0	50.0	—	75.0	100.0	—	100.0	—	40.0	100.0	100.0	—	85.7	100.0	—	2144.7	24	89.4
	—	100.0	85.7	—	—	100.0	100.0	—	100.0	—	—	—	—	—	—	—	33.3	100.0	—	—	—	—			
	—	100.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Tom	100.0	100.0	100.0	100.0	60.0	80.0	100.0	71.4	75.0	100.0	87.5	100.0	75.0	62.5	77.7	66.6	45.5	45.5	56.3	87.5	60.0	77.3	3252.8	43	75.7
	—	100.0	100.0	100.0	66.7	62.5	100.0	—	62.5	60.0	100.0	71.4	83.3	100.0	40.0	30.0	42.9	83.3	66.7	47.4	50.0	—			
	—	100.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	58.3	—	—			
Jo Ann	20.0	75.0	100.0	58.3	—	100.0	55.5	62.5	56.4	100.0	100.0	60.0	41.8	100.0	50.0	31.3	60.0	58.3	58.3	75.0	50.0	78.9	2645.8	40	66.2
	—	70.0	50.0	44.4	—	80.0	100.0	69.2	50.0	40.0	100.0	60.0	75.0	20.0	62.5	—	—	—	90.0	47.1	56.3	—			
	—	100.0	—	—	—	50.0	—	—	—	—	—	—	—	—	—	—	—	—	—	90.0	—	—			
Bingy	—	75.0	100.0	100.0	50.0	71.4	85.7	100.0	26.3	—	57.1	20.0	00.0	40.0	—	29.4	53,3	40.0	—	75.0	57.1	—	1645.3	28	58.8
	—	40.0	75.0	—	100.0	16.7	100.0	—	16.7	—	—	42.9	—	50.0	—	66.6	100.0	—	—	—	—	—			
	—	57.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Peter	66.7	100.0	66.6	50.0	50.0	75.0	100.0	100.0	23.1	60.0	100.0	00.0	00.0	60.0	27.8	00.0	66.6	00.0	10.0	00.0	50.0	66.7	2475.3	43	57.6
	—	77.8	66.6	66.7	66.7	85.7	100.0	50.0	85.7	60.0	100.0	—	70.0	62.5	100.0	00.0	50.0	42.9	100.0	29.4	41.7	—			
	—	57.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100.0	—	—			
Susan	40.0	10.0	66.6	100.0	22.2	00.0	20.0	60.0	50.0	25.0	35.0	64.3	52.9	28.6	25.0	18.1	25.0	30.0	28.6	20.0	15.0	46.2	1570.3	40	39.3
	—	71.4	100.0	28.6	75.0	33.3	83.3	50.0	33.3	18.2	1.3	—	—	54.5	11.5	—	54.5	—	25.0	30.8	20.0	—			
	—	57.1	—	—	—	40.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Anne	—	100.0	100.0	100.0	—	100.0	100.0	66.6	50.0	—	80.0	100.0	100.0	100.0	—	80.0	100.0	40.0	—	—	63.6	—	1580.1	19	83.2
	—	—	100.0	—	—	—	—	—	—	—	—	33.3	—	100.0	—	—	66.6	—	—	—	—	—			
Dale	41.3	40.0	80.0	50.0	62.5	60.0	10.0	66.6	—	70.0	80.0	60.0	33.3	80.0	—	00.0	60.0	60.0	42.9	00.0	50.0	75.0	1607.3	29	55.4
	—	66.6	85.7	—	—	81.8	—	66.7	—	—	—	—	85.7	—	—	22.2	53.3	57.1	—	66.6	—	—			
Gerry	66.7	25.0	60.0	50.0	75.0	87.5	100.0	83.3	83.3	100.0	71.4	55.6	46.7	66.6	37.5	—	62.5	83.3	60.0	41.7	50.0	71.4	2683.4	38	70.6
	—	87.5	10.0	100.0	100.0	33.3	25.0	77.8	100.0	100.0	77.8	33.3	100.0	—	60.0	—	—	—	80.0	46.2	75.0	—			
	—	100.0	—	—	—	100.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
Sister	60.0	100.0	100.0	50.0	75.0	50.0	43.8	87.5	50.0	76.9	70.0	50.0	64.3	66.6	50.0	69.2	100.0	50.0	30.8	80.0	80.0	100.0	2539.8	37	68.6
	—	100.0	87.5	100.0	100.0	—	40.0	—	50.0	50.0	42.9	42.9	76.9	—	75.0	75.0	100.0	42.9	—	52.6	—	—			
Harry	—	—	—	16.7	85.7	15.4	66.6	—	13.3	—	—	60.0	60.0	58.3	—	66.6	100.0	75.0	—	—	—	—	738.0	14	52.7
	—	—	—	—	—	—	—	—	15.4	—	—	25.0	—	80.0	—	—	—	—	—	—	—	—			
Angela	83.3	87.5	—	63.6	66.7	70.0	—	100.0	—	72.7	71.4	50.0	42.3	50.0	45.0	42.9	85.7	100.0	75.0	00.0	44.4	84.2	2022.3	30	67.4
	—	—	—	—	—	83.3	—	100.0	—	60.0	—	—	72.7	—	87.5	—	87.5	58.3	60.0	57.1	54.5	—			
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66.7	—	—			
John	—	100.0	100.0	100.0	50.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	50.0	66.6	100.0	50.0	100.0	100.0	100.0	66.6	100.0	100.0	3371.3	37	91.1
	—	100.0	100.0	—	100.0	100.0	100.0	—	—	100.0	—	—	100.0	66.7	—	100.0	100.0	100.0	—	75.0	—	—			
	—	100.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	75.0	—	—			
																						TOTAL	33318.0	509	
																						AVERAGE	65.5		

Texture; P - Pureed D - Diced W - Whole, classified as diced
M - Mashed L - Large Pieces

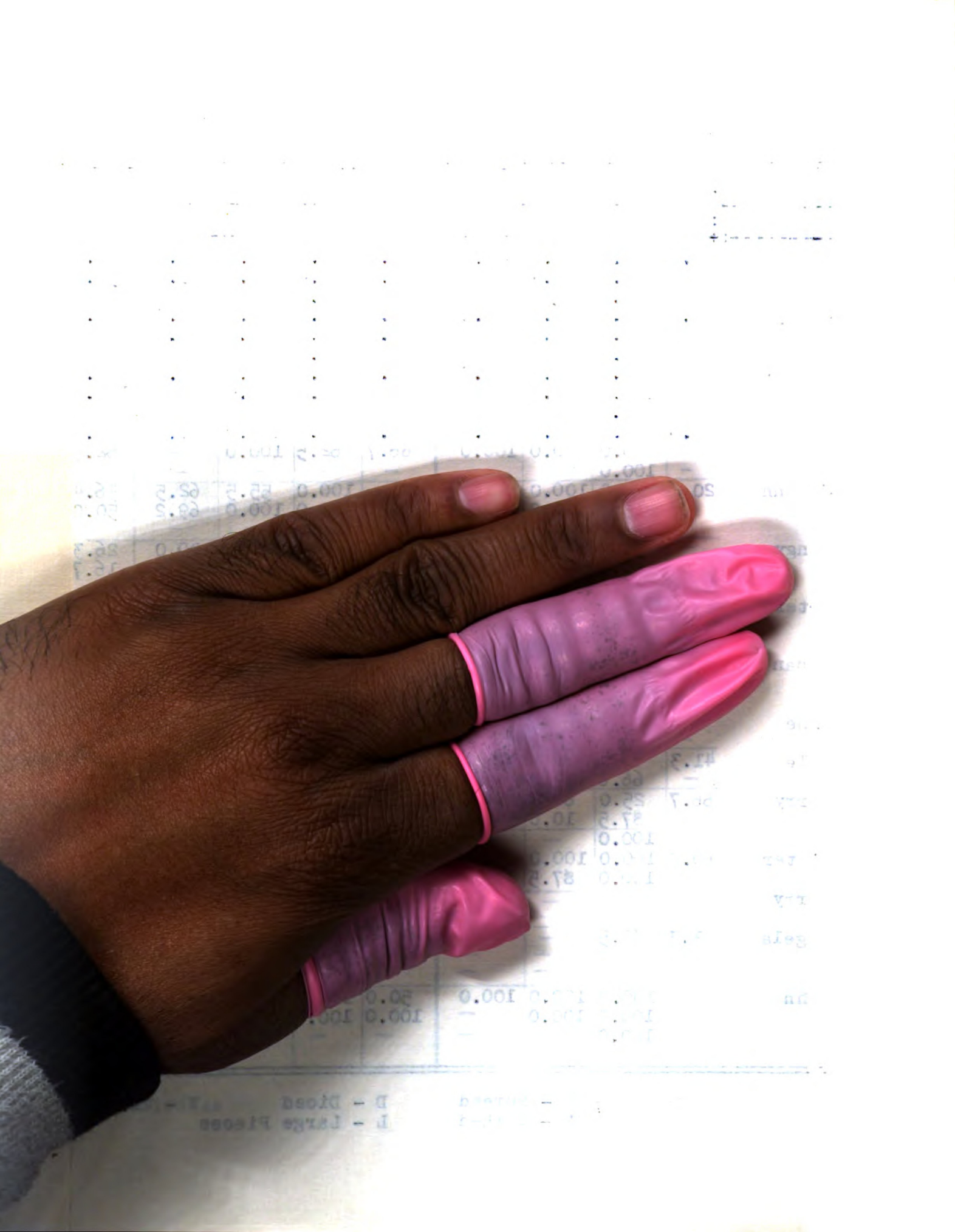

TABLE XXII

APPRAISAL OF EACH CHILD'S EATING CONCENTRATION ACCORDING TO LEWIS' FOUR-POINT SCALE

Subject	Vegetable:	Beets				Carrots				Peas			Lima Beans			Turnips				Rutabagas							
	Texture:	P	M	D	L	P	M	D	L	P	M	D	P	M	D	P	M	D	L	P	M	D	L	P	F	G	E
Charles	Concentrations	P	F	P	P	P	P	F	G	P	G	F	P	P	F	G	P	F	P	P	P	F	G	19	14	9	2
		—	P	P	—	E	P	F	F	F	G	G	G	E	G	F	F	P	F	P	P	G	—				
		—	P	—	—	—	F	—	—	—	—	—	—	—	—	—	—	—	—	—	F	—	—				
Jimmy		F	F	E	E	P	F	P	G	G	G	F	F	P	P	F	P	F	E	P	P	G	E	10	10	8	14
		—	P	P	—	E	E	E	E	—	G	E	G	E	E	—	F	G	P	E	F	E	—				
		—	F	—	—	—	G	—	—	—	—	—	—	—	—	—	—	—	—	—	E	—	—				
Kenney		—	E	E	E	E	E	E	G	F	—	G	E	—	E	—	P	E	E	—	E	E	—	2	1	2	19
		—	E	E	—	—	E	E	—	E	—	—	—	—	—	—	P	E	—	—	—	—	—				
		—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Tom		E	E	E	E	F	G	E	G	G	E	E	E	G	F	G	G	P	P	F	E	F	G	6	9	12	16
		—	E	E	E	G	F	E	—	F	F	E	G	G	E	P	P	P	G	G	P	F	—				
		—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	F	—	—				
Jo Ann		P	G	E	F		E	F	F	F	E	E	F	P	E	F	P	F	F	F	G	F	—	7	16	7	10
		—	G	F	P		G	E	G	F	P	E	F	G	P	F	—	—	—	E	P	F	G				
		—	E	—	—		F	—	—	—	—	—	—	—	—	—	—	—	—	—	E	—	—				
Bingy		—	G	E	E	F	G	E	E	P	—	F	P	P	P	—	P	F	P	—	G	F	—	10	6	5	7
		—	P	G	—	E	P	E	—	P	—	—	P	—	F	—	G	E	F	—	—	—	—				
		—	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Peter		G	E	G	F	F	G	E	E	P	F	E	P	P	F	P	P	G	P	P	P	F	G	13	10	10	10
		—	G	G	G	G	E	P	F	E	F	E	—	G	F	E	P	F	P	E	P	P	—				
		—	F	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E	—	—				
Susan		P	P	G	E	P	P	P	F	F	P	P	F	F	P	P	P	P	P	P	P	P	P	26	8	4	2
		—	G	E	P	G	P	G	F	P	P	P	—	—	F	P	—	F	—	P	P	P	—				
		—	F	—	—	—	P	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Anne		—	E	E	E	—	E	E	G	F	—	G	E	E	E	—	G	E	P	—	—	F	—	2	2	4	11
		—	—	E	—	—	—	—	—	—	—	—	P	—	E	—	—	G	—	—	—	—	—				
Dale		P	P	G	F	F	F	P	G	—	G	G	F	P	G	—	P	F	F	P	P	F	G	7	10	10	1
		—	F	G	—	—	G	—	G	—	—	—	—	E	—	—	P	F	F	—	G	—	—				
Gerry		G	P	F	F	G	E	E	G	G	E	G	F	P	G	P	—	F	G	G	P	F	G	9	7	12	11
		—	E	P	E	E	P	P	G	E	E	G	P	E	—	F	—	—	—	F	P	G	—				
		—	E	—	—	—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
Sister		F	E	E	E	G	F	P	E	F	G	G	F	F	G	P	G	E	F	P	G	G	E	7	10	10	10
		—	E	E	F	E	—	P	—	F	F	P	P	G	—	G	G	E	P	—	F	—	—				
Harry		—	—	—	P	E	F	F	—	P	—	—	F	F	F	—	G	E	G	—	—	—	—	4	5	3	2
		—	—	—	—	—	—	—	—	P	—	—	P	—	G	—	—	—	—	—	—	—	—				
Angela		G	E	—	F	G	G	—	E	—	G	G	F	P	F	P	P	E	E	G	P	P	G	5	7	11	7
		—	—	—	—	—	G	—	E	—	F	—	—	G	—	E	—	E	F	G	F	F	—				
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G	—	—				
John		—	E	E	E	F	E	E	E	E	E	E	E	F	G	E	F	E	E	E	G	E	E	0	3	6	28
		—	E	E	—	E	E	E	—	—	E	G	E	G	E	—	E	E	E	—	G	—	—				
		—	E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G	—	—				

Texture:
P - Pureed
M - Mashed
D - Diced
L - Large Pieces

Concentration:

P - Poor	0 - 50%
F - Fair	50 - 65%
G - Good	65 - 85%
E - Excellent	85 -100%

TABLE XXIII.

DAILY FLUCTUATION IN PERCENTAGE CONCENTRATION OF EACH CHILD

Subject	Veg-Tex. R - M	T - D	T - M	T - M	T - L	L - W	L - M	L - P	B - M	L - P	P - P	B - L	B - M	C - D	B - D	B - D	P - W	L - W	C - P	C - D	P - P
Charles	42.9	42.9	00.0	54.5	25.0	60.0	00.0	00.0	25.0	65.0	43.8	—	30.0	66.6	45.0	26.7	50.0	66.6	41.7	50.0	50.0
Jimmy	42.9	57.1	00.0	50.0	33.3	40.0	44.5	54.5	35.0	72.1	—	—	60.0	100.0	91.7	38.5	50.0	100.0	41.7	42.9	73.3
Kenney	85.7	100.0	40.0	33.3	100.0	—	—	—	100.0	100.0	50.0	100.0	100.0	100.0	100.0	85.7	75.0	100.0	100.0	100.0	100.0
Tom	87.5	42.9	66.6	30.0	45.5	62.5	75.0	100.0	100.0	71.4	75.0	100.0	100.0	100.0	100.0	100.0	87.5	100.0	60.0	100.0	62.5
Jo Ann	75.0	—	31.3	—	—	100.0	41.8	60.0	70.0	60.0	56.4	58.3	100.0	100.0	100.0	50.0	100.0	20.0	—	55.6	50.0
Bingy	75.0	100.0	29.4	66.6	40.0	40.0	00.0	20.0	40.0	42.9	26.3	100.0	57.1	100.0	100.0	75.0	57.1	50.0	50.0	85.7	16.7
Peter	00.0	50.0	00.0	00.0	00.0	60.0	00.0	00.0	77.8	—	23.1	50.0	57.1	00.0	66.6	66.6	100.0	62.5	50.0	100.0	85.7
Susan	—	54.5	18.1	—	—	28.6	—	—	71.4	64.3	50.0	100.0	57.1	83.3	66.6	100.0	35.0	54.5	22.2	20.0	33.3
Anne	—	66.6	—	80.0	40.0	100.0	100.0	100.0	—	33.3	50.0	100.0	—	100.0	100.0	100.0	80.0	100.0	—	—	—
Dale	00.0	53.3	00.0	22.2	60.0	80.0	33.3	60.0	—	—	—	50.0	66.6	10.0	80.0	85.7	80.0	—	—	—	—
Gerry	—	—	—	—	—	66.6	46.7	55.6	87.5	33.3	83.3	50.0	100.0	25.0	60.0	10.0	71.4	—	75.0	100.0	100.0
Sister	80.0	100.0	69.2	75.0	50.0	—	64.3	50.0	100.0	42.9	50.0	50.0	100.0	40.0	100.0	87.5	70.0	66.6	75.0	43.8	50.0
John	66.6	100.0	100.0	50.0	100.0	66.6	50.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	50.0	100.0	—
Angela	00.0	87.5	42.9	—	100.0	50.0	42.3	50.0	—	—	—	—	—	—	—	—	—	—	—	—	—
Harry	—	100.0	—	66.6	75.0	58.3	60.0	60.0	—	25.0	13.3	16.7	—	—	—	—	—	80.0	85.7	66.6	15.4

Subject	C - L	C - M	T - D	B - M	R - D	C - M	R - P	R - M	P - M	T - P	P - M	T - P	P - W	L - M	R - M	B - L	R - P	R - D	C - L	B - P	C - P	R - L	T - L	AVERAGE
Charles	71.4	40.0	53.3	50.0	60.0	36.4	42.9	35.7	80.0	77.8	80.0	50.0	77.8	85.7	57.1	45.0	31.3	66.7	60.0	31.6	100.0	81.8	55.6	50.1
Jimmy	80.0	62.5	66.6	50.0	80.0	87.5	44.4	53.3	80.0	50.0	80.0	—	88.9	90.9	85.7	100.0	100.0	85.7	100.0	50.0	100.0	100.0	100.0	67.5
Kenney	75.0	100.0	100.0	100.0	100.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	89.4
Tom	—	—	45.5	100.0	60.0	80.0	56.3	47.4	100.0	77.8	60.0	40.0	100.0	83.3	58.3	100.0	66.7	50.0	71.4	100.0	66.7	77.3	83.3	75.7
Jo Ann	62,5	100.0	60.0	75.0	50.0	80.0	58.3	47.1	100.0	50.0	40.0	62.5	100.0	75.0	90.0	44.4	90.0	56.3	69.2	20.0	100.0	78.9	58.3	66.2
Bingy	100.0	71.4	53.3	75.0	57.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	58.8
Peter	100.0	—	66.6	100.0	50.0	75.0	10.0	29.4	60.0	27.8	60.0	100.0	100.0	70.0	100.0	66.7	100.0	41.7	50.0	66.7	66.7	66.7	42.9	57.6
Susan	60.0	00.0	25.0	10.0	15.0	40.0	28.6	20.0	25.0	25.0	18.2	11.5	13.0	52.9	30.8	28.6	25.0	20.0	50.0	40.0	75.0	46.2	30.0	39.3
Anne	66.6	100.0	100.0	100.0	63.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	83.2
Dale	66.6	60.0	60.0	40.0	50.0	81.8	42.9	66.6	70.0	—	—	—	—	85.7	—	—	—	—	66.7	41.3	62.5	75.0	57.1	55.4
Gerry	83.3	87.5	62.5	25.0	50.0	33.3	60.0	41.7	100.0	37.5	100.0	60.0	77.8	100.0	46.2	100.0	80.0	75.0	77.8	66.7	100.0	71.4	83.3	70.6
Sister	—	—	100.0	—	—	—	—	—	76.9	50.0	50.0	75.0	42.9	76.9	52.6	100.0	30.8	80.0	87.5	60.0	100.0	100.0	42.9	68.6
John	100.0	100.0	100.0	100.0	100.0	100.0	100.0	75.0	100.0	100.0	100.0	—	—	66.7	75.0	—	—	—	—	—	100.0	100.0	100.0	91.1
Angela	100.0	70.0	85.7	87.5	44.4	83.3	75.0	57.1	72.7	45.0	60.0	87.5	71.4	72.7	66.7	63,6	60.0	54.5	100.0	83.3	66.7	84.2	58.3	67.4
Harry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52.7

Vegetable: B - Beets
C - Carrots
P - Peas
L - Lima Beans
R - Rutabaga
T - Turnips

Texture: P - Pureed
M - Mashed
D - Diced
L - Large Pieces
W - Whole classified as large pieces.

TABLE XXIV.

TOTAL TIME SPENT BY EACH CHILD ON EACH VEGETABLE VERSUS ACTUAL EATING TIME

Vegetable	R-M	T-D	T-M	T-M	T-L	L-W	L-M	L-P	B-M	L-P	C-P	B-L	B-M	C-D	B-D	B-D	P-W	L-W	C-P	C-D	P-P	R-L	C-L	C-M	T-D	B-M	R-D	C-M	R-P	R-M
Charles	7 7	7 3	10 0	5½ 3	6 1½	2½ 1½	11 0	11 0	10 2½	10 6½	8 3½	—	10 3	1½ 1	10 4½	7½ 2	6 3	6 4	6 2½	7 3½	6 3	7 3	3½ 2½	10 4	7½ 4	8 4	10 6	11 4	7	7
Jimmy	7 3	7 4	10 0	4 2	6 2	5 2	11 5	11 6	10 3½	7 5½	—	—	2½ 1½	1 1	6 5½	6½ 2½	6 3	2½ 2½	6 2½	7 3	7½ 5½	8 4	5 4	4 2½	7½ 5	8 4	10 8	4 3½	4½ 2	7½ 4
Kenney	3½ 3	½ ½	2½ 1	1½ ½	1 1	—	—	—	2½ 2½	½ ½	2 1	1½ 1½	½ ½	1 1	½ ½	3½ 3	2 1½	1 1	1 1	½ ½	½ ½	2 2	2 1½	1 1	1 1	1 1	½ ½	—	—	—
Tom	4 3½	7 3	4½ 3	5 1½	5½ 2½	4 2½	4 3	3 3	2 2	3½ 2½	2 1½	1 1	½ ½	½ ½	½ ½	2½ 2½	4 3½	5 5	2½ 1½	1 1	4 2½	10 5	— —	— —	5½ 2½	2 2	5 3	2½ 2	8 4½	9½ 4½
Jo Ann	6 4½	— —	8 2½	— —	— —	1 1	12 5	5 3	5 3½	5 3	8 4½	6 3½	6 6	½ ½	3 3	9 4½	2½ 2½	5 1	— —	4½ 2½	4 2	10 3	4 2½	2 2	5 3	4 3	9 4½	2½ 2	6 3½	8½ 4
Bingy	6 4½	1 1	8½ 2½	1½ 1	5 2	5 2	15 0	10 2	5 2	7 3	9½ 2½	1½ 1½	3½ 2	1 1	1 1	4 3	7 4	6 3	5 2½	3½ 3	3 ½	2½ 2	2 2	3½ 2½	7½ 4	2 1½	3½ 2	— —	— —	— —
Peter	6 0	6 3	10 0	10 0	10 0	5 3	11 0	10 0	4½ 3½	— —	6½ 1½	1 ½	7 4	10 0	3 2	3 2	2 2	4 2½	2 1	3 3	3½ 3	3½ 2	1½ 1½	— —	3 2	2 2	6 3	2 1½	10 1	8½ 2½
Susan	— —	5½ 3	5½ 1	— —	— —	7 2	— —	— —	3½ 2½	7 4½	10 5	1 1	3½ 2	3 2½	3 2	2 2	10 3½	5½ 3	9 2	10 2	4½ 1½	10 0	2½ 1½	10 0	10 2½	10 1	10 1½	5 2	7 2	10 2
Anne	— —	3 2	— —	2½ 2	2½ 1	1 1	2 2	1½ 1½	— —	3 1	1 ½	1 1	— —	½ ½	1 1	1 1	2½ 2	1 1	— —	— —	— —	— —	1½ 1	½ ½	½ ½	1 1	5½ 3½	— —	— —	— —
Dale	6 0	7½ 4	10 0	4½ 1	2½ 1½	2½ 2	3 1	2½ 1½	— —	— —	— —	2 1	6 4	10 1	2½ 2	3½ 3	2½ 2	— —	— —	— —	— —	— —	3 2	5 3	5 3	5 2	10 5	5½ 4½	3½ 1½	6 4
Gerry	— —	— —	— —	— —	— —	1½ 1	7½ 3½	4½ 2½	4 3½	4½ 1½	3 2½	1 ½	1½ 1½	6 1½	5 3	10 1	3½ 2½	— —	2 1½	1½ 1½	1½ 1½	4 2	3 2½	4 3½	4 2½	4 1	10 5	12 4	2½ 1½	6 2½
Sister	2½ 2	2 2	6½ 4½	2 1½	2 1	— —	7 4½	4 2	4½ 4½	3½ 1½	10 5	1 ½	3 3	5 2	2½ 2½	4 3½	5 3½	4½ 3	2 1½	8 3½	6 3	4½ 4	— —	— —	1 1	— —	— —	— —	— —	— —
Harry	— —	1 1	— —	1½ 1	2 1½	6 3½	10 6	5 3	— —	6 1½	15 2	6 1	— —	— —	— —	— —	— —	2½ 2	3½ 3	4½ 3	6½ 1	3 3	— —	— —	— —	— —	— —	— —	— —	— —
John	1½ 1	½ ½	1 1	1 ½	1 1	1½ 1	2 1	2 2	2 2	1½ 1½	½ ½	½ ½	½ ½	½ ½	½ ½	1 1	½ ½	1 1	1 ½	1 1	— —	— —	½ ½	½ ½	½ ½	½ ½	1½ 1½	½ ½	½ ½	2 1½
Angela	6 0	4 3½	7 3	— —	2 2	5 2½	13 5½	6 3	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	1½ 1½	5 3½	3½ 3	4 3½	9 4	3 2½	2 1½	7 4

Vegetable	P-M	T-P	P-M	T-P	P-W	L-M	R-M	B-L	R-P	R-D	C-L	B-P	C-P	T-L	R-L
Charles	7 3½	4½ 3½	7 3½	4 2	4½ 3½	7 6	7 4	10 4½	8 2½	7½ 5	5 3	9½ 3	2½ 2½	4½ 2½	11 9
Jimmy	7 3½	4 2	7 3½		4½ 4	5½ 5	3½ 3	5 5	2 2	3½ 3	4 4	7 3½	2 2	3½ 2½	4½ 4½
Kenney	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Tom	3½ 3½	4½ 3½	2½ 1½	2½ 1	1½ 1½	6 5	6 3½	1½ 1½	3 2	5 2½	7 5	1½ 1½	1½ 1	3 2½	11 8½
Jo Ann	2 2	6 3	2½ 2	4 2½	2½ 2½	4 3	5 4½	9 4	5 4½	8 4½	6½ 4½	7½ 1½	1½ 1½	6 3½	9½ 7½
Bingy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Peter	5 3	9 2½	2½ 1½	2 2	1½ 1½	5 3½	2 2	4½ 3	1½ 1½	6 2½	2 1	3 2	1½ 1	7 3	6 4
Susan	6 1½	8 2	11 2	13 1½	11½ 1½	8½ 4½	6½ 2	7 2	6 1½	7½ 1½	8 4	2½ 1	2 1½	10 3	13 7
Anne	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dale	5 3½	—	—	—	—	3½ 3	—	—	—	—	7½ 5	8 3½	4 2½	3½ 2	8 6
Gerry	3½ 3½	8 3	2½ 2½	2½ 1½	4½ 3½	2 2	6½ 3	3½ 3½	2½ 2	2 1½	4½ 3½	4½ 3	2 2	3 2½	3½ 2
Sister	6½ 5	5 2½	6 3	4 3	7 3	6½ 5	9½ 5	5 5	6½ 2	2½ 2	4 3½	5 3	2 2	3½ 1½	5 5
Harry	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
John	½ ½	1½ 1½	1 1	— —	— —	1½ 1	2 1½	— —	— —	— —	— —	— —	1½ 1½	1 1	1½ 1½
Angela	5 4	10 4½	5 3	4 3½	3½ 2½	5½ 4	6 4	5½ 3½	5 3	5½ 3	3 3	3 2½	4½ 3	6 3½	9½ 8

Vegetable: B - Beets; C - Carrots; P - Peas; L - Lima Beans; T - Turnips; R - Rutabaga

Texture: P - Pureed; M - Mashed; D - Diced; L - Large Pieces; W - Whole, classified as diced