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## Influence of School, Class, Ethnicity, and Gender on Agreement of Fourth Graders to Participate in a Nutrition Study

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### Abstract

This article describes the methods used to recruit fourth-grade children for a school-based study concerning the accuracy of their school breakfast and lunch recalls, and it reports the impact of school, class, ethnicity, and gender on agreement to participate. A total of 522 children (27% White Males [WM], 30% White Females [WF], 21% Black Males [BM], 22% Black Females [BF]) was available to recruit from 22 classes at six public schools in one district in a southeastern state during the 1999 - 2000 school year. Across classes, 45% to 95% of children agreed to participate (n = 376, 25% WM, 30% WF, 22% BM, 23% BF) with 72% overall. Logistic regression indicated class as a marginally significant predictor of participation ( $p < 0.04$ ), but failed to indicate school, ethnicity, or gender as significant predictors. Other specific factors that may influence children's participation need to be investigated and results shared to help improve recruitment efforts for future school-based studies.

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High participation rates in research studies help reduce sampling bias, especially for school-based research. Recruiting subjects for school-based research can prove challenging.<sup>1,4</sup> According to Harrington et al,<sup>1</sup> recruitment methods for school-based research need to be identified at four levels: district, school, teacher, and child. Approval must come from the school district superintendent, followed by school principals and teachers, and finally the children and their parents. Several articles discussed strategies for recruitment at the district,<sup>1,8</sup> school,<sup>1,11</sup> teacher,<sup>1,8,10,11</sup> parent,<sup>1,4,7,9,12</sup> and child<sup>1,4,7,12</sup> levels.

Though specific strategies are important for recruiting children, it is also important to consider what individual factors may influence a child's agreement to participate in a study. Before children may participate in most research studies, Human Assurance guidelines require that written child assent and parental consent be obtained. More information is needed about what influences child assent and parental consent, which could lead to improved participation rates for future studies.

Several articles considered factors that may affect a child's agreement to participate. Harrington et al<sup>1</sup> discussed recruitment issues from the *High 5 Alabama Project* in which 1,698 third-graders from 108 classes in 28 schools in three school districts agreed to participate. On a randomly selected subsample of African American and White children including 174 study participants and 152 nonparticipants from 26 schools. Harrington et al<sup>1</sup> found that children who were African American, eligible for free or reduced-cost lunch program, not on the honor roll, or frequently absent were significantly less likely to participate than their respective counterparts. They found no significant difference in participation in the study between males and females.<sup>1</sup>

Croft et al<sup>7</sup> discussed recruitment and participation in the *Bogalusa Heart Study* which was conducted from 1973-1974, 1976-1977, 1978-1979, and 1981-1982. During the first study year, children ranged in age from five to 14 years, but during the other three study years, children's ages ranged from five to 17 years. Croft et al<sup>7</sup> found that within each ethnicity and gender group, participation rates decreased in each successive study and generally decreased with increasing age. However, they also noticed that at all age levels, participation was higher among Black<sup>7</sup> children, especially Black girls; the lowest levels of participation came from White girls.

Atkins et al<sup>9</sup> discussed recruitment and participation in the *San Diego Family Health Project*. The project recruited Mexican American and Anglo fifth- and sixth-grade children. Overall, 26%<sup>9</sup> of the Anglo children and 46% of the Mexican American children agreed to participate.

Esbensen et al<sup>10</sup> presented findings from the *Gang Resistance Education and Training Program* with seventh-graders at two different sites. At the Torrance, Calif., site, four schools had agreed participation rates of 76%, 84%, 59%, and 72% of children.<sup>10</sup> At the Omaha site, four schools had agreed participation rates of 86%, 52%, 78%, and 85% of children for the first quarter, and 68%, 53%, 70%, and 70% for the second quarter, respectively.<sup>10</sup> Harrell et al,<sup>4</sup> Vaden et al,<sup>8</sup> and Belzer et al<sup>12</sup> discussed their recruitment procedures and stated their participation rates, but they did not discuss effects of specific factors such as school, class, ethnicity, and gender, on a child's agreement to participate. Puskar et al<sup>11</sup> discussed general issues and strategies for research in a school setting, but did not discuss effects of specific factors.

This article describes the methods used to recruit fourth-grade children for a school-based nutrition study, and reports the impact of school, class, ethnicity, and gender on agreement to participate. Data for the analysis were collected during the 1999-2000 school year for a study to determine accuracy and consistency of fourth-grade children's school breakfast and school lunch recalls validated with observations.<sup>13</sup> Children were recruited from schools because observations of children eating school meals provide a convenient and relatively unobtrusive means of validating children's dietary recalls.<sup>14,15</sup>

## METHODS

The institutional Human Assurance Committee (HAC) approved recruitment methods, data collection, and the child assent/parent consent forms. The child assent form was briefer and written in a language that was easier to understand, compared to the parent consent form.

The superintendent of one public school district in a southeastern state was contacted and permission was obtained to collect data at several elementary schools in the district, pending approval from the principal at each school. Principals at six schools were contacted and permission was obtained to recruit children from all 22 fourth-grade classes at the six elementary schools. Table 1 provides information concerning the total number and percent of

fourth-graders invited to participate, by school, ethnicity, and gender. Children of other ethnicities (n = 11) were excluded from analyses due to the small number. The six schools were chosen to obtain a final sample with equal numbers of Black [B], White [W], Male [M], and Female [F] children with high participation in school breakfast and school lunch. A total of 36%, 71%, 66%, 83%, 68%, and 91% of the children across all grades at Schools A, B, C, D, E, and F, respectively, was eligible to receive free or reduced-price school meals during the data collection period.

The recruitment procedure was similar at all six schools. Project personnel contacted each principal to schedule a brief meeting with the principal and all fourth-grade teachers at each school. Project personnel provided snacks at the meetings, after verbal permission was obtained from each school's principal. The main purpose of these meetings was to explain the study and gain the principals' and teachers' endorsement for data collection. After explaining the study, principals were told that their school would be allowed to keep a scale (used to weigh each participating child) at the end of the study. Teachers were given a form with pictures/ descriptions of six small prizes, and asked to rank their top three choices.

Teachers were told that two small prizes would be provided for each child who returned an assent/consent form signed by their parent regardless of whether assent/consent was granted or denied. Teachers chose whether they wanted these prizes revealed to the class during distribution of assent/consent forms, or when the signed assent/consent forms were collected. The small individual prizes (worth about \$.10 each) included pencils, pencil sharpeners, erasers, puzzle books, puzzle games, and tracing rulers.

Teachers also were told that near the end of the study they would be allowed to pick class prizes (worth about \$20 per class) such as sports equipment, games, and videos. Project personnel would distribute the class prizes at the end of the school year for the whole class to enjoy, along with a certificate of appreciation for each child who participated. Principals approved both the individual prizes and class prizes prior to distribution. At the end of the principal/teacher meetings, a day and time was scheduled for project personnel to visit each fourth-grade class to describe the study to the children, and to distribute the child assent and parent consent forms to be signed.

Class visits at each school were scheduled within approximately one week of the principal/teacher meeting and were scheduled only on Mondays, Tuesdays, or Wednesdays so that assent/consent forms could be due back to school on Thursday or Friday that same week. This procedure was followed because comments from teachers indicated more signed forms would be returned if children did not keep the forms over a weekend.

To decrease the amount of class time required for class visits, project personnel prepared one assent/consent form in advance for each child by filling in the child's name, teacher's name, and school. Using a protocol approved by the institutional HAC, project personnel (all White females) read the assent form to the class while children read along silently. After reading each paragraph, project personnel asked the children questions about what was read to make sure they understood. Project personnel encouraged the children to return the assent/consent forms, signed by both parent and child, by a specified due date (eg, two or three days later). Children were told that if they returned the signed forms by the specified date, they would each receive two small prizes regardless of whether agreement to participate was granted or denied.

To help teachers keep track of which children returned their signed assent/consent forms, each teacher received a chart for them to place a star sticker next to each child's name as the signed forms were returned. Project personnel returned to each classroom on the specified due date to collect returned forms and distribute the small prizes. Children who did not return signed forms by the due date and wanted another chance were allowed to pick one small prize each

which was kept by the teacher until the child returned the signed forms. Self-addressed, postage-paid envelopes were provided to teachers so they could mail to project personnel any additional signed forms that were brought back to school after the due date.

Agreement to participate indicated that 1) children would have their weight and height measured once at school, 2) randomly selected children would be observed while eating breakfast and lunch at school on some days, 3) randomly selected children would be interviewed up to three times at school regarding what they ate on the previous day and how much they liked what they ate, and 4) each child who was interviewed would be mailed a check for \$10 per interview. Agreement to participate was obtained when a child provided written assent and his/her parent or guardian provided written consent. If the child and/or parent said “no,” then the child was categorized as “actively denied.” Children who did not return signed assent/consent forms were categorized as “passively denied.”

Logistic regression was conducted to determine whether school, class, ethnicity, or gender were significant predictors of participation (agreed versus denied). Analyses were conducted using SAS, version 8. Results regarding the accuracy and consistency of the school breakfast and lunch recalls are reported elsewhere.<sup>13</sup>

## RESULTS

Of 522 children invited to participate, 376 children (72%) agreed. Information regarding the number and percent of fourth-grade children who agreed to participate of those invited, by school, ethnicity, and gender is reported in Table 2. The final sample of 376 children who agreed to participate consisted of 55% White and 45% Black, and 47% male and 53% female. The 376 children who agreed to participate included 25% WM, 30% WF, 22% BM, and 23% BF, which is similar to that of the total fourth-grade population at the six schools (27% WM, 30% WF, 21% BM, and 22% BF). This fact supports representativeness of the sample to the population. Across the six schools, agreement to participate ranged from 61% to 80% of children. Percentage of White children agreeing to participate at each school ranged from 57% to 81%, and percentage of Black children ranged from 70% to 83%.

Logistic regression indicated class as a significant predictor of participation ( $p < 0.04$ ), but failed to indicate school, ethnicity, or gender as significant predictors of participation (agreed versus denied). Table 3 shows the number and percent of children who agreed, actively denied, and passively denied to participate by school and class. Across the 22 classes, agreement to participate ranged from 45% to 95% of children. Agreed participation in some classes was different than other classes even within the same school.

## DISCUSSION

Class was the only “significant” predictor of participation in the logistic regression model. However, the p-value of just under 0.04 implies that the model for agreed participation using class as a factor would predict participation nearly as well as the model without class as a factor. Furthermore, it is unknown whether class is a proxy for teacher, peer influence, socioeconomic status (SES), educational achievement differences, or some other factor not measured or obtained for this study. In this analysis, school, ethnicity, and gender were not significant factors for predicting children's participation, and class only provided marginal improvement.

About two to three months after completing the first recruitment, but before data collection began, too few White males had agreed to participate in the study. Thus, with permission from the institutional HAC, a second invitation was given only to children who had not returned signed assent/consent forms in 11 of 12 classes at three of the six schools where there were additional White males. Signed forms already had been returned from every child in one of the

12 classes. Project personnel prepared a second assent/consent form for each of these children (n = 38) regardless of ethnicity or gender, and teachers were asked to distribute the forms to the specific children. Self-addressed, postage-paid envelopes were provided to teachers to return the signed assent/consent forms to project personnel after the children returned them from home.

The second invitation resulted in only five more children (3 WM, 1 BM, 1 BF) returning signed assent/consent forms. All five agreed to participate. Thirty-three children confirmed passive denial by not returning the second invitation assent/consent forms. At the same time the second invitation assent/consent forms were distributed, teachers also were given extra blank assent/consent forms for any new children who started at the three schools since the first invitation. Only one new child (BF) returned a signed assent/consent form and she agreed to participate. The addition of these six children (five from the second invitation and one new child) increased the agreed participation rate to 73% overall.

The 73% overall agreed participation rate is considered average for active consent. Written (active) consent has been shown to lower overall response rates.<sup>16,20</sup> Harrell et al<sup>4</sup> obtained consent from about 60% and 50% of children in elementary and middle schools, respectively, in their study. Baxter et al<sup>21</sup> obtained written consent from 64%, 61%, and 64% of fourth-graders in successive study years. Harrington et al<sup>1</sup> reported that 69% of third-graders agreed to participate in the *High 5 Alabama Project*. Vaden et al<sup>8</sup> reported that 80% of fifth-graders agreed to participate. The *Bogalusa Heart Study* had participation rates of 93%, 88%, 83%, and 80% for each of their successive studies.<sup>7</sup> Belzer et al<sup>12</sup> reported that 94% and 92% of fourth-graders agreed to participate in their 1989 and 1990 studies, respectively.

The result that agreement to participate did not differ by gender is similar to that reported by Harrington et al.<sup>1</sup> However, this analysis failed to indicate a significant difference in agreement to participate by ethnicity, which is in contrast to Harrington et al<sup>1</sup> who reported a significant difference (p = 0.011) between White and African American children's agreement to participate. The sampling schemes of this study were different than those of Harrington et al in that schools for this study were selected to achieve a final sample with equal numbers of Black, White, male, and female children with high participation in school breakfast and school lunch, while Harrington et al's sample was more representative of the larger area being sampled.

Some differences in agreed participation rates between school-based studies may be explained by considering the method of obtaining written consent for each study. For this study, project personnel visited each class to describe the study and distribute the assent/consent forms which is in contrast to studies that relied on teachers to describe the study and/or distribute the forms,<sup>1,7,8,10(p.745),12</sup> and those that sent packets with a description of the study and an assent/consent form directly home to the parents.<sup>4,9,10(p.745)</sup> In an attempt to receive additional written consent forms, the *Bogalusa Heart Study* gave letters and consent forms to nonrespondents two times, and after that they contacted parents of nonrespondents by telephone or home visits.<sup>7</sup> Belzer et al<sup>12</sup> provided a place on the consent forms for parents to request additional information about the study before granting or denying consent. However, Belzer et al<sup>12</sup> reported that had they not given parents the opportunity to request more information, agreed participation rates would have remained high at 89% and 90% for their 1989 and 1990 studies, respectively. For this study, the name and phone number of the principal investigator were provided on the consent forms; however, only two parents called with questions.

Another factor that could influence agreement to participate is incentives or rewards. This study provided children with a monetary reward of \$10 per interview. This incentive was not available in the earlier studies by Baxter et al<sup>21</sup> and could explain why participation rates

increased from 64% for Baxter's earlier similar studies in the same school district to this study's agreed participation rate of 73%.

Though the study was not designed to determine the impact on passive denial of showing the prizes when forms were distributed versus when they were collected, these results provide some insight. In all classes at Schools A, C, and E, teachers opted to wait until signed forms were collected to show prizes to the children in their classes; agreed participation rates at these three schools were 80%, 68%, and 75%, respectively. In all classes at Schools B and D, teachers opted to show the prizes when forms were distributed; agreed participation rates at these two schools were 61% and 71% respectively. At School F, two teachers opted to show the prizes when forms were collected, and one teacher wanted the prizes shown when the forms were distributed. The two highest percentages of passive denials per school were 25% at School B and 18% at School D, which is where children were shown the prizes when the forms were distributed, instead of when the signed forms were collected. Researchers may want to encourage teachers to delay showing children prizes earned for returning signed assent/consent forms until after the signed assent/consent forms are returned to help increase the percentage of signed forms that are returned and thereby decrease passive denial.

Agreed participation in some classes varied considerably within schools. As reported in Table 3, agreed participation in Classes 7, 9, 12, 15, and 17 was lowest and differed from classes within their respective school. Anecdotal evidence may provide some explanation as to why these participation rates were unusually low. In Class 7, the teacher was unexpectedly out of the classroom for most of the time when forms were distributed. The teacher from Class 9 was on extended leave, so a substitute was in the class when forms were distributed; project personnel noted that the rapport between the substitute and children seemed strained. In Class 12, the teacher began two months after school started and just prior to when the forms were distributed. In Class 15, project personnel noted that the teacher and children were unusually quiet when forms were distributed, perhaps indicating they were disinterested or just being respectful. The teacher from Class 17 missed the initial principal/teacher meeting. If possible, rescheduling the initial principal/teacher meeting and/or the distribution of the assent/consent forms may be beneficial if project personnel feel the class and/or teacher dynamics are poor, or if the teacher is absent during the originally scheduled time.

Distribution of the assent/consent forms for the second invitation and for the new children depended on the teachers. After project personnel provided forms to the teachers, it was up to the teachers to distribute the forms to the specified children, encourage the children to return the signed forms as soon as possible, then mail the signed forms to the project personnel. Some teachers may have decided not to distribute the forms to the children. Considering that only 13% (5 of 38) of children returned signed forms after the second invitation, this method does not appear to be worth the effort involved, though all five children agreed to participate. Thus, other methods are needed to decrease passive denial and possibly increase agreed participation.

Human assurance guidelines do not allow investigators to report characteristics of subjects who deny to participate except for observable characteristics obtained in a natural setting (ie, in which there are no stipulations on the subjects or changes to the environment). The analysis reported here was allowed because ethnicity and gender of children could be observed in each class. The key to this analysis was that the ethnicity and gender of children who denied to participate were generated by subtracting the number of children by ethnicity and gender of those who did agree to participate from the total numbers in each class.

There are several limitations to consider. This analysis included only six schools, which were not selected randomly, but because of high participation in school breakfast and school lunch. The small number of schools, lack of randomization of schools, and confounding of ethnicity

with school, may be why these factors were not significant predictors of participation. In addition, teachers were allowed to select when they wanted to show children the two prizes awarded for returning signed assent/consent forms. Randomly assigning this potential source of variability across schools would provide more insight on how this factor affects participation rates. This analysis did not include the impact of eligibility for free or reduced-price school meals at the child level, or the impact of the frequency of school absences at the child level. Under current HAC guidelines these factors are not observable and therefore cannot be used in analyses regarding children who deny participation. Though information was not collected regarding honor roll lists, this information could be used if it is publicly available for all children in all schools. Despite these limitations, the methods and results described provide insight into factors that affect children's agreement to participate in a nutrition study, which should be helpful to other researchers who collect data in elementary schools.

## CONCLUSION

School-based researchers are required to obtain child assent and parental consent before collecting data for most studies. Thus, more researchers need to report their strategies and experiences with recruitment and agreement to participate in school-based studies. This analysis indicated class as a marginally significant predictor of participation ( $p < 0.04$ ), but failed to indicate school, ethnicity, or gender as significant predictors. Anecdotal evidence suggests that teacher interest in the study is important in achieving higher participation rates. Other specific factors that may influence participation such as teachers, peer influence, honor roll, socioeconomic status, and amount and/or type of incentives need to be investigated and results shared to help improve recruitment efforts for future school-based studies.

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**Table 1**  
 Number and Percent of Fourth-Grade Children Invited to Participate, by School, Ethnicity, and Gender

	School A		School B		School C		School D		School E		School F		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Invited to Participate	127	-	76	-	88	-	73	-	83	-	75	-	522	-
Ethnicity														
White	100	79%	56	74%	67	76%	12	16%	43	52%	18	24%	296	57%
Black	27	21%	20	26%	21	24%	61	84%	40	48%	57	76%	226	43%
Gender														
Male	60	47%	37	49%	43	49%	34	47%	31	37%	44	59%	249	48%
Female	67	53%	39	51%	45	51%	39	53%	52	63%	31	41%	273	52%
Ethnicity / Gender														
White Males	44	35%	26	34%	34	39%	8	11%	13	16%	14	19%	139	27%
White Females	56	44%	30	40%	33	37%	4	5%	30	36%	4	5%	157	30%
Black Males	16	12%	11	14%	9	10%	26	36%	18	22%	30	40%	110	21%
Black Females	11	9%	9	12%	12	14%	35	48%	22	26%	27	36%	116	22%

**Table 2**  
 Number and Percent of Fourth-Grade Children Who Agreed to Participate of Those Invited, by School, Ethnicity, and Gender

	School A		School B		School C		School D		School E		School F		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Agreed to Participate	102	80%	46	61%	60	68%	52	71%	62	75%	54	72%	376	72%
Ethnicity														
White	81	81%	32	57%	43	64%	9	75%	29	67%	12	67%	206	70%
Black	21	78%	14	70%	17	81%	43	70%	33	83%	42	74%	170	75%
Gender														
Male	45	75%	20	54%	30	70%	27	79%	24	77%	30	68%	176	71%
Female	57	85%	26	67%	30	67%	25	64%	38	73%	24	77%	200	73%
Ethnicity / Gender														
White Males	33	75%	12	46%	23	68%	7	88%	9	69%	9	64%	93	67%
White Females	48	86%	20	67%	20	61%	2	50%	20	67%	3	75%	113	72%
Black Males	12	75%	8	73%	7	78%	20	77%	15	83%	21	70%	83	75%
Black Females	9	82%	6	67%	10	83%	23	66%	18	82%	21	78%	87	75%

**Table 3**

Number and Percent of Fourth-Grade Children Who Agreed to Participate,<sup>a</sup> Actively Denied to Participate,<sup>b</sup> and Passively Denied to Participate,<sup>c</sup> by School and Class

School	Class	Agreed to Participate		Actively Denied to Participate		Passively Denied to Participate		Total n
		n	%	n	%	n	%	
A	1	23	88%	2	8%	1	4%	26
	2	22	88%	3	12%	0	0%	25
	3	19	76%	2	8%	4	16%	25
	4	19	79%	3	13%	2	8%	24
	5	19	70%	6	22%	2	8%	27
	<b>Total</b>	<b>102</b>	<b>80%</b>	<b>16</b>	<b>13%</b>	<b>9</b>	<b>7%</b>	<b>127</b>
B	6	17	68%	2	8%	6	24%	25
	7	13	48%	3	11%	11	41%	27
	8	16	67%	6	25%	2	8%	24
	<b>Total</b>	<b>46</b>	<b>61%</b>	<b>11</b>	<b>14%</b>	<b>19</b>	<b>25%</b>	<b>76</b>
C	9	9	45%	9	45%	2	10%	20
	10	18	82%	2	9%	2	9%	22
	11	19	79%	4	17%	1	4%	24
	12	14	64%	4	18%	4	18%	22
	<b>Total</b>	<b>60</b>	<b>68%</b>	<b>19</b>	<b>22%</b>	<b>9</b>	<b>10%</b>	<b>88</b>
D	13	22	84%	2	8%	2	8%	26
	14	15	68%	2	9%	5	23%	22
	15	15	60%	4	16%	6	24%	25
	<b>Total</b>	<b>52</b>	<b>71%</b>	<b>8</b>	<b>11%</b>	<b>13</b>	<b>18%</b>	<b>73</b>
E	16	15	71%	6	29%	0	0%	21
	17	13	62%	6	29%	2	9%	21
	18	19	95%	1	5%	0	0%	20
	19	15	71%	4	19%	2	10%	21
	<b>Total</b>	<b>62</b>	<b>75%</b>	<b>17</b>	<b>20%</b>	<b>4</b>	<b>5%</b>	<b>83</b>
F	20	17	71%	6	25%	1	4%	24
	21	20	77%	2	8%	4	15%	26
	22	17	68%	3	12%	5	20%	25
	<b>Total</b>	<b>54</b>	<b>72%</b>	<b>11</b>	<b>15%</b>	<b>10</b>	<b>13%</b>	<b>75</b>
<b>Overall</b>		<b>376</b>	<b>72%</b>	<b>82</b>	<b>16%</b>	<b>64</b>	<b>12%</b>	<b>522</b>

<sup>a</sup>Children who agreed to participate returned signed child assent / parent consent forms which granted permission to participate.

<sup>b</sup>Children who actively denied to participate returned signed child assent / parent consent forms which denied permission to participate.

<sup>c</sup>Children who passively denied to participate did not return signed child assent / parent consent forms.