Participatory Research with Third Graders: An Exploratory Study of School Lunch Plate-waste

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Summary

A class of American third-grade children (aged 9-10 years) participated in the planning and implementation of an exploratory study of their own school-lunch plate-waste and that of all third graders at Cragmont School, Berkeley, California. The total plate-waste from one meal selected by the students as neither popular nor unpopular was 48% of the food served. Waste by item included milk 77% and burger buns 61%. The least waste was of fresh apple 26%. A questionnaire developed with the students was administered to all third graders' (n=100), both school-lunchers and pack-lunchers. Their proposals for reducing waste included moving cafeteria tables and benches into the school yard on fine days (52%), being allowed to sit where they wanted (49%), and participation in menu planning (40%). Ninety percent of the students considered that a longer recess (recently reduced to thirty minutes) would effectively reduce waste. The study demonstrates *inter alia* that participatory research can be successfully undertaken with 9-10 year-old children.

Introduction

This study was designed to explore the use of participatory research as a medium for nutrition education and to undertake a participatory study of problems related to school-lunch plate-waste in one grade school.

Participatory research is defined by Bud Hall as "research that is planned and conducted with the active participation of the research subjects" (1). Schwab has traced the roots of its application in the field of community nutrition to numerous disciplines, including philosophy, anthropology, social psychology, psychiatry and environmental design (2). By making full use of "local knowledge" about phenomena to be studied, participatory research potentially enables a researcher to (a) rapidly identify appropriate variables for quantitative study; (b) develop appropriate interpretations of quantitative data collected; and (c) plan highly acceptable programs.

The subject of this study was waste of foods provided to children participating in the National School Lunch Program (NSLP) at one grade school. The NSLP was set up in 1946 both to provide nutritious, reasonably-priced lunches and nutrition education to American schoolchildren, and as an outlet for surplus agriculutural commodities. By 1985, it was the third largest catering organization in the U.S., serving some 25 million lunches in 94,000 schools on an average school day. Approximately 60% of all schoolchildren in the public schools participate in the program, which accounts for 98% of the surplus agricultural commodities donated by the Federal Government to domestic food programs, at a cost to the taxpayer of approximately $900 million per annum (3)

While the nutrient content of the meals has consistently received attention throughout the 40 years of the NSLP, the amount of food actually consumed by the children has rarely been studied, and then only during the last 15 years. Studies by Harper and Jansen (4), and Head and Weeks (5), indicate that plate-waste varies from one menu to another, and depends on numerous factors, including the preparation site, the age of the children, seasonal and other environmental factors. Figures for plate-waste are typically reported at between 0% and 50%. Harper and Jansen, for example, report a mean of 29.4% by weight among fifth graders, with

waste of individual menu items including: milk 12.2%; bread, cereal products and chips 28%; beans, peas and corn 44.6%; and other vegetables 64.8%.

A nationwide study by the U.S. Department of Agriculture includes a review of the literature concerning plate-waste and attempts to reduce it, and the recommendation that further studies be undertaken, especially with a view to stimulating the interest of students in the program and increasing their participation (6). The present study was intended to fulfil, in small part, that recommendation and, more importantly, to do so using the methods of participatory research. This is consistent with with recent recognition that those most directly involved may be able to explain why waste occurs, and how it may be reduced (7,8). Thus the selection of variables in this study was undertaken with the children. In addition, this was the first participatory exploration of plate-waste with such young children.

Origins of this Study

This study emerged from an experimental series of nutrition classes for third graders undertaken by the author at Cragmont School (kindergarten to third grade) in Berkeley, California. The series was offered weekly for fifteen weeks to one class (n=29). Each session was 40 minutes long. The first six sessions were given to presentation of the principles of nutrition. During the sixth session, the school lunch program was discussed and the question of waste was raised. The proposal was made that the class study plate-waste for the remainer of the series, both as a research exercise, and in an attempt to reduce what appeared to be high levels of waste. This proposal was accepted by the class teacher.

Environment of the Study

The School consists of three concrete buildings clustered around a small triangular courtyard, and a fine school yard surrounded by grassy and rocky banks. The cafeteria is located at the lowest level of the main building. Like most of the classrooms it seems to have been designed to permit a minimum of daylight to enter. At the time of the study it was a large, spotlessly clean, high-ceilinged room,

lit by neon strip lights. The walls were monochrome and bare. The floor was covered with linoleum. Meals were eaten at eight long plastic-topped, metal tables, each with a pair of benches chained along either side.

The kitchen adjoined the cafeteria. It was bright and well designed for food preparation, with stainless steel fittings, but was no longer fully equipped for cooking, since meals had for some years been prepared at a central site, needing only to be warmed in the school ovens before serving. School lunches were being served to about 150 children each day. Another 200 children were bringing pack-lunches from home. The school rules required that all lunches be eaten in the cafeteria, and that everyone eat at the table assigned to their class.

The cafeteria was open for lunch between noon and 1pm. The arrival of each class was staggered to avoid lines and overcrowding at the tables. As a result of a new contract with teachers concerning supervisory duties, the recess time (for eating and play) had recently been reduced to thirty minutes.

Methods and Materials

Nine sessions of the class series were given to this study, specifically: observation and discussion of plate-waste (one session); planning waste-measurement and questionnaire development (two); testing waste-measurement procedures (one); testing questionnaire (one); analysis of test results & finalization of questionnaire (one); weighing plate-waste by food for all third graders (one); analysis and discussion of results (one); presentation of results to all third graders (one).While the author and the class teacher provided constant guidance and support, many of the fundamental planning decisions and implementation tasks were provided by the students.

The following collection procedure was established and tested prior to the day of the study. Five plastic buckets were set up in the cafeteria, each labelled with the name of one of the foods on the menu. Each bucket was manned by one student. Each student's plate waste was scraped into the appropriate buckets. After lunch, the contents of each bucket was transferred to plastic bags and weighed by other students using small platform balances. Unopened cartons of milk were retained whole, and

their labelled weight recorded. Samples were subsequently check-weighed on electronic balances at the University of California, Berkeley.

The questionnaire (Appendix 1) was developed by group processes over two class sessions: all the children participated in the selection of variables, the design of the questions and the development of methods for data collection. The questionnaire was pre-tested by the research class and revised before being administered to all third graders after lunch on the day selected for the study.

The meal selected for the test was identified by 75% of the children as neither popular nor unpopular. It consisted of a surfburger (a deep-fried, ground-fish pattie) in a white wheat bun, canned corn, fresh apple slices and low-fat milk. The collection and weighing procedures decribed above were implemented for all third grade students eating school lunch on the day this menu was served (n=53). All third graders (n=100) were given the questionnaire to complete during the first class period after lunch.

The results of the study were collated and analysed with the research class, and subsequently presented by a small team of students to the other third grade classes.

Results

On the day of the study, 53 students ate school lunch and 47 a pack lunch. Overall plate waste of the school lunch was high: 48% of the food served. This was the average of the following figures for waste by food: surfburgers 38%, buns 61%, corn 37%, apples 26%, milk 78%.

The questionnaire was completed by all the children during the first class after the recess. Of the 53 school-lunchers, 13 (25%) said they ate all of it, 36 (70%) ate part, and 2 (4%)that they ate none. Of the 38 children who threw food away, 37% said they did so because they didn't like it, 27% because they were in a hurry to get out and play, and 21% because the portions were too large.

The most fruitful question for planning purposes dealt with ways to cut down on waste. The students were invited to check their 4 favorite solutions from a list of 12

developed by the research class. Five proposals to reduce waste emerged ahead of the rest: 90% thought that a longer recess would be effective, 52% for tables outside in the schoolyard during warm weather; 49% for being allowed to sit where they wanted; 42% for a more pleasant eating environment; and 40% for student participation in menu-planning.

Another useful set of answers was given to the question -- what do you like about school lunches? Most children answered with a list of foods. In order of the proportion of respondents who mentioned them, these foods were: pizza (59%), hot dog 38%, taco (29%), chicken nuggets (29%), corn dog (18%), hamburger, milk, burrito, apple, orange juice (5% each).

Discussion and conclusions

Level of plate-waste. Carefully supervised plate-waste weighing revealed a high level of waste. This might have been higher or lower on other days, with other menus. The high waste of milk (78%) was particularly surprising, as milk is generally regarded as highly acceptable to this age group. However, during our class analysis of the results, several students reported that the lunchtime milk sometimes tastes sour. The relatively high wastage of buns is also worth further exploration. 21% of the children who threw part of their lunch away said that the portions were too large for them, and 17% of all the third-graders suggested that half portions be available.

Environmental factors. The students' twelve original suggestions for reducing waste (questionnaire item 9) included a number of environmental issues that were reported to influence plate-waste. The most important was undoubtedly the length of the recess. Given the function of the recess, which is to provide for play and refreshment, 30 minutes appears to be extraordinarily short. Observations of the children at lunch showed clearly how they would bolt their food and hurry outside for fresh air, play and free companionship.

The reduction of the recess time thus appeared to have a negative nutritional effect not only on the children's food intake, but also on the refreshing interaction that

can occur when meals are eaten wiothout haste in good company. These apparent effects of the reduced time need to be examined in greater detail.

More accessible to change was the immediate spatial and social environment. In a location where the sun shines for most of the year, and in a school with delightful grounds, it seemed sensible to permit the children to eat outside, especially when the recess was so short. The provision of trash bins, benches and tables in a pleasant, convenient outdoor spot, and allowing the students (at least those in the third grade) to sit where they wanted, might well have improved the eating envionment sufficiently to reduce plate-waste. As even this step would increase the workload on kitchen staff (who were consulted at every stage of the study) it was also proposed that students be organized on a rotational basis to ensure that trash bins were used and to assist in cleaning up.

45% of the respondents considered that a nicer cafeteria environment would reduce waste. In class discussion, this finding was interpreted to suggest some innovative experimentation: murals, posters, the provision and maintenance of plants, music and room dividers were all suggested by the children.

Food Quality. Only one of the variables identified by the children for reducing waste related to the quality of the food served: the proposal that children be allowed to participate in menu-planning. This was surprising in view of the fact that 37% of the school-lunch eaters stated that they threw away food because they did not like it. During preliminary discussions, some children had also commented that the meals were often served cold, but hot meals were not subsequently proposed as a way to reduce waste.

Participatory Research. No quantitative data relating to the participatory process were collected. Informal qualitative evaluation was undertaken, however. It revealed that the study had been very popular with the children. Being invited to participate in exploration of an issue that was clearly of immediate personal interest to them clearly excited their imagination and co-operation. The class teacher, who had played an active role in the process, felt that the students had learned a lot about scientific observation, co-operative rsearch, and responsibility towards their environment.

Conclusions

As an exploration of participatory research, the study was considered by both staff and students as highly successful. Participatory research with teenagers has previously been reported, but this was the first demonstration of the use of such methods with this younger age group. Future studies of this kind should be more carefully designed to includemore systematic evaluation of the methods used.

Data relating to food-waste measurement, and the students' proposals for reduction of waste, were presented to the other third-grade classes, to the parents at an open house, and subsequently to the headmaster and the PTA for discussion and further action.

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