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Practice Notes: Strategies in Health Education

The Practice Notes section is intended to keep readers informed about health education practice around the country. It is an attempt to spread the word about exemplary strategies, initiatives, and programs and share successes in overcoming obstacles or challenges. Periodically, articles presenting perspectives on practice-related issues are also included in Practice Notes.

Program: Kids Count Farm Safety Lesson

Sponsor: The Deep-South Agricultural Health and Safety Center
(funded by the National Institute for Occupational Safety and Health)

Objectives

Agriculture plays a large role in the economy of Hillsborough County, Florida. In fact, Hillsborough County ranks third of all Florida counties in agricultural cash receipts. The Kids Count Lesson is designed to enable fifth-grade students in Hillsborough County, Florida, to describe farm-related injuries and ways to prevent them, including the types of protective gear that should be worn on a farm, and to recognize how “kids count” in farm safety.

Assessment of Needs

Agriculture is one of the most hazardous occupations in the United States, especially for children. A recent study in Florida showed that 20 children died on Florida farms between 1989 and 1998, and the leading cause of death was machinery. To decrease children’s agricultural injuries and deaths, several activities have been conducted, such as safety fairs and farm safety day camps. However, little to no education on agricultural safety has taken place in the school system. This led to the development of the Kids Count Farm Safety Lesson for fifth graders by the MORE HEALTH program and the Deep-South Agricultural Health and Safety Center.

Program Strategy

The 45-minute lesson is presented by the MORE HEALTH instructor to fifth-grade students and is accompanied by pre- and postlesson materials. The major topic areas include animal, machine, and water safety in addition to decreasing the effects of sun exposure, how to lift and pick crops, avoiding pesticides, and wearing protective gear. The North American Guidelines for Children’s Agricultural Tasks were greatly used in the development of the curriculum. The lesson proceeds with vivid visuals and props and having the children actively participate throughout the presentation. The development of this lesson was done in concert with the work of the Florida chapter of Farm Safety 4 Just Kids.
Emphasis was placed on the unique challenges of farming in Florida, including the work of migrant farm workers.

**Evaluation Approach**

The lesson’s content validity was assessed by experts in education, public health, and agricultural health and safety. Process evaluations included monitoring the number of children who received the lesson, the classroom teacher’s evaluation of the lesson, and the instructor’s fidelity to the lesson format. Impact evaluations are presently being conducted by comparing pretest and/or posttest results of children who received the lesson in 15 schools. Nearly 2,000 children have received the lesson to date.

**Implications for Practitioners**

Little to no information is found in the literature in reference to the development and evaluation of agricultural safety education programs in the school setting, especially settings in the south. In geographic areas where farming is common, schools can be an important conduit for this type of health education information. The development of this highly interactive curriculum for elementary students may be an important first step in decreasing children’s risky behaviors and ultimately agricultural injuries and deaths.

For more information about the Kids Count Lesson, contact Karen Pesce, RN of the MORE HEALTH program; e-mail: kpesce@tgh.org; or Dr. Karen Liller of the University of South Florida College of Public Health (site of the Deep-South Agricultural Health and Safety Center), 13201 Bruce B. Downs Blvd., Tampa, FL 33612; phone: (813) 974-6685; e-mail: kliller@hsc.usf.edu.

**Note:** This article was supported by Grant U07/CCU416005-03 from the National Institute for Occupational Safety and Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute for Occupational Safety and Health.

**References**


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**Program: Senior Seminar—Relationships: Friendship, Dating, and Beyond**

**Sponsor:** Jackson County Department of Public Health—Funding From the North Carolina Department of Health and Human Services—Adolescent Pregnancy Prevention Program

**Objectives**

The Senior Seminar is designed to provide 12th-grade students in Jackson County, North Carolina, with current, accurate information on the lifestyle choices they will face as they graduate from high school and begin the next phase of their lives, and to facilitate the development of skills to avoid risk behaviors among more mature teens.
Assessment of Need

In North Carolina, the Healthful Living curriculum guidelines mandate health instruction from Kindergarten through ninth grade. A breakdown of pregnancy rates by age, however, shows an increase in pregnancies in 16- and 17-year-olds, with a marked increase among 18- and 19-year-olds. These numbers reflect a national trend.* While many pregnancy prevention programs are geared for the younger teens, the data suggest the importance of both “starting early and staying late.” Reports from teachers and concerned parents suggest that some of the most academically capable students are dropping out of college, not because they are not prepared academically but because poor choices cause them to become involved in risk behaviors that derail their college careers.

Program Strategy

To address this need, a series of classes is conducted during the senior year of high school, using a seminar format, rather than lectures. The seminar focuses on a different topic each day with interactive activities, small group work, self-assessments, role-playing to practice communication skills, and expert guest speakers. A few short video segments are used. The seminar series includes eight 90-minute sessions. It is conducted during English classes because English is the only course required for all seniors. The health educator works closely with the senior English teachers to schedule the series. The teachers are present during all sessions and often become involved in discussions and make valuable contributions of information and/or real-life stories from past students. Sessions in order of presentation are as follows: Friendship, Communication, Dating, Substance Abuse, Unhealthy Relationships/Depression, Committed Relationships/Marriage, Intimate Sexual Behavior, and STDs/Contraception.

Evaluation Approach

The county is involved in a 5-year study by Philliber Research Associates that follows students’ sexual behaviors and attitudes from 7th grade through 12th grade. Students are individually tracked by ID number for the 5 years, completing surveys in 7th, 8th, 9th, 10th, and 12th grades. That survey is also administered before and after the 12th-grade seminar to determine changes in knowledge and attitudes, based on the seminar.

Implications for Practitioners

In statewide pregnancy prevention meetings and workshops, it is evident that school systems are not addressing healthy lifestyle choices in a comprehensive manner with 12th-grade students. This transitional year for students may be a critical period in their lifestyle choices. The students have approached the seminars with great seriousness, recognizing that the choices they are making now have lifelong implications. The experience is refreshing and very different from the challenge of convincing the more short-term focused 7th, 8th, and 9th graders that their choice concerning sexual behaviors this weekend matters. Seniors in high school appear to be more concerned about their personal responsibility in forming quality relationships. The support of the school system, administrators, and, most important, the teachers, in working with the Health Department have been critical in the success of this program.

For more information, please contact Gayle Woody, Health Education Specialist, Jackson County Department of Public Health, 538 Scotts Creek Road, Suite 100, Sylva, NC 28779; phone: (828) 586-8994, ext. 282; e-mail: gaylewoody@jacksonnc.org.

* CDC—Alan Guttmacher Institute; see also Jackson County pregnancy rates in Attachment 1.
Program: The Seat Pleasant–University of Maryland Health Partnership

Sponsor: University of Maryland, Department of Public and Community Health, College Park, Maryland

Objectives

The objectives of the Seat Pleasant–University of Maryland Partnership are twofold. First, to enhance student learning, the university seeks to provide a vehicle for service learning whereby students can apply the knowledge and skills learned on campus in the community. Second, to improve the health of city residents, the city of Seat Pleasant seeks to increase health education services to residents, services that they do not have the budget or the staff to provide.

Assessment of Need

Seat Pleasant is a city of 5,700 residents, 97% of which are African American, located in Southern Maryland just across the Northeast border of Washington, D.C. The city experiences the health-related issues prevalent in many inner cities. For example, there is high unemployment, significant drug abuse, violence, and poverty. As a result, Seat Pleasant is a grantee of State of Maryland HotSpot funding designed for communities with these challenges. In addition, graduate and undergraduate students at the University of Maryland Department of Public and Community Health conducted a community needs assessment, which included identification of the community’s assets. A more extensive needs assessment is currently under way.

Program Strategy

As a result of the needs assessment, department faculty worked with the city administrator toward a collaborative plan that would benefit both the city of Seat Pleasant and the university by allowing students the opportunity to plan, implement, and evaluate special projects aimed at improving the health and well-being of city residents. In 1998, a presentation was made before the city council and the mayor, after which a resolution was passed in support of a city-university partnership. A board of directors was appointed with city representatives (a youth, a senior citizen, an elementary school principal, a longtime city resident, clergy, etc.) and university representatives. The majority of voting board members are required to be city residents. Since its inception, the board has added faculty from the Department of Criminology, the College of Education, and a student recruitment person. The board meets monthly, determining which projects to sanction. An annual report is distributed to the city council, the mayor, and various administrators at the university. Student projects completed so far include a health fair, health screenings, a study of the children’s health insurance needs, an exhibit of the positive aspects of life in Seat Pleasant, and tutoring at an after-school center.

Evaluation Approach

A formative evaluation process consisted of focus groups and questionnaires mailed to city residents, the mayor, Health Partnership board of directors, administrators at the university, faculty, and students. In addition, each service-learning activity is required to have an evaluation protocol designed as part of the project.

Implications for Practitioners

Community-campus partnerships have the potential for both enhancing the educa-
tion of students and improving community health. A formal, ongoing collaboration, with the flexibility to conduct varying projects around a variety of issues, under the guidance of a regularly meeting board of directors can facilitate the implementation of a variety of unique and creative projects. The university has learned a great deal about how to best achieve the objectives for both the city and the students. First, it is important to identify clear goals and objectives of the partnership, without exaggerating what such a partnership can accomplish. Setting goals and expectations that are too lofty will result in a partnership perceived as ineffective. Second, as in all community health education efforts, it is critical to involve the community from the outset. Third, create a formal board that includes representation from various community and campus segments. The board can serve to provide continuing information about the community and university; provide oversight to assure that projects are focused on a specific community need and are appropriate for the community; and can be an invaluable vehicle for promoting the potential and, ultimately, the accomplishments of the partnership.

For further information, please contact Jerrold S. Greenberg, EdD, Department of Public and Community Health, Health and Human Performance Building, University of Maryland, College Park, MD 20742; phone: (301) 405-2524; e-mail: jg56@umail.umd.edu.

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**PRACTICE NOTES EDITORIAL COMMITTEE**

Lisa D. Lieberman, PhD, CHES, President, Healthy Concepts, and Evaluation Specialist, Inwood House Research Group, New York; and Barbara Hager, MPH, CHES, Director, Division of Health Education and Promotion, Arkansas Department of Health.

**SUBMISSION INFORMATION**

Abstracts for Practice Notes and all correspondence concerning abstract review should be sent to Lisa D. Lieberman, Healthy Concepts, 29 Ardsley Drive, New City, NY 10956. Submissions can be mailed (include one hard copy and disk in Word format or Word Perfect) or sent by e-mail attachment to llhealth@optonline.net in Word format. Published manuscript length is approximately 300 words (excluding headings and contact information). Submitted manuscripts may be up to 500 words and will be edited for length and clarity. Include the following: name of initiative or program, contact person, sponsoring agency or agencies, address, and phone number. The program description should include the following headings: Objectives, Assessment of Needs, Program Strategy (e.g., risk reduction, community organizing, media advocacy, disease management, policy advocacy, coalition building, social support, etc.), Evaluation Approach, and Implications for Practitioners (including descriptions of any special challenges or unique circumstances that the project has overcome). Authors should not include evaluation results because Practice Notes is intended to describe processes and programs, not to assess outcomes. Submissions will be judged on applicability and utility to the health education practitioner, clarity of objectives, innovativeness and creativity, existence of evaluation plan, and potential replicability. Additional artwork, graphs, or tables may be submitted in camera-ready form.
Intraclass Correlation for Measures From a Middle School Nutrition Intervention Study: Estimates, Correlates, and Applications

David M. Murray, PhD
Glenn A. Phillips, MA
Amanda S. Birnbaum, PhD, MPH
Leslie A. Lytle, PhD

This article presents the first estimates of school-level intraclass correlation for dietary measures based on data from the Teens Eating for Energy and Nutrition at School study. This study involves 3,878 seventh graders from 16 middle schools from Minneapolis–St. Paul, Minnesota. The sample was 66.8% White, 11.2% Black, and 7.0% Asian; 48.8% of the sample was female. Typical fruit and vegetable intake was assessed with a modified version of the Behavior Risk Factor Surveillance System questionnaire. Twenty-four-hour dietary recalls were conducted by nutritionists using the Minnesota Nutrition Data System. Mixed-model regression methods were used to estimate variance components for school and residual error, both before and after adjustment for demographic factors. School-level intraclass correlations were large enough, if ignored, to substantially inflate the Type I error rate in an analysis of treatment effects. The authors show how to use the estimates to determine sample size requirements for future studies.

Nutrition intervention studies directed toward youth often use designs in which classrooms or schools are assigned to conditions, while observations are taken on individual students. Such studies are examples of a broader class of comparative studies called group-randomized trials. Quite generally, a group-randomized trial is a study in which identifiable groups are assigned to conditions while observations are taken on members of those groups.1

Studies with different units of assignment and observation exist in many disciplines and pose a number of design and analytic problems absent when individuals are randomized to conditions.2 The most important is that observations taken from members of the same identifiable group are likely to be correlated.3 This intraclass correlation (ICC) reflects a component of variance attributable to the groups in addition to the usual variation attributable to the members. It also violates the independence-of-errors assumption associated with the most familiar analytic methods. Simulation studies have shown that any analysis that ignores the ICC will have an inflated Type I error rate.4–7 Moreover, the...
precision available to estimate the ICC is based on the often limited number of groups assigned to each condition. These factors can reduce power so that it may be difficult to detect important treatment effects.

Even so, the group-randomized trial remains the best comparative design available when investigators wish to evaluate an intervention implemented at a group level or one that cannot be delivered to individuals. The best advice is to plan a large enough study to allow for the expected ICC and to take advantage of other design and analytic strategies to limit its impact. To do so, investigators need good estimates of the ICC expected in their studies.2 Unfortunately, only two articles have reported estimates for measures of dietary intake, and both reported only community-level estimates for a limited number of measures. Feng et al.8 reported estimates for adults for five to six measures based on the Block food-frequency questionnaire9 and on the Kristal fat and fiber questionnaire;10 they reported estimates for adolescents based on three items on fruit and vegetable consumption. Gulliford et al.11 reported estimates for adults based on four items on fruit, vegetable, and salt consumption.

In this article, we present the first estimates of school-level ICCs for measures of dietary intake. We also present estimates for a much wider range of measures than have been reported previously. These estimates are based on fruit and vegetable assessments adapted from the Behavioral Risk Factor Surveillance System (BRFSS)12 and the 24-hour dietary recall.13 We also present estimates for variables related to dietary intake. More important, we show how regression adjustment for covariates can be used to reduce these ICCs. Finally, we show how to use these estimates to plan future school-based nutrition intervention studies.

**MATERIALS AND METHOD**

**Study Design and Population**

We used baseline data from the Teens Eating for Energy and Nutrition at School (TEENS) study. This is a school-based study to evaluate school, classroom, and family interventions to increase fruit and vegetable intake and decrease fat intake among low-income seventh and eighth graders. Participating school districts had to be located in the Twin Cities metropolitan area, have at least 20% of their students qualify for the free and reduced lunch program, have seventh and eighth graders in the same building, and have at least 30 students in each of those grades. Fourteen districts were eligible (33 schools), and 9 districts agreed to participate (20 schools). Reasons cited for not participating were time constraints, personnel changes, and lack of interest in the school food-environment component of the intervention. One school was chosen as a pilot school, and 3 were later excluded due to scheduling problems that would have limited the proportion of seventh and eighth graders exposed to the intervention.

Baseline surveys were conducted during the fall semester of 1998. All seventh graders were invited to complete the questionnaire. A random sample of seventh graders in each school was also invited to complete a 24-hour dietary recall. Parents received a passive informed consent letter in advance of the survey and students gave written consent at the time of the survey; these procedures were approved by the University of Minnesota Committee on the Use of Human Subjects in Research. Of the 4,050 seventh graders eligible for the survey, 95 (2.3%) were missed due to absence from school on two survey attempts, 77 (1.9%) were excluded due to parental or student refusal, and 3,878 (95.8%) completed
the survey. Of the 820 students selected for the 24-hour recall, 174 (21.3%) were missed due to absence or other scheduling problems, 6 (0.7%) were excluded due to parental or student refusal, and 640 (78.0%) completed the recall.

Variables of Interest and Their Measures

Typical fruit and vegetable intake was assessed with a modified version of the BRFSS. This version included six items on the frequency of consuming fruit juices, fruit (excluding fruit juices), green salad, potatoes (excluding french fries, fried potatoes, and potato chips), carrots, and vegetables (excluding carrots, potatoes, and salad) during the last year. The items were scored to estimate the average number of daily servings during the past year (see appendix). This method discriminates between students who eat five or more servings of fruits and vegetables a day and those who eat less than five servings a day, with moderate sensitivity (0.48) and good specificity (0.76).

The Nutrition Knowledge Scale was a reduced version of a 17-item scale previously tested with adolescents. This scale presented students with 10 pairs of foods and asked them to identify which food is “better for your health.” One food item in each pair was considered a healthier choice. The individual items were first coded so that higher scores reflected healthier choices and then summed to create a single scale. The reduced scale had excellent internal consistency (Cronbach’s alpha = .95).

Thirty-five items were based on the Theory of Reasoned Action; each item was presented in a five-category Likert-type scale format. The 7-item Valuation Scale included items such as “my health as an adult is very important to me” (Cronbach’s alpha = .83). The 7-item Perceived Outcomes Scale included items such as “the foods I eat affect how strong I am” (Cronbach’s alpha = .79). The 6-item Barriers to Healthy Eating Scale included items such as “healthy foods cost too much money” (Cronbach’s alpha = .73). The Subjective Norms Scale included 6 items such as “people who care about me think that I should eat more fruits” (Cronbach’s alpha = .79). The Current Behavior scale included 4 items such as “I think I eat enough fruit most days” (Cronbach’s alpha = .57).

Two items assessed physical activity. The first asked the student to indicate how often he or she was physically active for at least 20 minutes at a time; five categories ranged from most of the time to never. The second asked the student to think about how hard he or she breathed when he or she was physically active; four categories ranged from breathing much harder than usual to breathing the same as usual. These items were combined to form a scale from 0 to 9, where higher values represent greater physical activity (test-retest correlation = .71).

Four items assessed time spent in common sedentary activities. Two items measured hours per day spent watching TV, with five responses ranging from I don’t watch TV during the weekdays (weekend) to more than 4 hours per day. Two items measured hours per day spent playing video games, with the same answer categories. The four items were combined to form a scale from 4 to 20, where higher values represent more sedentary activity (Cronbach’s alpha = .81).

Past 30-day prevalence of purging was measured with a question from the Voice of Connecticut Youth Survey. Analysis was limited to women because purging is so rare among men. Three purging items were the following: “Made yourself vomit (throw up),” “took diet pills (like Dexatrim),” and “took laxatives or diuretics (like Ex-Lax or water
pills).” Students marking any of those items were categorized as purgers. The stability of the purging measure was lower than for other scales (test-retest Kappa = .30), likely because it was so rare (< 2%).

Nutritionists conducted 24-hour recalls using laptop computers and the Minnesota Nutrition Data System (NDS version 2.6/8a/23, Nutrition Coordinating Center, University of Minnesota). Interviewers were trained on the use of the software, interviewing techniques, and the study-specific protocol for data-entry rules. Each interviewer was certified, and quality control checks were made during the survey. The NDS was chosen because of its use of direct data entry, its interactive and standardized probes for collecting details of food intake, the quality of the nutrient database, and the inclusion of more than 10,000 brand-specific items in the database.

Eligible students were selected at random from each classroom for the 24-hour recalls, with sampling proportional to class size. Dietary recalls were conducted Monday through Thursday, and students who were absent were interviewed later in the week if possible. Approximately 30 and 50 students were measured in control and intervention schools, respectively. All interviews were conducted individually in a quiet location. Students were asked to report all types and amounts of foods and beverages they consumed on the previous day. Food models and other portion-size prompts were available, and each interview took between 15 and 30 minutes.

### Analysis Method

We fit two models for each dependent variable. In Model 1, we included school as the only independent variable, specifying it as a random effect. Model 1 provided estimates of the crude ICC and residual error variance. In Model 2, we added age (years), gender (1 = female, 0 = male), race/ethnicity (1 = White, 2 = Black, 3 = Hispanic, 4 = Asian, 5 = Native American, 6 = other), number of parents the student reported living with (1 = two, 0 = other), and whether the student received a free or reduced lunch (1 = yes, 0 = no), specifying these variables as fixed effects. Model 2 provided estimates of ICC and residual error variance after removing variation attributable to the demographic variables.

Neither model included terms to represent the student’s classroom or school district, although both might be viewed as additional levels of nesting in the data structure. One reviewer questioned this approach, suggesting that all levels of nesting should be reflected in the analysis. We rejected this suggestion because our goal was to estimate the components of variance that affect the evaluation of the intervention effect in a group-randomized trial. To do that, we need to model only those levels that contribute to the variation of the condition means; in the nested cross-sectional design employed in TEENS, those levels are the units of observation and randomization, respectively. The randomization of schools provides the basis for the assumption that errors associated with schools are independent, so that higher levels of aggregation can be ignored with no adverse effect on the Type I error rate. A previous simulation study confirmed that intermediate levels of nesting (here, classes within schools) can also be ignored because any variation due to those intermediate levels is automatically part of the variation estimated for schools.

For dependent variables for which it was reasonable to assume normally distributed residual errors, we conducted the analyses using SAS PROC MIXED, version 6.12. MIXED implements the general linear mixed model and is appropriate when there are multiple random effects that are distributed normally. For other dependent variables, we conducted the analyses using the GLIMMIX macro. The macro implements the gener-
alized linear mixed model\(^{26,27}\) and is appropriate when there are multiple random effects and the residual error is not distributed normally. For dichotomous variables, we specified a binomial distribution for the residual error and a logit link to obtain a mixed-model logistic regression analysis. For count variables, we specified a Poisson distribution for the residual error and a log link to obtain a mixed-model Poisson regression analysis. For the 24-hour recall variables, we excluded cases more than four standard deviations from the mean.

MIXED and GLIMMIX provided estimates of the variance attributable to schools and to residual error; estimates from GLIMMIX were returned to the original scale using the inverse link function.\(^1\) We used these estimates to compute the ICC as the proportion of the total error variance attributable to the school. We computed confidence bounds based on the upper and lower 95% critical values for the \(F\)-distribution and the available degrees of freedom \((df)\).\(^{28}\) The ICC and residual error variance estimates from Model 2 were compared with those from Model 1 to compute the percentage change obtained from the adjustments applied in Model 2 (percentage change = ((Model 2)/Model 1)•100).

### Results

Consistent with the demographic profile of the Twin Cities, one-third of the sample consisted of students of color (Table 1). Nearly one-third lived with just one parent, and nearly one-quarter participated in the free and reduced-price lunch program.

Table 2 provides the first estimates of school-level ICs for daily servings of fruits and vegetables based on the modified BRFSS (items 1-3) and for dietary intake based on the 24-hour recall (items 4-17). The average intraclass correlation was .026, and most correlations fell between .005 and .05. Most of these measures evidenced reductions in the ICC and residual error with regression adjustment for demographic variables. The average ICC for the dietary intake measures declined by 53.9%, while more modest declines obtained for residual error. A few variables evidenced large relative increases in ICCs.

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<th>Variable</th>
<th>Level</th>
<th>Frequency</th>
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<td>0.381</td>
<td>10.9-14.9</td>
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(\text{continued on pg. 673})
Table 2. Point Estimates, ICCs, and Their 95% Upper and Lower Confidence Bounds, and Residual Error Estimates for Models 1 and 2

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<th>Item</th>
<th>Variable</th>
<th>Parameter</th>
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<th>Model 2 $^b$</th>
<th>Model 2 vs. 1</th>
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<td>1</td>
<td>Servings of fruit</td>
<td>LCB</td>
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<td>0.00054</td>
<td>–75.96%</td>
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<td>Mean: 2.482</td>
<td>ICC</td>
<td>0.02179</td>
<td>0.00524</td>
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<td></td>
<td>UCB</td>
<td>0.05711</td>
<td>0.01939</td>
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<td></td>
<td></td>
<td>Res</td>
<td>4.40351</td>
<td>4.29109</td>
<td>–2.55%</td>
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<td></td>
<td>Mean: 2.016</td>
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<td>0.00973</td>
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<td></td>
<td>UCB</td>
<td>0.06838</td>
<td>0.02991</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>4.77473</td>
<td>4.51955</td>
<td>–2.55%</td>
</tr>
<tr>
<td>3</td>
<td>Servings of fruit and vegetables</td>
<td>LCB</td>
<td>0.01633</td>
<td>0.00360</td>
<td>–2.55%</td>
</tr>
<tr>
<td></td>
<td>Mean: 4.504</td>
<td>ICC</td>
<td>0.03359</td>
<td>0.01078</td>
<td>–67.92%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.08296</td>
<td>0.03217</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Calories</td>
<td>LCB</td>
<td>-0.00557</td>
<td>-0.00747</td>
<td>–9.70%</td>
</tr>
<tr>
<td></td>
<td>Mean: 2,113 kcal</td>
<td>ICC</td>
<td>0.01220</td>
<td>0.00878</td>
<td>–27.97%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.06280</td>
<td>0.05537</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>6.147E+05</td>
<td>5.551E+05</td>
<td>–10.12%</td>
</tr>
<tr>
<td>5</td>
<td>Fat</td>
<td>LCB</td>
<td>-0.01158</td>
<td>-0.00925</td>
<td>–3.42%</td>
</tr>
<tr>
<td></td>
<td>Mean: 73.56 g</td>
<td>ICC</td>
<td>0.00212</td>
<td>0.00631</td>
<td>197.86%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.04178</td>
<td>0.05105</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>1.286E+03</td>
<td>1.156E+03</td>
<td>–10.12%</td>
</tr>
<tr>
<td>6</td>
<td>Cholesterol</td>
<td>LCB</td>
<td>-0.01957</td>
<td>-0.02178</td>
<td>–3.42%</td>
</tr>
<tr>
<td></td>
<td>Mean: 204.6 mg/dl</td>
<td>ICC</td>
<td>-0.01321</td>
<td>-0.01726</td>
<td>30.66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.00576</td>
<td>-0.00369</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>2.186E+04</td>
<td>2.111E+04</td>
<td>–3.42%</td>
</tr>
<tr>
<td>7</td>
<td>Saturated fat</td>
<td>LCB</td>
<td>-0.01008</td>
<td>-0.01215</td>
<td>–77.55%</td>
</tr>
<tr>
<td></td>
<td>Mean: 27.38 g</td>
<td>ICC</td>
<td>0.00483</td>
<td>0.00108</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.04779</td>
<td>0.03948</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>211.740</td>
<td>193.500</td>
<td>–8.61%</td>
</tr>
<tr>
<td>8</td>
<td>Fiber</td>
<td>LCB</td>
<td>0.00706</td>
<td>-0.00157</td>
<td>–44.09%</td>
</tr>
<tr>
<td></td>
<td>Mean: 13.22 mg</td>
<td>ICC</td>
<td>0.03457</td>
<td>0.01933</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.10994</td>
<td>0.07812</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>36.929</td>
<td>35.511</td>
<td>–3.84%</td>
</tr>
<tr>
<td>9</td>
<td>Vitamin A</td>
<td>LCB</td>
<td>0.00082</td>
<td>-0.00650</td>
<td>–47.25%</td>
</tr>
<tr>
<td></td>
<td>Mean: 5,337 units</td>
<td>ICC</td>
<td>0.02744</td>
<td>0.01448</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.10064</td>
<td>0.07345</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>1.915E+07</td>
<td>1.898E+07</td>
<td>–0.90%</td>
</tr>
<tr>
<td>10</td>
<td>Vitamin D</td>
<td>LCB</td>
<td>0.04100</td>
<td>0.01336</td>
<td>–3.84%</td>
</tr>
<tr>
<td></td>
<td>Mean: 7.449 units</td>
<td>ICC</td>
<td>0.09234</td>
<td>0.04538</td>
<td>–50.86%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.21999</td>
<td>0.13155</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>20.855</td>
<td>19.773</td>
<td>–5.19%</td>
</tr>
<tr>
<td>11</td>
<td>Vitamin C</td>
<td>LCB</td>
<td>-0.00420</td>
<td>-0.01033</td>
<td>–50.86%</td>
</tr>
<tr>
<td></td>
<td>Mean: 110.9 units</td>
<td>ICC</td>
<td>0.01464</td>
<td>0.00363</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.06808</td>
<td>0.04402</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>6.726E+03</td>
<td>6.740E+03</td>
<td>0.21%</td>
</tr>
<tr>
<td>12</td>
<td>Folate</td>
<td>LCB</td>
<td>0.01350</td>
<td>0.00490</td>
<td>–32.29%</td>
</tr>
<tr>
<td></td>
<td>Mean: 277.6 units</td>
<td>ICC</td>
<td>0.04646</td>
<td>0.03145</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.13480</td>
<td>0.10447</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>2.272E+04</td>
<td>2.130E+04</td>
<td>–6.24%</td>
</tr>
</tbody>
</table>

(continued)
Table 2. Continued

<table>
<thead>
<tr>
<th>Item</th>
<th>Variable</th>
<th>Parameter</th>
<th>Model 1(^a)</th>
<th>Model 2(^b)</th>
<th>Model 2 vs. 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Calcium</td>
<td>LCB</td>
<td>0.05451</td>
<td>0.01634</td>
<td>−55.89%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ICC</td>
<td>0.11452</td>
<td>0.05052</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.25841</td>
<td>0.14168</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>3.479E+05</td>
<td>3.293E+05</td>
<td>−5.35%</td>
</tr>
<tr>
<td>14</td>
<td>Iron</td>
<td>LCB</td>
<td>−0.00489</td>
<td>−0.00643</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ICC</td>
<td>0.01341</td>
<td>0.01065</td>
<td>−20.57%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.06542</td>
<td>0.05944</td>
<td></td>
</tr>
<tr>
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<td>Sodium</td>
<td>LCB</td>
<td>−0.01608</td>
<td>−0.01806</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>ICC</td>
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<td>−0.00654</td>
<td>122.42%</td>
</tr>
<tr>
<td></td>
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<td>UCB</td>
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<td>0.02709</td>
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<tr>
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<td>Res</td>
<td>5.4099</td>
<td>5.2418</td>
<td>−3.83%</td>
</tr>
<tr>
<td>16</td>
<td>Percentage of calories from fat</td>
<td>LCB</td>
<td>−0.00517</td>
<td>−0.00564</td>
<td>−5.59%</td>
</tr>
<tr>
<td></td>
<td>Mean: 30.78%</td>
<td>ICC</td>
<td>0.01265</td>
<td>0.01181</td>
<td>−6.68%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.06340</td>
<td>0.06157</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Percentage of calories from saturated fat</td>
<td>LCB</td>
<td>−0.01012</td>
<td>−0.01264</td>
<td>−99.02%</td>
</tr>
<tr>
<td></td>
<td>Mean: 11.45%</td>
<td>ICC</td>
<td>0.00460</td>
<td>0.00004</td>
<td>−3.24%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.04702</td>
<td>0.03691</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>1.550</td>
<td>1.111</td>
<td>−3.83%</td>
</tr>
<tr>
<td>18</td>
<td>Nutrition knowledge</td>
<td>LCB</td>
<td>0.02108</td>
<td>0.00292</td>
<td>−3.24%</td>
</tr>
<tr>
<td></td>
<td>Mean: 17.68</td>
<td>ICC</td>
<td>0.04200</td>
<td>0.00959</td>
<td>−77.16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.10098</td>
<td>0.02951</td>
<td></td>
</tr>
<tr>
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<td></td>
<td>Res</td>
<td>16.677</td>
<td>10.296</td>
<td>−3.24%</td>
</tr>
<tr>
<td>19</td>
<td>Valuation</td>
<td>LCB</td>
<td>0.00374</td>
<td>0.00316</td>
<td>−3.24%</td>
</tr>
<tr>
<td></td>
<td>Mean: 28.72</td>
<td>ICC</td>
<td>0.01128</td>
<td>0.01022</td>
<td>−9.40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.03371</td>
<td>0.03128</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>23.871</td>
<td>23.730</td>
<td>−0.59%</td>
</tr>
<tr>
<td>20</td>
<td>Outcomes</td>
<td>LCB</td>
<td>0.02502</td>
<td>0.01483</td>
<td>−36.49%</td>
</tr>
<tr>
<td></td>
<td>Mean: 25.56</td>
<td>ICC</td>
<td>0.04920</td>
<td>0.03124</td>
<td>−36.49%</td>
</tr>
<tr>
<td></td>
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<td>UCB</td>
<td>0.11642</td>
<td>0.07835</td>
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</tr>
<tr>
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<td>Res</td>
<td>40.140</td>
<td>38.974</td>
<td>−2.91%</td>
</tr>
<tr>
<td>21</td>
<td>Barriers</td>
<td>LCB</td>
<td>0.00290</td>
<td>0.00236</td>
<td>−10.02%</td>
</tr>
<tr>
<td></td>
<td>Mean: 23.20</td>
<td>ICC</td>
<td>0.00977</td>
<td>0.00879</td>
<td>−10.02%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.03025</td>
<td>0.02800</td>
<td></td>
</tr>
<tr>
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<td>Res</td>
<td>19.507</td>
<td>19.245</td>
<td>−1.34%</td>
</tr>
<tr>
<td>22</td>
<td>Subjective norms</td>
<td>LCB</td>
<td>0.00492</td>
<td>0.00269</td>
<td>−30.32%</td>
</tr>
<tr>
<td></td>
<td>Mean: 19.07</td>
<td>ICC</td>
<td>0.01331</td>
<td>0.00928</td>
<td>−30.32%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.03821</td>
<td>0.02896</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>28.689</td>
<td>28.503</td>
<td>−0.59%</td>
</tr>
<tr>
<td>23</td>
<td>Current behavior</td>
<td>LCB</td>
<td>0.00258</td>
<td>0.00166</td>
<td>−0.65%</td>
</tr>
<tr>
<td></td>
<td>Mean: 13.06</td>
<td>ICC</td>
<td>0.00910</td>
<td>0.00742</td>
<td>−18.44%</td>
</tr>
<tr>
<td></td>
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<td>UCB</td>
<td>0.02588</td>
<td>0.02471</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>10.190</td>
<td>10.140</td>
<td>−0.50%</td>
</tr>
<tr>
<td>24</td>
<td>Intend to eat more vegetables</td>
<td>LCB</td>
<td>0.00023</td>
<td>0.00052</td>
<td>−50.02%</td>
</tr>
<tr>
<td></td>
<td>Mean: 3.073</td>
<td>ICC</td>
<td>0.00461</td>
<td>0.00515</td>
<td>11.66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>UCB</td>
<td>0.01783</td>
<td>0.01908</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Res</td>
<td>1.473</td>
<td>1.461</td>
<td>−0.81%</td>
</tr>
</tbody>
</table>
with the regression adjustments, but only variables that had very small crude ICCs, so that the absolute increases were quite small.

The Model 1 ICCs for the variables based on the Theory of Reasoned Action averaged .014. Adjustment for covariates reduced the average ICC by 35.6%. The Model 1 ICC for the physical activity and sedentary-behavior measures were larger, averaging .032; the average declined by 65.1% with regression adjustment.

**DISCUSSION**

In general, the Model 1 ICC values for the dietary measures were similar to those reported for other adolescent health behaviors measured in school-based surveys.8,29-33 These studies have typically reported school-level ICCs in the range of .005-.05.
Investigators may be inclined to discount ICCs of this magnitude. However, that would be a dangerous step under conditions common in the field. This is best seen by understanding how the ICC interacts with the number of observations per school ($n$) to affect the variance of the intervention effect. The terms design effect (DEFF) and variance inflation factor (VIF) have been offered for this expression, which reflects the joint effect of the ICC and $m$:

$$\text{DEFF or VIF} = 1 + (m - 1)ICC.$$ 

As $m$ or ICC increases, DEFF or VIF increases. For example, even if the ICC is only 0.026, if 100 students are observed in each school, then DEFF or VIF will be 3.57. This means that the variance of the intervention effect will be 3.57 times as large in a school-randomized trial than if students had been randomized as individuals to study conditions. Failure to account for that extra variation will result in standard errors that are too small; test statistics that are too large; and quite likely, inferences that are not fully warranted by the evidence. The prudent course is to estimate in advance how much extra variation is expected in the study and to plan a large enough trial to accommodate it.

**APPLICATION**

To show how to do that, we will “redesign” the study from which these estimates were derived. As noted earlier, TEENS is an ongoing school-based study to evaluate school, classroom, and family interventions aimed at increasing fruit and vegetable intake and decreasing the fat intake of seventh and eighth graders to reduce their future risk of cancer. Murray reviewed methods to estimate sample size and power for those analyses, and TEENS was planned based on those methods. However, TEENS was planned based on unpublished estimates of ICC and residual variation from the CATCH study because those were the best estimates available. In this “redesign,” we will simply repeat the planning process, using the estimates presented in Table 2.

The intervention effects in TEENS will be assessed via a mixed-model analysis of covariance (ANCOVA). Fixed effects will include the study condition, the baseline value on the dependent variable, and other covariates that may improve precision or limit confounding. Murray provides the detectable difference formula for this analysis in Equation 9.7:

$$\hat{\delta} = \sqrt{\frac{2((\hat{\sigma}_m^2 + \hat{\theta}_m) + m\sigma_g^2 \hat{\theta}_g)(t_{\text{critical,1}.2} + t_{\text{critical,1}.2})^2}{mg}}.$$ 

Here, $\hat{\sigma}_m^2$ is the estimate of the residual error variance, unadjusted for any fixed-effect covariates, as we have reported for Model 1. The term $\hat{\theta}_m$ reflects the effect of the regression adjustment for covariates on the residual error variance, so that the product $\hat{\sigma}_m^2 \hat{\theta}_m$ is the adjusted residual error variance, as we have reported for Model 2. The term $m$ reflects the number of members per group, here the mean number of students per school. The term $g$ reflects the number of groups per condition, here schools per condition. The term $\hat{\sigma}_g^2$ is the estimated group variance, unadjusted for any fixed-effect covariates, as we have reported indirectly for Model 1. The two components of variance sum to equal the total variation in the dependent variable, $\hat{\sigma}_y^2 = \hat{\sigma}_e^2 + \hat{\sigma}_g^2$; they are related to the ICC as:
ICC = \frac{\hat{\sigma}^2_g}{\hat{\sigma}^2_g + \hat{\sigma}^2_m} \quad \text{so that} \quad \hat{\sigma}^2_g = \frac{\hat{\sigma}^2_g I \hat{CC}}{1 - I \hat{CC}}.

The term \( \hat{\theta}_g \) reflects the effect of the regression adjustment on the group variance, so that the product \( \hat{\sigma}^2_g \hat{\theta}_g \) is the adjusted group variance. The \( t \)-values reflect the Type I and II error rates established for the study. To calculate the detectable difference for the TEENS study, we need estimates for the adjusted and unadjusted variance components for the dependent variables of interest.

We will use servings of fruits and vegetables to illustrate these calculations. From Table 2, the unadjusted residual error variance and ICC for servings of fruits and vegetables are 14.078 and 0.03359 respectively, while the adjusted values are 13.487 and 0.01078. TEENS was planned with a two-tailed Type I error rate of 5% and power of 80%. Let \( g \) be 8 initially, as that is the number of schools per condition in the study; the degrees of freedom for the test of the intervention effect are based on the number of schools in each condition, \( df = 2(g - 1) = 14 \). Three thousand eight hundred and seventy-eight students provided survey data at baseline, and we will allow an attrition rate of 15% at the 2-year follow-up, providing 206 students on average in each school (\( m = 206 \)). The \( t \)-values for the Type I and II error rates are 2.145 and 0.868. We estimate the group component of variance as

\[
\hat{\sigma}^2_g = \frac{\hat{\sigma}^2_g I \hat{CC}}{1 - I \hat{CC}} = \frac{14.078 \times 0.03359}{1 - 0.03359} = 0.4893.
\]

Using Murray’s Equation 9.77 and the unadjusted variance estimates,

\[
\hat{\Delta} = \sqrt{\frac{2(14.078 + 206 \times 0.4893)(2.145 + 0.8681)^2}{206 \times 8}} = 1.12
\]

This means that with the actual size of the study, there is 80% power given a two-tailed Type I error rate of 5% to detect an intervention effect of 1.12 servings of fruits and vegetables, if we conduct an unadjusted analysis.

If we work from the adjusted components of variance and repeat the calculations, the detectable difference is

\[
\hat{\sigma}^2_g = \frac{\hat{\sigma}^2_g I \hat{CC}}{1 - I \hat{CC}} = \frac{13.487 \times 0.01078}{1 - 0.01078} = 0.1470
\]

\[
\hat{\Delta} = \sqrt{\frac{2(13.487 + 206 \times 0.1470)(2.145 + 0.8681)^2}{206 \times 8}} = 0.694.
\]

With the reduction in the ICC and residual error variance that are available with regression adjustment for these demographic variables, the study will have 80% power to detect a much smaller effect: 0.694 servings. That is a substantial improvement with no additional cost to the study beyond anticipating which covariates might be useful and measuring them as part of the baseline survey. It is also likely a conservative estimate, as it was based on cross-sectional data. In the final TEENS analysis, we will analyze the posttest
fruit and vegetable score, adjusting for the baseline fruit and vegetable score. The reduction in variance is likely to be greater and the detectable difference smaller.

It is important to note that while regression adjustment was helpful for this variable, it provides neither a uniform nor a complete solution to what is often termed the unit of analysis problem. The effect of the regression adjustment for covariates varied considerably across the variables reported in Table 2: While the magnitude of the adjusted ICC was smaller in most cases, it was larger in others and certainly not uniform. So while we recommend that investigators consider regression adjustment, they must do so in the context of the particular variables that will serve as their primary endpoints. Investigators must also recognize that even if the regression adjustment reduces their ICC substantially, the degrees of freedom for the test of the intervention still depend on the number of schools in the study, so that the critical t-values are unaffected by the regression adjustment. As such, regression adjustment may be useful in dealing with the first of Cornfield’s two penalties associated with group randomization (i.e., extra variation), but it will not deal with the second (i.e., degrees of freedom). It is also important to remind investigators that regression adjustment must always be employed within the context of an analysis method expected to have the nominal Type I error rate across conditions commonly found in group-randomized trials.

Investigators planning future studies can use the estimates in Table 2 to calculate Δ as a function of several different values for m and g, adjusting the degrees of freedom and t-values accordingly. They can then identify the combination of g and m that will provide adequate power for the detectable difference that they desire in their study. That difference will be detectable under several different combinations of m and g, and the investigators can choose the combination based on the relative cost of recruiting and retaining schools and students.

**IMPLICATIONS FOR PRACTICE**

Our findings have several implications for the evaluation of school-based nutrition intervention studies. They indicate, for example, that measures commonly used to evaluate school-based nutrition intervention studies may display the same kind of intraclass correlation observed for other health behaviors such as smoking and drug use. They indicate that these correlations must be taken into account in planning the evaluation to avoid a study that is too small if it is analyzed correctly. They indicate that these correlations must be taken into account in the analysis of the study findings to avoid misrepresenting the true effect of the intervention. They indicate that a partial solution to the problem of intraclass correlation may be available in the form of regression adjustment for covariates measured at the individual or group level. And because these issues and their solutions go beyond what is provided in the usual training for practitioners, they also suggest that consultation with methodologists who are familiar with these issues should be part of the planning process for any new effort to evaluate a school-based nutrition intervention project.

**SUMMARY AND CONCLUSIONS**

Intervention trials that employ a group-randomized trial design require an adaptation of the usual analytic methods to account for the randomization of identifiable groups to
study conditions and the positive ICC that is inherent in such a design. In the absence of valid estimates of the ICCs for the dependent variables of interest, investigators designing trials could only guess at how large a problem they faced and how much they would need to increase sample size to compensate. This article provides the first school-based estimates of ICC for daily servings of fruits and vegetables based on the modified BRFSS items and for dietary intake measures based on the 24-hour recall and NDS scoring system. Investigators need access to such information if they are to plan future school-based intervention studies so as to allow for the extra variation attributable to schools. Increasingly, National Institutes of Health (NIH) study sections are attending to this issue, as are journals, so that it is increasingly difficult to obtain NIH funding or to publish results if the study has not adequately dealt with the extra variation expected in a group-randomized trial.

The results presented here suggest that school-level ICCs for a variety of dietary measures are large enough to cause serious problems if ignored. The results also suggest that these ICCs can be reduced by adjustment for individual-level characteristics. We have demonstrated how information about these ICCs can be incorporated in sample size calculations to avoid underpowered studies. Our results will assist investigators in planning studies to evaluate the effectiveness of school-based nutrition intervention programs.

APPENDIX

Weights were assigned to self-reports of less than one serving per day, scaled in servings per day.

- 1-3 times per month = 0.07 (times per day) = (2 ×s/month)/(30.4 days/month)
- 1-2 times per week = 0.21 (times per day) = (1.5 ×s/week)/(7 days/week)
- 3-4 times per week = 0.50 (times per day) = (3.5 ×s/week)/(7 days/week)
- 5-6 times per week = 0.79 (times per day) = (5.5 ×s/week)/(7 days/week)

1 time per day = 1
2 times per day = 2
3 times per day = 3
4 times per day = 4
5 times per day = 5

References


Designing Health Information Delivery Systems for Puerto Rican Women

Ruth E. Davis, DEd, RNC, CRNP, NP-C
Daniele D. Flannery, PhD

Although health information is important to the prevention of much illness, the health information needs of Puerto Rican women remain unaddressed, according to the results of this phenomenological study. Through audiotaped interviews, 21 women evaluated various sources of health information. Analysis of the data revealed which health information sources they considered trustworthy and nontrustworthy. Health care providers were found to be one of the least helpful sources, as personal interactions were often hurried and inattentive to women’s needs. Yet, the women were able to present a vivid portrait of a culturally sensitive community environment conducive to the presentation of health information. Implications include the importance of including cultural values in any health information setting, as well as the importance of building cultural bridges between health educators and Puerto Rican women. More research is needed to examine community efforts to enhance health information sources for this population of women.

By the year 2050, minority groups are projected to account for almost half of all Americans.1 Latinos will be the largest minority group by the year 2009,2 and, as such, Latinos are among the fastest growing groups in the United States.3 Of these, the Puerto Rican population grew at four times the rate of the rest of the country and is considered the second-largest Latino group.3 The majority of Puerto Ricans reside in the northeastern United States.4

As with other minority groups, Puerto Ricans suffer from more consequences of poor health than Euro-American, non-Hispanic groups.3 Alcoholism, alcohol-related liver disease, lung disease, HIV/AIDS, and a variety of cancers are major causes of morbidity and mortality for those of Puerto Rican ethnicity.5-6 Puerto Rican women are more likely to develop breast cancer and cervical cancer than other women in the United States.7 But almost all of the contributors to poor health status, such as HIV/AIDS, heart disease, and cancers, are amenable to prevention strategies, particularly those available through health education efforts. Yet, Puerto Ricans as a group often encounter a number of disadvantages in health care settings. These include lack of private health insurance, quality health care, consideration of ethnic identity factors, and emphasis on health information.8,9

The literature concerned with the health needs of Puerto Rican women shows that much of the information used in everyday life to promote health and well-being is deeply imbedded in the culture.10 Culture is a set of behaviors and values shared by members of the same group.11 The Puerto Rican culture is rich with values that define everyday inter-
actions with others. For example, language is an important aspect of Puerto Rican culture, as it provides a vehicle for shared meaning among individuals. The Spanish language is preferred in everyday use by the majority of Puerto Ricans residing in the continental United States.³ Language preference is strongly connected to ethnic identity and as García¹² states, “mediates between the private and public spheres of human experience through the formation of personality and the expressive function of behavior” (p. 35). Other important aspects of Puerto Rican culture include personal warmth, hospitality, attention, respect, and the importance of family, or famillismo. In particular, Cortes¹³ maintains that family importance is one of the most distinctive characteristics of the Puerto Rican culture.

Puerto Ricans are more likely than other Latino groups to alter or change health behaviors based on how ill health will affect members of the family. For example, Perez-Stable, Marin, and Posner¹⁴ found that the most influential factors for smoking cessation were not those associated with better individual health, but rather factors associated with family, such as criticism from family members, setting a good example for children, and family pressure.

Research findings in the current literature reveal the intricate nature and importance of the natural support system of Puerto Rican families. This system includes a large network of family, nuclear and extended, as well as friends within the neighborhood and surrounding community,¹⁵-¹⁷ and includes feelings of reciprocity and solidarity.¹⁸ Through these natural support systems, culture is shared, affirmed, and expressed.

In Puerto Rican culture, women are the primary caregivers within the family. Matters related to health and treatment of illness are among the many tasks for which a Puerto Rican woman is responsible in her home. In fact, Puerto Rican women have been referred to as the diagnosticians of the family in times of illness¹⁹ and managers of the health care of significant others.²⁰ This includes the use and management of traditional health information as well as newly acquired health information. The literature reveals that many Puerto Rican women are not able to access basic health information that should be readily available from health care providers and others, however. For example, in a study by Wood, Sasonoff, and Beal,²¹ breast-feeding information was found inadequate among the population of Puerto Rican women who participated.

Many community efforts have been implemented to meet the health information needs of Puerto Rican individuals. A great many of these are the result of community health programming grants obtained through government initiatives. Yet, according to the literature, Puerto Ricans do not readily avail themselves of these programs.²² Hemphill²³ points out that educators need to give serious consideration to the matter of culture and cultural diversity, but on the other hand, we need to be aware of the danger of settling for simplistic recipe knowledge that describes culture as neatly packaged, generalizable, unchanging entities. (p. 9)

Therefore, an understanding of culture is a critical context to also understanding the development of effective community health programs and interventions. As noted above, the degree to which family plays an integral factor in how Puerto Rican women view and interpret health information is largely unexplored to date. That is, what do Puerto Rican women believe about this connection? How does it affect their use of the health care system? What are we missing in light of how Puerto Rican women ascribe meaning to various contexts where health information may be presented?
Clearly, one means to gain knowledge about ethnic individuals and one that avoids a simplistic view of their world is to allow them to participate in research studies about health and health information. Qualitative research studies, such as phenomenology, allow for this type of participation as the voice of the participants is emphasized in the findings.

Although this article cannot address the breadth of the questions posed above, it does shed some new insights on various aspects of health information and the context in which Puerto Rican women encounter this information. Therefore, the purpose of this study was to discover meanings Puerto Rican women attribute to health information sources, as they are the family managers of new and traditional health information. This article will describe the credibility 21 Puerto Rican women ascribe to a variety of health education sources.

**METHOD**

Phenomenology was the method used to guide this research study. Phenomenology focuses on the meaning that experiences hold for individuals and maintains that everyday, lived experiences are a rich source of information. Furthermore, phenomenology is based on the premise that meaning is symbolic for individuals and is responsible for how individuals may react to certain situations. Phenomenology is an invaluable way to view a research question, as it allows participants to talk about life events from a personal and unique perspective. In this research, Puerto Rican women are considered expert insiders regarding the context and value that they place on learning new health information. Learning is “premised on the assumption that education is a kind of exchange between people: the process by which knowledge, skills, values, and beliefs are passed back and forth from individual to individual and from group to group” (p. 141).

**Data Collection**

Sample sizes in qualitative studies are considerably smaller than those found in quantitative research. Lincoln and Guba maintain that in qualitative research, the sample size cannot be predetermined. Lincoln and Guba ascertain that approximately one dozen interviews ordinarily exhaust the phenomenon under investigation, however. They further state, “To include as many as twenty will surely reach well beyond the point of redundancy” (p. 235). In this study, 21 participants were eventually identified and obtained through criterion-based strategies, network and convenience sampling techniques, which are considered appropriate purposive measures in obtaining a sample for a qualitative study.

The goal of purposive sampling is to obtain information-rich cases for the phenomenon under investigation. Furthermore, the intent of purposive sampling is to provide variety and flavor to the many unique features of a phenomenon, rather than to seek out generalities and similarities. Common techniques used in purposive sampling are network, convenience, and criterion-based sampling. The major technique used to obtain this study’s sample was network sampling, also termed snowball or chain sampling. Through network sampling, each participant suggests a new individual for potential participation in the study. Through this process, referrals augment key information-rich sources. This study began by contacting a community gatekeeper of our acquaintance who had strong connections in the Puerto Rican community. This individual provided us
with names of the first participants. These three participants suggested referrals for the remainder of the study.

Criterion-based sampling is based on the establishment of certain criteria for participants before the study commences. This study sought participants who possessed the following criteria for inclusion: identification as an adult, ability to speak English, and identification as a Puerto Rican woman. In the Puerto Rican culture, when a woman has proven herself capable of maintaining her own family unit, she is considered an adult, regardless of age.

The last sampling technique employed was that of convenience. In this study, convenience to the sample population ensured that the community in which the authors live and work was well represented. This study included convenience sampling only to the extent that central Pennsylvania contains a large Puerto Rican population and is also the residence of the investigators.

Finally, an important element of phenomenological research is the ability to bracket, or manufacture, distance. This process of suspending beliefs promotes an unknowingness about a phenomenon. As such, it promotes the ability to attend to preunderstandings about a phenomenon and then to set those aside. As Becker emphasizes, when these preunderstandings or biases about a particular phenomenon are bracketed, they are far less likely to be exacted on participants in a research study. In this study, the investigators accomplished bracketing through self-examination about elements of the Puerto Rican culture, how Puerto Rican women are viewed by health care personnel, and how Puerto Rican women view health information. Journaling is one of the most useful ways of bracketing preunderstandings, and investigators used it in this study.

All participants were volunteers who received both verbal and written explanations of the study and provided signed consent. The participants engaged in interviews that focused on the meaning of health information sources. As the researcher is the instrument in phenomenological investigations, only one of the authors conducted the interviews, which ensured that questions were asked the same way with every participant. A few descriptive, open-ended questions were used to encourage participants to relay their experiences obtaining health-related information. Descriptive questions invite participants to reveal their experiences and perceptions of their world. These include the following: “Tell me where you learn about health information.” “Give me examples of why that information is important to you.” “Describe situations in which you received helpful health information.” Although a set of predetermined questions was used during the interviews, participants were engaged in a conversational dialogue throughout to promote description and discussion. As the format was open-ended in nature, participants were able to talk about their experiences in their own way. Throughout the process, intervention was made to clarify details and follow leads. All participants were eager to expound on their experiences with health care situations.

All of the interviews were conducted in English. No participants were sought who did not feel proficient in the use of English, although Spanish language is highly valued among Puerto Rican individuals. As neither investigator spoke Spanish proficiently and a translator is not deemed appropriate in the collection of interview data, it was decided early on to interview only those Puerto Rican women who speak English well enough to communicate in this study.

Each initial interview took 2 to 3 hours. All of the interviews took place at the convenience of the participants, often in their homes. The interviews were audiotaped with the women’s permission and later transcribed. Follow-up phone calls were made after interviews were completed. Also, each participant received a summary of the findings from
the study and an opportunity to respond. The collection of interviews took place during a 9-month period of time.

Fieldwork in the Puerto Rican community added to the interview data. Puerto Rican grocery stores, community clinics, social service agencies, and botanicas (shops that sell herbal products indigenous to Spanish cultures) were visited. These visits provided triangulation to the narratives supplied by the women.

Data Analysis

Qualitative studies are judged on criteria that speak to their trustworthiness and include credibility, dependability, and confirmability. In this study, credibility was assured through prolonged engagement in the field, instrument sensitivity, or interviewing skill, and triangulation techniques. Multiple opportunities for triangulation were undertaken, particularly investigator triangulation. Both authors read and reread the transcripts in a search for categories of common data and coded them accordingly. The use of two individuals in reading transcripts provides evidence that correct interpretations for the phenomenon under investigation are discovered. Dependability also relies on the use of two individuals, where one external to the study acts as an auditor. This auditor evaluates transcripts, collates a grouping of possible themes, and compares these with that compiled by the investigators.

Confirmability is the counterpoint to objectivity in a quantitative study. In addition to triangulation strategies and the use of an external auditor, a number of materials provide evidence that the process of data analysis is appropriate and that the results are reasonable, credible, and believable. These materials include a reflective journal kept by both investigators; field notes; tapes of interviews; process notes; and a drop file for letters, documents, tables, and letters. These materials also constitute the audit trail, a valuable element that assures confirmability.

The transcribed interviews became the data for the study, the ultimate goal being a search for common themes. First, we analyzed the transcripts for common categories of data and coded these accordingly. We then analyzed these categories for repetitive themes. These themes became the findings of the research. Themes are underlying portraits of meaning of a phenomenon gleaned from the data obtained from the study. During thematic formation, similar views of a phenomenon are uncovered. It should be noted, however, that themes, while containing similar views about a phenomenon, do not discount for important variations that naturally occur within any group. At times, these variations speak to a particular theme and add depth to its understanding. In the end, participants themselves authenticated the themes constructed through data analysis.

In summary, the researcher engaged in phenomenological research is constantly engaged in scrutinizing data, clarifying categories and themes, and verifying emerging themes with the participants themselves. In this article, the findings include themes associated with health information, which are substantiated with the women’s voices.

FINDINGS

Twenty-one Puerto Rican women participated in the study. The women ranged in age from 18 to 43 years of age, with a mean age of 28.4 years. Of the 21 participants, 12 were born in the continental United States and 9 in Puerto Rico. Spanish was the first learned language for 15 women. Education completion ranged from some grade school to gradu-
ate school, with a mean of 11.8 years. Income ranged from $6,000 per year to $45,000 per year, with a mean of $19,900. Number of children ranged from zero to four. Fourteen of the women were married and 7 were single. None were divorced or separated. Health care services used by the 21 participants were almost evenly divided between private health care providers and public clinics.

The participants, while all identified as Puerto Rican, were a diverse group, particularly in socioeconomic status and educational attainment. Yet, the participants validated the themes extrapolated. This is not to say that all participants relayed identical statements about the phenomenon. All the participants recognized the themes discussed in this section as part of their lived experiences, regardless of in-group variation, however.

Puerto Rican women in this study obtain health information through informal and formal learning settings. A variety of settings may serve as sources of health information. These include information shared between friends, remedies handed down through word of mouth, childbirth classes, and health care settings. All of the women talked about particular elements of their culture that may influence their reactions to health information. From the perspective of the participants of this study, the meaning of health information is developed through the lens of Puerto Rican culture.

The themes are organized into trustworthy and nontrustworthy sources of information (see Table 1). In general, the characteristics of the sources led to their being deemed trustworthy or not. For example, a Puerto Rican family member who spoke the Spanish language was apt to be viewed as a trustworthy source. On the other hand, a person outside of the Puerto Rican culture, previously unknown to the participant, and who did not ascribe to pertinent interpersonal relationship aspects of what Puerto Ricans perceive as important to interactions, was considered a nontrustworthy source. The themes that emerged describe how and why Puerto Rican women trust certain sources of health information.

Trustworthiness is descriptive of not only the information but also the source. In many situations, as will be seen in the following narratives, the information may be “good,” but not viewed as trustworthy if the source of that information is deemed to be untrustworthy. In addition, trustworthiness implies authority, value, and credibility. The voices of the women are used here to describe the themes. To provide “personality” to the findings yet protect participants’ confidentiality, fictitious names were assigned to each of the coded transcripts. This is commonly done in the report of findings of qualitative investigations. These will be seen in the following narratives.

<table>
<thead>
<tr>
<th>Trustworthy Sources of Health Information</th>
<th>Nontrustworthy Sources of Health Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follows traditional cultural beliefs and information</td>
<td>Unfamiliar person</td>
</tr>
<tr>
<td>Circulates information by word of mouth</td>
<td>Not Spanish-speaking</td>
</tr>
<tr>
<td>Mothers and other female relatives in the community</td>
<td>Pressed for time</td>
</tr>
<tr>
<td>Extended family members and friends</td>
<td>Impersonal interactions</td>
</tr>
<tr>
<td>Individual health care providers</td>
<td>Requires long waits for services</td>
</tr>
<tr>
<td>Television and radio programs</td>
<td></td>
</tr>
<tr>
<td>Health information brochures at grocery stores</td>
<td></td>
</tr>
</tbody>
</table>

a. Includes family members and friends in the community.
b. Includes most professional health care providers.
Our Way of Being

Culture is a powerful means of transmitting information through centuries of generations. For Puerto Ricans, family is inextricably bound to a great deal of traditional knowledge of health care. Women pass information that is culture bound by word of mouth, one generation to the next, through mothers and daughters. Regardless of the foundation for this information, most of the participants talked about traditional Puerto Rican knowledge as being very important.

Much of the health-related information handed down through word of mouth concerns home remedies, traditionally used for common illnesses. Olga is a 43-year-old mother of three. She was born in the continental United States and has completed a college education. She describes the importance of traditional home remedies to her:

They [Puerto Rican women] do it because it’s a tradition. The things that they use alternatives for is because they’re traditional things passed down... if it’s traditionally passed down and your Mom said it works, it works! And, even if it’s in your mind that it works, it works. I mean, we all know that we can take medicines for days and sometimes whether they are working or not, we also need to feel we’re going to get better. I mean, that’s half of the situation, so, I think that’s why people use alternatives.

Rita is 24 years old, born in Puerto Rico. She has not had the opportunity to complete her high school education and uses a clinic for health care. Rita expresses her thoughts about why a family member, such as her aunt, is considered to be a trusted source of information:

I think, OK, the doctors they study and study and study, so what they say could be true. But I always think somebody that has gone through the experience and knows his true feelings and then it’s true. My aunt, she has the age and she’s been through a lot of experiences. I would rather ask her.

Other sources of trusted health information include friends from the church community. Connie is a 24-year-old mother of three, born in the continental United States. She states,

I think a lot of women, Hispanic women in the community that have been, that are knowledgeable, that are not really scholastically educated women have gotten a lot of knowledge through a church congregation here in [name of town].

Some sources of health information were mentioned, including individual Anglo physicians and nurses. Leona is in her 30s, born on the island of Puerto Rico. She is married and has two children. She uses a private primary care provider and describes a physician close to her family and who was respected and trusted:

So, this doctor, even when he sees us on the street, you know, “Hi, how are you doing?” He’s not necessarily involved in the Hispanic community. I’ve never seen him in the Hispanic community, but he knows this family very well. And, this doctor could make the family comfortable enough with him so that the whole family came and he is their family doctor. He doesn’t speak Spanish, but somehow he has made the family feel welcome in his practice, which is very important to us as Puerto Ricans.
Rosa is 18 years old, married with one child. She was born in Puerto Rico. She talks about an interaction with a nurse that led her to investigate a number of health-related sources and acquire pertinent health information. This nurse was not Puerto Rican:

I met a nurse at the clinic and oh, she was so good to me. When I came here, I didn’t know what to do, where to go, and I called this place and she was helping me so much and she was giving me comfort and she is very special. A very, very good person. She was leading me to places where I could go and get some more help if I needed it. She was the key for me. That’s why I didn’t feel ashamed or I didn’t feel intimidated of going. Because I knew that she was there and would do what was good for me.

These two scenarios depict qualities and values of Puerto Rican culture in the context of the interactions, even though the health care providers were not Puerto Rican. For the participants, the qualities important to the culture are valued even when demonstrated by someone outside of the group.

Other sources of health information sought out by the women include media programming on television and radio. Many women engaged in these types of self-directed activities to procure health information. Elena is 35 and the mother of two children. She was born in Puerto Rico and completed high school education. Elena mentioned the privacy of television programming in the home for her family:

They had a program about breast cancer. They’ve had programs on the uterus and the womb and the birth and all that stuff. They’ve had documents like that. Anything like that has to do with the human body, we love, all of us at home. We all love to watch stuff like that. I guess it fascinates us to no end. And it’s better because one thing, I guess the idea that no one sees, [no one is] watching us. So we’re able to see it comfortably at home.

Also, many of the women talked about the trustworthiness of health information brochures. Interestingly, many of the participants liked to find this type of written health-related information in grocery stores and thought these were good places to find health information materials. In many homes, too, women had health-related books that they had bought or ordered through the mail. Carla, a 25-year-old mother of four children, was born in Puerto Rico. She talks about the importance of health information, as it alerts women to serious health concerns:

The information that is given out [in grocery stores] is like the most important, like cervical cancer stuff. Lumps in breasts, you know, all those things are widely available everywhere and you read that everywhere. I’ve seen it on T.V. I’ve seen it in magazines because those things women are in danger. The most things that women are in danger of, it’s announced everywhere, you know.

**Barriers, Blocks, and Barricades**

The majority of women emphasized that personnel involved in the provision of health care are not particularly trustworthy sources of health information. Much of this distrust stems from a great many barriers that Puerto Rican women face in health care environments. All 21 participants mentioned and then described these barriers in depth. Barriers identified by the women include lack of Spanish-speaking personnel, rude comments made by personnel, lack of time with health care providers, long waits, and lack of personal attention.
Maria is 30 years old and was born in the continental United States. She did not complete high school and her family uses clinic services for health care. She becomes frustrated when she is not able to obtain the information she needs from health care providers, particularly physicians:

I want to know exactly why. I want to know exactly what I have and exactly why I’m doing all this. I don’t think doctors are specific enough with that. I don’t think doctors sit with people and let them know exactly what’s wrong with them, how they can treat themselves and how they can improve their own health.

Born 29 years ago in Puerto Rico, Flora feels that the impersonal attitudes of health care providers actually convey an attitude of superiority and lack of familiarity:

We don’t understand those medical terms. I feel dumb. Because, you know, the doctor or nurse will be talking and you don’t know if they’re thinking, “Are you dumb?” or something. You don’t know. So, when they use those medical terms, like some of us are afraid to ask, “Well, what do you mean?” Time’s I’ll just say, “Yeah, I understand.” And, I don’t understand one word. But when I leave the office, it’s like, “I don’t know. Do they think I am dumb?”

Barbara, a 34-year-old woman, completed college in the continental United States but was born and raised in Puerto Rico. She adds,

There’s some kind of lack of feeling like they [Puerto Rican women] belong. You’re talking about people who love to just, they’re very family-oriented, they’re very, you know, you just get down to earth with them and you just talk at their level and I don’t know that doctors do that all the time.

Many participants emphasized the expressiveness of the Spanish language compared with English. For the participants, many Spanish terms are comfortable and preferable to the translated English versions. Even though all of the women in this study exhibited good use of the English language, many preferred to converse in Spanish, as the Spanish language is highly connected to their ethnic identity. When health care providers took time to provide health information using the Spanish language, the women were grateful for this sensitivity. In addition, women liked to see health-education brochures available in Spanish as well as in English.

In general, the women provided mixed information about community centers. Some found them to be untrustworthy, particularly if they had a bad experience. A number of participants did not know of any place in the surrounding areas that provide health information. Interestingly, there are a number of community centers in the surrounding Latino neighborhood. One such center, located in a large town in central Pennsylvania, was noted to be useful for obtaining health information by a few of the participants. This center is geared toward Latino families and offers workshops and other avenues of health education. Elena remarked,

A lot of people, they got information from that place, and it’s good to know that at least there are some places that is in Spanish and people can read it and go ahead and look for it, at least there is one case.
A Safe Haven

The participants made it clear that Puerto Rican women are very much interested in health and new health information. As Rita offered, “I think a lot of people are interested in their health care. As a matter of fact, sometimes, like I said a little while ago, that’s all they talk about in their conversations.”

Throughout the interviews, the women invariably depicted ideal environments for obtaining health information. According to the participants, these settings should include a comfortable, friendly environment with a lot of books; videotapes; and bright, colorful art depicting the Puerto Rican culture, as well as the presence of Spanish. A homey type of atmosphere would be created by comfortable furniture, facilitating the concept of family. They further added that employees of the ideal community center would be dressed like everyone else and not attired in uniforms of any kind.

Nilda was born in the continental United States and is 22 years old. She is single with no children. She frequently mentioned her family and ideas about family in discussions about health information. Nilda offers the following scenario that vividly describes how a community service center for health information would appear. She emphasizes the importance of family connectedness and the use of Spanish language here:

There couldn’t be a language barrier there. They’d have to be able to sit down and speak to them in their own language. They’d have to understand the family type of idea. You know, it would be the type of place where anybody in the family could go and maybe that educator know everyone in the family. “How’s your Uncle John?” and “How’s your cousin?” or whatever, that kind of thing. It makes a Puerto Rican feel right at home when this person knows a lot of their family. Bringing the conversation down to their home level instead of it being just on a health level.

Participants also said that an ideal community center would provide written materials in both English and Spanish. In addition, Leona said that materials should be available for those who cannot read:

It would look like a library. Books where they can read what they need to learn. In Spanish and English for both. For those who can’t read in English. And tapes for people who can’t read. Because a lot of people don’t know how to read. A library of tapes that explains all medical, and a library of books where you can read and that have pictures [in them].

Accessibility is a key factor in terms of where a health information resource is situated in the community. Participants added that this place should be one that women could walk to, not having to rely on a ride. In addition, health programs or workshops should be available in the evening, which would increase accessibility for those who work in the daytime. Any community that offers health information should be a place that Puerto Rican women can call “their own.”

Pilar is 31 years old and was born in the continental United States. She completed high school and holds a job that supplies health benefits for herself and her two children. As Pilar explains,

I think women would feel very comfortable in going to a place that would be specializing in them and a place that can give them the answers for some of their female problems that they have. When should I have a hysterectomy, when shouldn’t I? If I want to make sure that I can
care for the family. To better themselves. It would [be] ideal to have a place that women per se can call their very own place, a safe haven, if you want to call it. That if you have any questions, the people would have to be very open and forget about the aspect of what religion, what background, whatever. I’m dealing with a female person, and this is what medicine is all about for the female and you take it on your own. You add what’s yours and you take away what’s not yours. And I think if we were given that option of being able to take what belongs to me and leave alone what doesn’t, I think that women in general would enjoy that a lot.

Lucy is 23 and has two children. She was born in the continental United States and has not finished high school. She visits a clinic for health care because she has no other health care options. For Lucy, a safe haven for the dissemination of health information for women would be a paradise:

It would be paradise. They would have everything you needed. All the advice that we needed with our health. There would be an explanation to everything, no matter what you needed to know. There would always be something. It would be paradise.

The women described from a cultural perspective how sources of health information become trustworthy. When barriers present themselves in health care settings in clinics or private primary care offices and prohibit the procurement of health information, the women are very creative about obtaining it by other means. Although existing community centers were not recognized as a particularly good source for health information by most of the women, they did offer detailed descriptions of what such a place should be like to attract Puerto Rican women.

As this study derived from the phenomenological approach, no generalizations should be constructed. Rather, these women expressed insights into how and under what circumstances they judge health information trustworthy and provide a richer perspective related to the phenomenon than what is known. For example, the women in this study underscored how barriers prevent health-related learning from taking place. In contrast, they also emphasized the magnitude of cultural connections with the procurement of new health information. One of the virtues of this qualitative investigation is the use of participants’ words, which illustrate intense emotions and expression of their frustrations with obtaining necessary information. This description is largely missing from quantitative investigations, where lived experiences of participants are not accentuated. Therefore, the relevance of this qualitative study lies in the attempt to capture these voices, which are frequently silent in other types of research.

While discourse of health education issues and related research can be found in the literature, they persist as problematic for Puerto Rican women today. Replication and expansion of this study with other groups of Puerto Rican women would provide additional detail to understanding the meaning of trustworthy and nontrustworthy sources of health information (as defined in this article) and their delivery systems that have not yet been unexplored. Undoubtedly, this work is essential to satisfy the health education needs of Puerto Rican women, which remain unmet.

**DISCUSSION**

Through these narratives, it is evident that the 21 participants value new health information. The rich, underlying foundation of Puerto Rican culture is the basis for construct-
ing new learning opportunities for these women and also for how and when new learning experiences are sought. From the aspect of Puerto Rican culture, these include personal elements, such as friendliness, caring, respect, and *familismo*, as discussed earlier in this article. As personal contact and warmth form the basis for any relationship in the Puerto Rican culture, health information sources were considered reliable and trustworthy by the participants when they also promoted personal interactions. Most of the trustworthy sources were family members, particularly mothers and other female relatives. Others, while neither associated with family nor identified as Puerto Rican, were regarded as trustworthy due to the inclusion of interpersonal values associated with the Puerto Rican culture. These interactions work in building cultural bridges between members of different ethnic groups. Cultural bridges are means of establishing working collaborative arrangements that include aspects of a culture most important to a group of people.

Some sources were not considered to be trustworthy by the women due to lack of the establishment of cultural bridges. The women in this study emphasized lack of personal attention, lack of time, and lack of familiarity as the qualities that ultimately created the perception of the source as untrustworthy. Sadly, health care providers in general were viewed as poor resources for the acquisition of new health information. This is particularly problematic, as ethnic identity factors are rarely addressed in the learning process associated with health information. Yet, it is these very factors that promoted a learning environment for Puerto Rican women in this study. Westburg\(^3^9\) maintains that “Hispanic Americans . . . are not receiving the kind of services they need and want and that patient educators will probably need to reach out to them” (p. 158).

In addition, the Puerto Rican women in this study have not been involved in the planning of health information programming, which simply leads to compromised or lack of real education and learning. Instead, the larger Anglo community has made attempts at programming without the participation of the very individuals for whom the programs are intended. The literature demonstrates this lack of involvement as well.\(^3^8\) Delgado and Santiago\(^4^0\) argue that community-based health education efforts ought to include as many members of a Latino community as possible to effect change in health behaviors. In one study, for example, Peragallo, Fox, and Alba\(^7\) discovered that Latinos were more apt to perform breast self-examinations when those efforts were directed and implemented by the individuals in the communities in which they live. Essentially, these efforts are far more effective when health educators assist, advocate, and monitor rather than deliver the programs.

The lack of Puerto Rican members in established community centers is most likely the primary reason why these were not viewed as trusted health information resources by the women involved in this study. In essence, the natural support systems, such as family, have not been explored, nor have the informal networks of communities been closely examined to develop the type of community health programs that would appeal to the women in this study. To do so, Delgado\(^1^5\) argues that successful initiatives “require an in-depth understanding of who is in the community and how they conceptualize their needs” (p. 127).

In the current arena of managed care and overloaded patient schedules, health care providers are not in a position to offer comprehensive health information to their patients, however. This means that other agencies, particularly those in the community, need to assist Puerto Rican women who want health information and require it for disease prevention.
Implications for Practice

The development of cultural understanding as it pertains to the Puerto Rican culture and the construction of cultural bridges are necessary in all health education programming aimed at improving the health of women in Puerto Rican communities. In addition, the development of cultural sensitivity on the part of health educators involved in new programming efforts is critical to fulfilling the health information needs expressed by women in this study. For example, the use of the Spanish language in both oral and written materials was viewed as highly meaningful by the women in this study. And, while using the Spanish language in health education programs is no guarantee of successful learning outcomes, it at least represents an attempt to build successful cultural bridges.

As mentioned earlier and emphasized through the women’s narratives, familismo is a primary aspect of Puerto Rican culture. The inclusion of family members in health education efforts should be given high priority. This is particularly true for Puerto Rican women and female relatives in workshops or programs that deal with health information. Particularly important would be making use of the connections among women in the Puerto Rican community, especially grandmothers, mothers, daughters, and other female relatives for the dissemination of health information. Dealing within this valued knowledge system will achieve helpful changes in the practice of program development. One way in which this could be done would be to start a discussion group composed of women in the community. As one family begins discussion about specific health programs and information, the network of women’s ways of communicating within the Puerto Rican community effectively starts a chain of events through word of mouth. In essence, through dialogue with each other, the knowledge system of Puerto Rican can be used to generate interest in new topics and ultimately programs.

In addition, more attention should be paid to the very individuals for whom community health programs are developed. This necessitates that those involved with the provision of health information for Puerto Rican women become fully understanding of the elements of Puerto Rican culture in developing new health education resources. The meaning of community for the women in this study exemplifies trust and cultural identity. As Zambrana et al. so wisely emphasize, community programs must be planned and implemented by those individuals who will be affected by them. And, in fact, it is these types of programs that have been the most successful. In this study, the participants found the local Spanish radio station, the use of existing informal networks within a community, and church programs developed and attended by the community’s inhabitants particularly informative. To underscore a point, the women in this study identified these sources as trustworthy and, hence, desired more like them.

Through the narratives, the women were very clear about how they perceive of the “ideal place” in the community for learning about health information. The description of the ideal community center is very much connected to ethnic identity factors of Puerto Rican culture. Puerto Rican women must be involved in new programming aimed at meeting their health information needs. Unless a deep-seated awareness of cultural sensitivity is developed on the part of health educators, a plethora of programs could exist and remain ineffective. In this day of national budgetary concerns and rising health care costs, it is essential that those who plan health education programs develop awareness of what is important to the constituents of those programs. As voiced by the women in this study, a great deal more is needed at a personal level before stamping yet another program ready for implementation at the community level. Allowing a community of people, such as the
Puerto Rican women in this study, to have a majority voice about health information that concerns them directly seems a small matter. As they have demonstrated, they have no dearth of ideas, many of which marvelously describe what such places for learning could be like.

Since this study was conducted, and in the same Central Pennsylvania area, one such community initiative was recently developed. This community effort used the model of community health representatives currently available through government grant initiatives. Developed by concerned individuals in the community, including a few Hispanic women, this center provides a comfortable setting where women can easily access health information about a variety of health issues including diabetes, heart disease, HIV/AIDS disease, and breast cancer, to name a few. Successful programs have been implemented for diabetics and pregnant teens. Yet, issues remain as health care providers in the community do not adequately use the center through consequent referrals. In addition, a thorough needs assessment about what women in the community want to see offered in the center has not been accomplished to date. Regardless, this is a highly commendable effort that demonstrates how one Hispanic community is endeavoring to meet the needs of its women.

**Future Research Directions**

Certainly, more research is needed, particularly that which investigates why existing community centers do not meet the health education needs of Puerto Rican women. As more program grants are made available for community health education, it is critical that any barriers to these settings be identified and explored in depth with those in the community.

More research is needed that uses the voices of women, especially those of Puerto Rican ethnicity. Olmedo argues that it is the women of a culture, specifically those belonging to the Puerto Rican culture, that make the most critical impact on the lives of their families. She states that research must take into account that women take initiatives to deal with their environment and change their circumstances. Such research must pay particular attention to the voices of these women as they themselves create narratives of their lives in their multiple roles not only as women, but also in their relational roles as mothers, wives, and daughters, and in their community roles as organizers and workers. (p. 570)

**Conclusion**

The magnitude of inattention to the health information needs of Puerto Rican women is great. As noted earlier, Puerto Rican women are at risk for many health conditions that are potentially amenable to prevention through health education efforts. In addition, the participants themselves are quite aware of these health concerns and would like to obtain more information on prevention.

No outsider can possibly understand the meaning certain cultural elements hold for Puerto Rican women. As the experts, they should be involved at all stages of health education programs related to their health. The goal is not simply successful programming but rather the improvement of health status. Those who plan programs for the distribution of health information must take into consideration the cultural elements discussed here by the women. Although funding for programs at present is more accessible than in the past,
particularly for those considered underserved in the health care system, such as Puerto Rican women, no program will succeed unless the very individuals who are targeted as recipients are included in all stages of planning.

References

Formative Research to Inform Intervention Development for Diabetes Prevention in the Republic of the Marshall Islands

Leslie M. Cortes, MHS
Joel Gittelsohn, PhD
Julia Alfred
Neal A. Palafox, MD, MPH

Formative research was conducted in the Republic of the Marshall Islands to help develop a diabetes prevention intervention. Methods included in-depth interviews, semistructured interviews, and direct observation of household behaviors in urban and remote settings. Foods were classified into two main conceptual spheres: foods from the islands/Marshallese foods and imported/American foods. Diabetes (nanimij in tonal) is a highly salient illness and is believed to be caused by foods high in fat and sugar, consumption of imported/American foods, family background, and the atomic bomb testing. Physical activity and eating a traditional diet were viewed as important for preventing diabetes. The traditional belief system links a large body with health, and a thin body with illness; however, perceptions are changing with increased acculturation and education about the health risks of obesity. These findings were used to develop a diabetes prevention home visit intervention currently being implemented and evaluated in Marshallese households.

This article presents formative research on the prevention of non-insulin-dependent diabetes mellitus (NIDDM) in the Republic of the Marshall Islands. NIDDM is a major cause of debilitating morbidity and mortality in industrialized countries and increasingly in nonindustrialized countries. As the onset of diabetes in the nonindustrialized world is linked with lifestyle changes associated with the globalization of the world economy and acculturative Western influence, effective primary prevention strategies are desperately needed.1,2 Unfortunately, interventions aimed at the primary prevention of obesity and...
diabetes tend to have a low rate of success. Attempts to intervene often do not succeed due to a lack of understanding about the cultural context in which they take place.

**DIABETES IN INDIGENOUS PEOPLES**

Diabetes has reached alarming proportions among indigenous peoples, especially Native American, Native Canadian, and Pacific Island populations during the past 40 to 50 years. The diabetes “epidemic” in indigenous peoples has been linked to lifestyle changes associated with Western contact acting on a susceptible genotype. The phenotypic expression of NIDDM is in part determined by more proximate factors, such as obesity, increased dietary fat intake, reduced fiber intake, and reduced physical activity. Other more distal factors such as socioeconomic status, degree of urbanization, and access to health care have been shown to affect the health status and prevalence of NIDDM in various populations.

Obesity is perhaps the strongest single risk factor for diabetes. Numerous studies have shown that indigenous peoples such as the Pima Indians, Ojibwa-Cree, Nauruans, Samoans, Native Hawaiians, Chomorros, and the Marshallese have high rates of obesity. Like diabetes, increasing rates of obesity in these populations are due to acculturative changes in diet and activity and to the stresses of modernization. Studies of factors predisposing individuals and populations to diabetes have focused on more proximate and quantifiable measures but have generally neglected to consider cultural factors such as food classification systems, cultural concepts of health and illness, valuation of fatness, ideal body shape, and the symbolic meaning of fatness.

**PERCEPTIONS AND THE MEANING OF FOOD IN PACIFIC ISLAND SOCIETIES**

Considerable literature exists on food practices, food classification, and the meaning of food in Pacific Island societies. In most traditional systems, foods are divided into starchy main foods versus accompaniments, and other foods may be consumed as snacks. In the Marshall Islands, Carruci describes the importance of food quality and status during feasts and identifies several food characteristics to be most admired: size, purity, sweetness, and greasiest or richest foods (pertaining especially to complementary foods). Marshallese food classification systems have the potential for differentially influencing the intakes of individuals. However, to our knowledge, no studies have sought to identify and link these beliefs directly to chronic disease prevention.

**PERCEPTIONS OF IDEAL BODY SIZE**

The value placed on body fatness or thinness is culturally and socially constructed. While in some societies a large body size may be stigmatized, in others a large body size may be viewed as esthetically pleasing, desirable, and/or a symbol of economic success and positive birth outcomes. In the Pacific Island Nations, a great deal of evidence supports the traditional valuation of a larger body size, which potentially creates a barrier for interventions seeking to prevent diabetes by addressing its primary risk factor, obesity.
An investigation of preferred body size in Cook Islanders found large body size to be perceived as healthy and attractive but found this is changing with increasing Westernization. Research in Fiji and among Samoan women both concluded that in the Pacific context, women perceive themselves to have a large body shape, and this does not seem to be associated with negative feelings. Samoan women perceive themselves “fitter, stronger and more attractive” than matched Australian controls who do have negative perceptions of their bodies. However, despite tracking trends in perception, little work has been done to incorporate this information into disease prevention programs.

INDIGENOUS CONCEPTS OF DIABETES

Diabetes is a relatively new illness in the Pacific Island Nations; hence it is appropriate and necessary to understand the sociocultural context and local belief system surrounding sickness and healing in general, as well as people’s understandings of diabetes specifically. Key gaps in the current body of knowledge are people’s perceptions of the salience of diabetes, its perceived causes, symptoms, progression, and treatment-seeking behaviors associated with these perceptions. Interventions will only begin to achieve success after these gaps are better understood and formative research is integrated into the intervention development process. In other settings, understanding the ethnomedical model of diabetes has been critical in developing culturally appropriate interventions.

THE REPUBLIC OF THE MARSHALL ISLANDS

The work described in this article took place in the Republic of the Marshall Islands (RMI), a group of 2,000 islands and islets grouped into 29 atolls and 5 islands approximately 2,000 miles southwest of Hawaii. Estimates projected the population to reach 70,000 by the year 2000, and more than 60% of those people will be concentrated in one of two small urban centers (Majuro and Ebeye). World Bank development indicators place the Marshall Islands in the third quintile of countries with an income of $1,840 per capita. However, this income is based primarily on U.S. economic inputs. Another source of income for those whose family members were exposed to radiation during atomic bomb testing in the 1950s comes from a federal agency that disburses monetary compensation.

The vast majority of the food consumed in the urban areas and much of the food consumed in the remote outlying atolls is imported via container ships. The main exports of the country are copra and tuna. Trees with root systems above soil or near to the surface grow well: coconut, bananas, pandanus, papaya, and breadfruit. Access to imported foods is considerably greater in the two urban centers when compared with the remote outer islands. In addition, U.S. Department of Agriculture food relief programs have led to dependency in some Marshallese subpopulations, particularly those displaced from their home atolls due to the U.S. nuclear weapons testing program and because of natural disaster relief.

The RMI exemplifies a transitional (Pattern 3 or Pattern 4) country using Popkin’s nutrition transition model. This model refers to shifts in the composition of the diet from local, more traditional foods to foods high in total fat, saturated fat, sugar, refined foods, and foods low in fiber. Associated with these dietary changes, degenerative chronic diseases, such as diabetes, coronary heart disease, and cancer, have replaced...
infectious disease as the leading causes of morbidity and mortality and stress the country’s limited resources.

Existing data on health status in the Marshall Islands support this assessment. In her study of nutritional status in one Marshallese atoll, it was found that 42% of men were overweight (body mass index or BMI 25-30) and 21% of men were obese (BMI > 30); for women, 29% were overweight and 27% obese.46 The 1991 National Nutrition Survey looked at 1,144 women aged 15 to 49 years and found 30% overweight and 31% obese.47 In 1986, 25.1% of deaths were related to some condition for which obesity is a predisposing factor, including heart disease and diabetes, breast and gastrointestinal cancers.48

Primary prevention aimed at diabetes is desperately needed in the Republic of the Marshall Islands. The existing health infrastructure is poorly equipped and financed to deal with the high costs of chronic disease, such as diabetes. Patients in need of dialysis must permanently separate from their families and fly to Hawaii to receive care, as no dialysis unit is available in the country. Unfortunately, the vast majority of Marshallese do not possess the financial resources for this level of treatment, and the onset of kidney problems usually leads to death. The primary emphasis is on treatment of diabetes with insulin, oral medication, foot care, and amputation in later stages.

RESEARCH QUESTIONS

The primary goal of the formative research was to collect information that could be used to develop an intervention to prevent diabetes in the Republic of the Marshall Islands. We focused on answering the following questions:

1. What are local patterns of food consumption? How do perceptions of food consumption and cultural norms influence dietary patterns?
2. What are Marshallese perceptions of preferred body size? What value is placed on fatness?
3. What are the local concepts about diabetes, its causes, and how it should be treated?
4. How can this information be used to develop culturally appropriate and effective interventions to prevent diabetes in this setting?

METHOD

Previous studies have described the importance of exploratory methods for primary prevention research and the importance of combining qualitative and quantitative approaches.49-51 This study employed qualitative methods to understand the sociocultural, economic, and environmental context of people’s experiences of diabetes and obesity, and to assess the specific beliefs and perceptions that influence their behaviors. Particular topics and methods were selected through an “iterative process,” meaning decisions about next steps were based on information most recently gathered and analyzed. Topics explored using qualitative methods included food classification systems, typical meals, typical way of eating, infant and child feeding, taste of foods, access to foods (importing and growing), typical activities, common illnesses, cultural valuation of fatness, traditional healing, kinship and family, and knowledge and attitudes surrounding diabetes.
We used quantitative methods to obtain baseline anthropometric measurements and to assess patterns of food intake; methods of food preparation; perceived and preferred body sizes; and knowledge, attitudes, and beliefs surrounding food and activity. Selected results from both the qualitative and quantitative work are presented in this article. A detailed analysis of quantitative risk factors has been presented elsewhere.52

All research was collected in collaboration with the local communities and the Ministry of Health and Environment (MOHE) Health Education Unit staff. Data were collected by Marshallese-speaking research assistants. Training was done on-site by a nutritional anthropologist and a master’s level international health student. Interviews were conducted in either Marshallese or English based on the preference of the respondent. Many people, especially in the urban area, are fluent English speakers. When interviews were collected in Marshallese, they were translated into English. The research project was approved by the Johns Hopkins University School of Public Health Committee on Human Research. Informed consent was obtained from participants.

**Phase 1: Household Survey**

A quantitative survey was initially conducted in 150 households from August 1996 through November 1997, varying in degree of remoteness. Study sites included the urban area of Majuro atoll (n = 75 households), a periurban area of Majuro, known as Laura (n = 25), semiremote Arno atoll (n = 25), and remote Ebon atoll (n = 25). Within each household, data were collected at the individual (demographic, anthropometry) and household (monthly food frequency, economic status) levels.

Anthropometric measurements were conducted on all household members 1 year or older. Height (cm) was measured using a Shorr Board. Weight (kg) was measured on an electronic scale accurate to the nearest 0.2 kg. The household food frequency, administered on the main food preparer of each house (usually the female head of household), included more than 100 different indigenous and store-bought foods. Respondents were requested to state how often in the last month each food had been consumed (never, 1 to 3 times in the last month, 1 to 2 times per week, 3 to 6 times per week, and daily or more). Respondents were then requested to describe the most common forms of preparation for each food consumed in the past month (e.g., boiled, fried in oil, consumed raw, etc.).

**Phase 2: Qualitative Data Collection on Beliefs and Perceptions**

From July 1997 to November 1998, qualitative data were gathered using a variety of methods focusing on beliefs and perceptions relating to food, activity, illness, and the valuation of body size.

*In-depth interviewing.* More than 30 in-depth interviews were conducted with local leaders, mothers, health care professionals, elders, and store owners. The interviews focused on food, concepts of illness and diabetes, changes in lifestyle during the past 40 to 50 years, patterns of physical activity, child rearing and feeding, ideal body size, kinship, household decision making, and traditional healing.

*Free lists of foods and illnesses.* Free listing is a semistructured interviewing method aimed at eliciting the salient items in a domain (a culturally defined category of meaning) from the perspective of a particular group.53 Twenty-five respondents in urban and 25 in remote locales were asked to list all the different foods they could think of. The process
was then repeated for all the different illnesses affecting people in the Marshall Islands (n = 29 urban, n = 8 remote).

**Pile sorts of foods.** Thirty-three urban respondents were asked to freely sort the most salient food items (drawn on cards) into whatever number of piles they desired, using whatever system they desired. The respondents were then asked to explain why they had sorted the foods into particular piles.

**Ranking of foods in terms of fattiness.** Ten urban and 10 remote respondents ranked the most salient foods from their free lists in terms of most to least fatty, using the quick-sort method. In the method, items are divided into “greater” and “lesser” piles when compared with a randomly selected “standard” item, and then each subpile is further divided against a new “standard,” until all items have been sorted along a single dimension.

**Cultural valuation of body size.** To better understand local perceptions of body size, health, and beauty, we developed a scale of nine male and nine female figures, ranging from extremely thin to extremely obese, modified by a local artist from Stunkard et al. for use in the Marshallese context. Twenty-five urban and 25 remote adult respondents of both genders were asked six questions about the range of figures: (1) Which figure is most like you? (2) Which figure would you most like to be in the future? (3) Which male figure appears most healthy? (4) Which female figure appears most healthy? (5) Which male figure appears most attractive/beautiful (just right)? (6) Which female figure appears most attractive/beautiful (just right)?

**Phase 3: Qualitative Data Collection on Behavior**

From October 1997 to November 1998, additional qualitative data collection focused on exploring behavior, both observed and reported.

**Unstructured observations of eating behavior.** Twenty households in urban and remote locales permitted us to informally observe during mealtimes. We used this opportunity to identify key behaviors that placed individuals at risk of increased energy intake, such as sources of fat added during meal preparation, order of serving and eating, portion size, amount consumed, amount remaining on the plate, sharing of foods, sharing of plates, and feeding of children.

**Knowledge, Attitudes, and Beliefs (KAB) Survey.** This instrument required respondents to agree or disagree with a series of statements about beliefs and behavior regarding food, diabetes, activity, and the cultural valuation of fatness. Respondents were from urban and remote settings. Development of this instrument was based on prior formative research. The instrument was performed on the male and female head of household in 81 households (n = 161), a subsample of the original 150 households from urban and remote locales.

**Data Analysis**

Textual data were accessed during data analysis to examine patterns, domain analysis, and ethnomedical modeling of key concepts. Systematic data (free lists, pile sorts, and rankings) were analyzed using the Anthropac software program (version 3.2).
data were analyzed using a multidimensional scaling (MDS) procedure, which produces a two-dimensional map with items placed in approximate proximity to other items based on how people grouped them into piles. Hierarchical clustering analysis provided a refined picture of which items were more likely to be grouped together by respondents. A score for fattiness of foods was developed by taking a mean rank of each food item across all respondents by locale.

RESULTS

Using Centers for Disease Control and Prevention (CDC) BMI cutoffs of the 95th percentile, approximately 10% of children are at risk for obesity in the study sample. Between the ages of 18 and 50, 19.8% of men and 32.8% of women are obese. After the age of 50, the rates of obesity are 31.4% and 33.3%, respectively. More important, a substantial proportion of children in the study households were undernourished. About one-third of men and female children 1 to 10 years are stunted (< –2 standard deviation height for age of the National Health and Nutrition Examination Survey II [NHANES II] reference standards) , and a substantial proportion have low weight for age (< -2 standard deviation weight for age of NHANES II reference standards) (boys: 21.4% 0 to 4.9 years, 13.4% 5 to 10 years; girls: 33.3% 0 to 4.9 yrs, 12.0% 5 to 10 years).52

Local Classification of Foods

Our respondents primarily differentiated between monainailinkein/monainMajol (foods from our islands/Marshallse foods) and monainbele (imported foods/American foods). Woven throughout their discourse was the perception that traditional Marshallese foods are more healthy than imported foods, tied to a recognition of dietary change. “In the olden days people never ate canned goods. They only ate what came from the sea. We were very healthy then” (woman, age 40, urban).

From the free lists, we found that the most salient items in the mona in ailin kein were breadfruit (100%), pandanus (91%), banana (91%), papaya (83%), taro (74%), fish (74%), pumpkin (65%), drinking coconut (ni) (57%), coconut crab (52%), fermented breadfruit (48%), coconut embryo (43%), pig (35%), clams (30%), local chicken (26%), arrowroot (26%), sea turtle (26%), sweet potato (17%), lime (17%), and two types of shellfish (small clams and snails) (17%). The most salient items from the mona in bele category were rice (75%), flour (55%), oranges (50%), chicken (50%), corned beef (50%), apples (50%), ramen (40%), Spam (30%), egg (25%), steak (25%), cabbage (25%), tuna (25%), beef (25%), cola (25%), carrot (20%), and bread (20%).

The pile-sorting exercise came up with a somewhat different classification system. Urban respondents sorted food into piles by three major groups. The following terms were used to describe these main groupings (clockwise from the top): (1) “meats” or “bodybuilding,” (2) “energy foods,” and (3) “fruits and vegetables” or “protective foods.” These three main groupings represent the current health education model used to teach nutrition in the Marshall Islands, which also uses three groups: bodybuilding, energy giving, and protective. Most respondents also gave secondary classification systems. Within the first grouping of “bodybuilding foods,” respondents differentiated between healthy, local foods (to the left) and unhealthy, imported foods (to the right). Within the “energy
foods” grouping, lard and oil were frequently set aside as being “not foods,” and soda, chocolate, sugar, ice cream were described as “sweets.” In the “vegetables and fruits” grouping, imported foods were again differentiated from local foods.

**Local Perceptions of Kirij (Fat)**

The Marshallese word *kirij* (derived from the English word *grease*) refers to fat in a variety of ways, for example, shortening or lard, body fat, animal fat, drippings of fat, and the fatty, greasy quality certain foods possess. These multiple meanings of kirij appear to influence the perception of fat in foods. The quality of kirij is associated with a greasy taste of foods identified as complements (*jelele*), typically meats. Foods categorized as staples are not generally perceived to possess this quality of fattiness. Thus, a staple such as rice prepared with coconut milk is high in total fat but is not described using the word *kirij*. Foods that are perceived to be extremely fatty are considered complement foods of high status and are common parts of food exchanges. Oily foods were highly preferred by many of our informants.

It’s the oily taste and the salty taste that is so good . . . when it comes to corned beef I prefer it warmed or fried—a little warm. I can eat it without cooking, but for Spam . . . I just love the way it tastes. (working woman, age 56, urban)

Respondents in urban and remote locales were asked to rank most commonly mentioned foods by the amount of kirij they were perceived to contain (Table 1). In the urban setting, shortening, oil, and various forms of meat were perceived to contain the most kirij. Interestingly, both canned tuna in water and canned tuna in oil were among the foods considered the most fatty (average rank ≤ 10). Local plant foods were considered the least fatty (average rank > 20), including fermented breadfruit, pumpkin, coconut water, and banana. Interestingly, the very least fatty food was coffee, an imported food. Ice cream and chocolate tended to not be considered fatty foods. In the remote setting, fatty foods are meat, while vegetables tend to be considered the least fatty.

**Overall Food Consumption Patterns**

Patterns of food consumption reflect locale. Urban households in the Marshalls are much less likely to eat island foods and much more likely to consume store bought foods (Table 2). Of locally produced foods, the most commonly consumed foods across all sites are reef fish, banana, and breadfruit. Local foods such as papaya, banana, breadfruit, and coconut are 2 to 4 times more likely to be consumed in remote areas. A reverse trend is seen in the consumption of store-bought food items. Canned meats, ramen, milk, and pop were 2 to 5 times more likely to be consumed in urban areas than in remote areas.

We examined preparation methods of the most commonly consumed foods. Primary methods of cooking are boiling or frying in oil. When asked to name their primary method of cooking reef fish, 41% of respondents reported boiling, while 26% said roasting and 23% said frying in oil. Frying in oil is the most commonly reported secondary method of cooking reef fish. Deep-sea fish are most commonly eaten raw (50%), followed by frying in oil (14%). Frying in oil is also the most common reported secondary method of cooking deep-sea fish.
In general, we found a recognition that not only had the diet changed in the past one to two generations but so had the most common methods of preparing foods—particularly in urban areas.

[People] also like to eat the canned meats, [as opposed to fresh fish, pig, or chicken] lifestyle, you know, nowadays people want to use the rice cooker instead of local ways of cooking. Kind of getting lazy. (woman, age 36, urban)

Our informants mentioned the convenience of processed packaged and prepared foods in comparison to the alternative of hard work gathering food. Canned, preserved foods do
not need refrigeration and will not spoil on long trips to the remote atolls. Many canned foods are eaten directly from the can without heating.

**Typical Meals**

In a typical day, a Marshallese family has three meals; a morning meal, a midday meal, and an evening meal. Poorer families may skip a meal. The largest meal is usually the midday or evening meal. Snacking between meals is common. Meals are composed of a staple and a complement (jelele). When an informant was asked about a typical meal, she observed,

A typical meal? Rice, rice with coconut, or rice alone with just salt and pepper. People need to eat rice everyday. . . . We don’t have a complete meal all the time. But sometimes it should be breadfruit, fish, sprouted coconut either baked or boiled, and rice. And then bananas with it, too. (woman, age 42, urban)

As illustrated above, the choice of complement can vary. As long as the staple food (rice, breadfruit, pancake) is accompanied by something, it is considered a complete (although perhaps not ideal) meal (Table 3). This variation in complement appears linked to the economic status of the household, with wealthier households eating some form of meat or fish as the jelele and poorer households adding salt, soy sauce, or some other condiment.

Morning meals typically consist of a bun made from white flour with butter, pancakes with butter (common in the outer islands), or donuts with tea or coffee (usually consumed

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**Table 2. Percentage of Times Selected Food Eaten Three Times or More per Week in a Household, Across Locales**

<table>
<thead>
<tr>
<th>Food</th>
<th>Urban (n = 75)</th>
<th>Periurban (n = 25)</th>
<th>Semiremote (n = 25)</th>
<th>Remote (n = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reef fish</td>
<td>57</td>
<td>56</td>
<td>48</td>
<td>76</td>
</tr>
<tr>
<td>Clams</td>
<td>5</td>
<td>4</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>Coconut crab</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>16</td>
<td>12</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>Papaya</td>
<td>7</td>
<td>24</td>
<td>36</td>
<td>52</td>
</tr>
<tr>
<td>Banana</td>
<td>23</td>
<td>24</td>
<td>32</td>
<td>52</td>
</tr>
<tr>
<td>Breadfruit</td>
<td>40</td>
<td>64</td>
<td>72</td>
<td>84</td>
</tr>
<tr>
<td>Coconut</td>
<td>21</td>
<td>84</td>
<td>64</td>
<td>80</td>
</tr>
<tr>
<td>Canned fish</td>
<td>59</td>
<td>52</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Beef</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Spam/corned beef</td>
<td>41</td>
<td>28</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>White bread</td>
<td>87</td>
<td>60</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>White rice</td>
<td>95</td>
<td>100</td>
<td>84</td>
<td>80</td>
</tr>
<tr>
<td>Ramen/macaroni</td>
<td>61</td>
<td>40</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>Biscuit</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Milk</td>
<td>71</td>
<td>56</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Pop</td>
<td>20</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Tea/coffee</td>
<td>67</td>
<td>68</td>
<td>40</td>
<td>64</td>
</tr>
</tbody>
</table>
with evaporated milk and sugar). A child’s morning meal is similar, but the child would consume less food. The size of an adult’s midday meal typically depends on the schedule of the individual, whether it is a workday or weekend, and if it is an urban or remote locale. A large portion of rice is almost always consumed with some type of complement like a chicken quarter-leg, turkey drumstick, reef fish, or canned meat. Rice and meats are usually eaten with soy sauce. Common side dishes in the midday meal are potato salad (urban areas) or breadfruit with coconut milk (kalel) or fermented breadfruit (bwiro) (if in season in remote locales). Dinner is similar to the midday meal but is typically chicken in the urban areas and canned meats (tuna in oil or corned beef) or locally caught fish in the remote locales.

### Eating Habits

Many informants emphasized how eating habits and meal patterns have drastically changed in recent years,

In the olden days, if there were three women and five men, they will prepare food on the same fire and use the same pot. . . . Our custom in food preparation has changed. Food was very scarce in the olden days, thus there were conservative ways in food preparation. To avoid food problems, only one fire and one pot were used. After the food was cooked in that one fire hole, the Alab (leader) for that bwij (mother’s familial group) would divide the food. (elderly man, remote)

Food was equally distributed among all of the members of the group, and everyone ate together. This tradition does not appear to exist today in the urban area. The traditional communal eating pattern has changed drastically with migration, acculturation, and time constraints on working parents. In both urban and remote settings, we observed most families’ members to eat separately or in small subgroups as they got hungry, rather than all together as formal meals.

*Eating behaviors of children.* After about 18 months, we observed that children tend to be very mobile and wander from house to house, thus it is difficult for parents and primary caregivers to monitor their consumption. There is little if any active encouragement from parents or caregivers of children to eat. The majority of young children ate at shared plates with other adults and children.

These observations are supported by the KAB survey results. Almost half (44.7%) the respondents felt that children know how much they want to eat and need no encourage-
ment to eat. Of the respondents, 50.9% agreed that children should eat as much as they want of whatever foods they want, and 29.8% agreed with the statement that children should only eat the types of food they want to eat and not worry about other foods.

Eating behaviors of adults. Female adults are the main food preparers for the household and have ready access to food throughout the day. We observed a great deal of snacking by women in Marshallese households. Women tend to eat the leftovers from all plates, including that of their and other’s children. Adult men tend to be highly mobile and frequently eat outside their homes.

From the KAB Survey, we found strong evidence of cultural norms supporting a heavy consumption of food among women in particular: 83.3% of people agreed that a nursing woman should eat about twice as much food as a woman who is not nursing, 75.2% of people agreed that a woman should eat her child’s leftovers, while 62.1% of people believe it is healthy for a woman to eat her child’s leftovers.

Local Concepts Shaping the Cultural Valuation of Body Shape/Size

Body size is associated with health and beauty in the Marshall Islands. In discussion on the topic of desired body sizes for men and women, a common greeting was noted: “ko kiel lip lok jen mokota.” (“Oh you look good; you look fatter than you did before”). This expression is commonly used when you may meet a relative or friend you haven’t seen for a long time. Thinness was generally perceived as a sign of ill health. One young male informant noted, “Some people may think, ‘Oh are you sick or something?’ Could be many kinds of sick, maybe like diarrhea, TB, we can add all those things.” In addition to associating a large body size with health, people linked body size with being wealthy and rich. An informant explained,

Because when you see fat people, you think that those people are rich and can afford everything. It means they can buy those expensive foods like steak and chicken all those meats in the store. In their houses, they have an air conditioner and a TV so they don’t ever work outside their house. They spend all their time watching TV and listening to the radio. (male, age 27, urban)

Results from the assessment of the cultural valuation of body size are summarized in Table 4. Urban respondents, on average, saw themselves as one body size larger than their remote counterparts. More important, on average across locale and gender, most respondents were satisfied with their body and did not desire a change in their body size. Remote

<table>
<thead>
<tr>
<th>Question</th>
<th>Urban (n = 25)</th>
<th>Remote (n = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where do you see yourself?</td>
<td>5.7</td>
<td>4.1</td>
</tr>
<tr>
<td>What size do you want to be in the future?</td>
<td>5.7</td>
<td>4.4</td>
</tr>
<tr>
<td>Which figure is the size of a healthy male?</td>
<td>5.2</td>
<td>4.7</td>
</tr>
<tr>
<td>Which figure is the size of a healthy female?</td>
<td>5.2</td>
<td>4.9</td>
</tr>
<tr>
<td>Which figure is the most beautiful/pleasing male?</td>
<td>4.9</td>
<td>4.1</td>
</tr>
<tr>
<td>Which figure is the most beautiful/pleasing female?</td>
<td>4.9</td>
<td>4.2</td>
</tr>
</tbody>
</table>

*a. On a scale ranging from 1 to 9, where 1 = very thin and 9 = very heavy.*
respondents perceived a healthy male or female figure to be about one to two body sizes larger than their own perceived body size, respectively. Urban women showed a similar pattern, but this was not observed for urban men. Both urban and remote respondents felt that a more beautiful body size was about one size smaller than their current body size. Both men and women indicated that what they considered to be healthy body sizes were one to four sizes larger than what they considered to beautiful body sizes. Thus, most Marshallese appear to feel that compared to their own body size, healthy (ejmour) bodies are larger bodies but that thinner bodies are more attractive (jet jet tata).

Respondents were also asked to describe the two extreme figures 1 and 9 to elicit attitudes associated with being extremely thin or extremely obese. Although 22.6% perceived the most obese figure to be unhealthy, 19.4% still describe this figure as healthy, while only 9.7% feel the extremely thin figure is healthy, and 58.1% described it as “unhealthy.”

**Local Concepts of Diabetes in the Study Community**

Free listing of illnesses shows diabetes (tonal) is a significant concern of the Marshallese people. From the free listing of salient illnesses (Table 5), both urban and remote respondents listed diabetes more frequently than any other illness, followed by diarrhea, arthritis, tuberculosis, headache, cancer, and high blood pressure. Interestingly, a substantial number of respondents mentioned kidney disease, indicating some basic level of awareness of this complication of advanced diabetes.

In-depth interviews with informants revealed a complex conceptual model of diabetes. Many respondents attributed the recent increases in numbers of people affected by diabetes to radiation from the United States’ nuclear testing program. This perception is widespread, particularly among people with diabetes:

> Diabetics blame you Americans. They say that the cause of diabetes is from you poisoning them. This cause of diabetes is now a problem because of the bomb, they say it is a big part of it. We tell them that we inherit it from the old people, but they say those old people didn’t become diabetic. They say it is poisoning from the bomb. More than once I have heard this. (middle-aged man, urban)

Other informants noted lifestyle changes as the cause of diabetes,

> Nowadays, even young people get diabetic. People in the old days do a lot of moving. When they want to go somewhere now, they just take a taxi or ride a motor boat rather than paddling a canoe. These days there is a lot of sitting. . . . [Back then] . . . people didn’t get sick, so they did a lot of work. Now, instead of getting firewood we just plug in the rice cooker. (middle-aged man, urban)

Data from the KAB Survey and the in-depth interviews were combined to create an overall ethnomedical model of diabetes in the Marshall Islands (Figure 1). The KAB Survey results found that the overwhelming majority (83%) agreed with the statement, “If your parents have diabetes, you will definitely get diabetes,” indicating both a recognition of familial linkage of the disease and a certain degree of fatalism. A majority of respondents (54%) agreed with the statement, “Diabetes in the Marshall Islands is caused by the atomic bomb tests.” On the other hand, only 28% agree with the statement, “Diabetes in the Marshall Islands is sometimes caused by black magic.”
Food is an important part of the local ethnomedical model of diabetes. People generally believe that mona in bell are unhealthy compared with mona in ailin kein. Of the respondents, 81% agreed with the statement that “diabetes is caused by eating too many ribelle/American/imported foods,” 93% agree that eating lots of fruits and vegetables can help you avoid diabetes, and 78% believe that eating sweets causes diabetes. Similarly, 78% people agreed with the statement that eating less fat can prevent diabetes. More important, 86% respondents agreed with the statement that island foods are always healthier than American/imported foods, regardless of how they are prepared.

Table 5. Results From Free Listing of Illnesses Salient in Remote and Urban Locales

<table>
<thead>
<tr>
<th>Marshallese</th>
<th>English Equivalent</th>
<th>Urban (n = 29)</th>
<th>Remote (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Tonal</td>
<td>Diabetes</td>
<td>20</td>
<td>69</td>
</tr>
<tr>
<td>Bidodo</td>
<td>Diarrhea</td>
<td>19</td>
<td>65</td>
</tr>
<tr>
<td>Kiro</td>
<td>Arthritis (joint pain)</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>TB</td>
<td>TB</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>Metak Bar</td>
<td>Headache</td>
<td>12</td>
<td>41</td>
</tr>
<tr>
<td>Cancer</td>
<td>Cancer</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td>Aiblut</td>
<td>High blood pressure</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td>Feaver</td>
<td>Fever</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td>Lepa</td>
<td>Leprosy</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>Jeblij</td>
<td>Syphilis</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>Jabwe oon</td>
<td>Malnutrition</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>Ameba</td>
<td>Ameoba</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>Nimonia</td>
<td>Pneumonia</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>AIDS</td>
<td>AIDS</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Wot</td>
<td>Boil</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>Bokbok</td>
<td>Coughing</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Bilo</td>
<td>Pink eye</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Tumor</td>
<td>Tumor</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Metak Ni</td>
<td>Toothache</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Kutni</td>
<td>Kidney disease</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Maj</td>
<td>Worm</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Kito</td>
<td>Ringworm</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Kajinok</td>
<td>Shortness of breath</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Molanlon</td>
<td>Nausea</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Metak ob</td>
<td>Chest pain</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Metak dri</td>
<td>Back pain</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Bok</td>
<td>Measles</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Karko</td>
<td>Scabies</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Molo</td>
<td>Cold</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Bwill</td>
<td>Burn</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Gonorhrea</td>
<td>Gonorrhea</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Naninnj in jiron im likao</td>
<td>STD a</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Flu</td>
<td>Flu</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Bolio</td>
<td>Polio</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Aljer</td>
<td>Ulcer</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Jen</td>
<td>Tinea</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

a. STD = sexually transmitted disease.
Our Marshallese informants generally perceived a diagnosis of diabetes to be a virtual (although not immediate) death sentence, with intermediate stages of thinness, blindness, and amputations. It could be treated with Marshallese or hospital medicine.

**Discussion**

This article has presented the results of a formative research study aimed at developing diabetes prevention interventions in the Republic of the Marshall Islands. We explored current practices; local concepts; and valuation of food, body size, and diabetes. Our findings are comparable to other exploratory studies of chronic disease among indigenous peoples. In Native American concepts, very similar classifications of food into traditional versus introduced categories exist, with similar perceptions of the negative health consequences of recent changes in the diet. We have also found parallels in terms of the salience of newly emerging chronic diseases, such as diabetes and in terms of modifications in the traditional valuation of larger and smaller body sizes.

The study had some limitations. First, most of the qualitative data were collected in only one urban area (out of two possible) and in one remote atoll, possibly limiting the representativeness of the information. Second, much of the formative research focused on...
identifying beliefs and perceptions (of food, activity, diabetes, body size valuation, etc.) and collecting information on reported behaviors (e.g., frequency of consumption of foods, how prepared, etc.). There is a gap between this information and meeting the goals of health intervention trials, which are primarily aimed at changing actual behavior.

The formative research described in this article has been directly incorporated into an intervention program, which is currently being implemented and evaluated in 160 households in the Marshall Islands. In collaboration with the MOHE, we developed a series of overall guiding principles for action, selected an intervention format that we felt would be most appropriate and successful in this setting, and developed specific content for the intervention based on formative research results.

**Intervention Locale and Format**

Most of the recent, community-based diabetes prevention interventions in indigenous peoples have been implemented with children or adolescents, usually in the context of schools. However, the intervention developed for the Marshall Islands takes place in the home and attempts to work with the entire family. This broader emphasis was taken in part due to formative research findings that Marshallese households contain substantial childhood undernutrition as well as obesity in adults. The intervention is delivered in a series of five home visits each approximately 1 hour or 2 in length. Each visit includes one episode from a flip-chart storyboard that is 10 to 11 pictures in length, with a “script” in Marshallese that is read by the health educator to the family. The stories are about a Marshallese family dealing with diabetes and undernutrition. We have tried to make the stories interesting and relevant to the whole family, including teens, grandparents, men, and women. The story line incorporates traditional stories in two of the episodes. Reinforcement materials include posters of everyday foods, a lower fat pancake recipe, sometimes foods, and a fortified low-fat pancake recipe. Reinforcement foods provided to families include low-fat pancake ingredients, cooking spray, lower fat canned foods (such as canned pork and beans and tuna in water). A mealtime behavior-oriented thoughts-to-live-by brochure and completion certificate are also provided to households.

**Guiding Principles for the Intervention**

A series of guiding principles were developed on the basis of the formative research, discussion with MOHE partners, and incorporation of key constructs drawn from Social Cognitive Theory.

- The intervention should emphasize the need for family members to support change in each other and facilitate goal setting among family members to promote trying new things.
  
  *Content example:* The stories include characters who learn from each other and work together to support beneficial changes in diet and physical activity.

- The intervention should incorporate an interactive/participatory component and provide a hands-on exposure to new foods and new cooking methods.
  
  *Content example:* At the end of most sessions, a cooking demonstration or taste testing of a lower fat food is held in each family’s home, where a lower fat version of a commonly consumed food is prepared (e.g., pancakes).

- The intervention should use culturally accepted methods of communication.
Content example: The “teachers” in the stories are the parents of the female head of household. In traditionally matriarchal Marshallese society, these are the most appropriate educators.

• Repetition of key messages/themes for reinforcement of the intervention should be built into the intervention through multiple media.

Content example: Traditional Marshallese stories are included in the curriculum to reinforce key messages. The use of traditional stories and concepts has been successfully employed as part of diabetes prevention education programs in indigenous peoples.61

• Concepts of health and beauty must be understood within the Marshallese cultural context and used to create appropriate messages to promote health, especially with regard to women.

Content example: Little or no emphasis is placed on obesity prevention per se in the curriculum, as being heavy is actually seen as a sign of health and has other positive associations. Instead, we emphasize the need to live a healthy lifestyle to deal with and avoid diabetes.

• Health education efforts should address people’s perceptions of the causes of diabetes.

Content example: The curriculum centers on the problem of diabetes, which is highly salient in the Marshall Islands. At key points during the presentation of materials, open discussions are held about a variety of issues, including perceived causes of diabetes. Here the emphasis is not to disprove local theories but to emphasize and reinforce theories relating to appropriate diets and the need to increase activity.

• The intervention should target key behaviors and meal patterns based on the formative research that place family members at risk of obesity and undernutrition.

Content example: In shared plate eating, we suggest that mothers encourage their children to finish foods on their plates, rather than themselves consuming leftover foods.

• The selection of key foods and food preparation methods incorporated into the intervention materials should be based on formative research.

Content example: Lower fat recipes are taught for foods that contribute high amounts of fat in the diet, such as pancakes. Lower fat methods of preparation are taught for commonly consumed foods, such as roasting chicken rather than panfrying, and for the preparation of readily available commodity foods.

• Dietary recommendations must be carefully planned, incorporating taste preference, need for convenience, access to food, and local perceptions of food classification.

Content example: An emphasis is placed on eating healthy island foods when available, thereby reinforcing cultural perceptions. We also teach that the manner of preparation can turn a healthy island food into an unhealthy food.

Implications for Practice

This study provides a model for the collection of formative research on diabetes in different populations. We integrated formative research on cultural valuation of fatness and perceptions of a healthy body size, knowledge about attitudes and beliefs about foods, and perceptions of diabetes and child feeding, and used this information to develop a home visit–centered diabetes prevention curriculum that is currently being implemented in the Marshall Islands. The formative research information was used to (1) identify the
appropriate medium for effective communication of intervention (i.e., stories, songs, etc.); (2) select culturally appropriate concepts and vocabulary with which to address foods, activity, obesity, and diabetes; and (3) identify sociocultural, economic, or behavioral determinants that provide both support and barriers to the successful prevention of diabetes in the Republic of the Marshall Islands. We feel much of the information presented here is relevant to other countries in Micronesia and probably to other Pacific Island Nations. Such work is desperately needed if we are to stem the spread of diabetes and other chronic diseases in nonindustrialized countries, most of which lack the economic resources to cope with high levels of chronic disease morbidity.

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The Relationship Between Social Cohesion and Empowerment: Support and New Implications for Theory

Paul W. Speer, PhD
Courtney B. Jackson, MA
N. Andrew Peterson, PhD

Empowerment theory represents an expansive view of individual and collective behavior that includes the active participation of individuals and groups in altering and shaping the socioenvironmental context. Critical to health educators are local interventions that yield participation of community members and empowerment for participants. The concept of social cohesion embraces participation but expands this behavioral emphasis to incorporate notions of trust, connectedness, and civic engagement. This study presents two data sets on the relationship of participation to empowerment. The first replicates and extends previous research by examining participation with interactional as well as intrapersonal empowerment. Second is the examination of how the quality of the participatory experience—the cohesive nature of participation—is related to interactional and intrapersonal empowerment. Findings support and extend previous findings, reliably cluster residents by the degree of connectedness in their participatory experiences, and reveal that social cohesion is related to intrapersonal empowerment.

The field of health education has traditionally placed greater emphasis on individual health behaviors than on community, social, and economic factors that define lifestyle choices available to individuals. Increasingly, however, health educators have embraced empowerment as an alternative framework to this traditional approach to health.\textsuperscript{1-5} Empowerment has been defined as "an intentional ongoing process centered in the local community, involving mutual respect, critical reflection, caring, and group participation, through which people lacking an equal share of valued resources gain greater access to and control over those resources."\textsuperscript{6}

Health educators have focused on empowerment interventions as a major practice strategy in promoting health. One key component of empowerment targeted by health educators is the participatory processes engaged in by individuals as they work to improve their quality of life.\textsuperscript{1} While the principles of health education practice include collective participation in planning, implementation, and evaluation,\textsuperscript{7,8} and many interventions by health educators have successfully involved community participants in inter-
ventions,\textsuperscript{9,12} more work needs to be done on the principles and theories that anchor the relationships between participation and empowerment.\textsuperscript{7,13}

Much of the theoretical work on empowerment has been associated with Zimmerman and colleagues.\textsuperscript{2,14-19} Although empowerment may operate at multiple levels of analysis, much work has emphasized how empowerment is manifested at an individual or psychological level of analysis.\textsuperscript{17} Zimmerman has theorized that psychological empowerment operates through intrapersonal, interactional, and behavioral components.\textsuperscript{15} As an intrapersonal component, empowerment addresses the manner in which individuals think about themselves and includes concepts of perceived control, self-efficacy, motivations to control, and perceived competence.\textsuperscript{17} The interactional component of psychological empowerment assesses how people understand and relate to their social environment. Interactional characteristics address one’s ability to develop a critical understanding of the forces that shape their environment and knowledge of the resources required and methods to access those resources to produce social change. Interactional characteristics include leadership skills, problem solving, and critical awareness.\textsuperscript{13,14,17} The behavioral component of psychological empowerment includes actions that address needs in a specific context.

In a previous study, empowerment theory was tested by linking measures of intrapersonal empowerment to participation.\textsuperscript{18} Measures of intrapersonal empowerment significantly discriminated amounts of participation. The study called for future research including measures of interactional empowerment. Given the focus on socioenvironmental change in the health education field,\textsuperscript{1,6,19} interactional empowerment, which emphasizes understanding of the social environment, is an important construct to study.

In addition, an emerging construct in the health field with relevance to work on empowerment is social cohesion. Social cohesion addresses the level of engagement and social trust among community members.\textsuperscript{20-22} Much of the work on social cohesion has considered the construct a product of disparity of wealth within specific populations, which subsequently leads to negative health outcomes.\textsuperscript{23} The primary hypothesis for this phenomenon is that as inequality increases within communities or societies, it serves to undermine the social fabric. Following Durkheim’s theory of the individual and society, social integration is an essential component of a healthy society. As the social fabric is frayed, people fall out of relationship with one another leading to greater social isolation, declining civic trust, lower levels of participation, and less investment in social infrastructure—in Durkheim’s terms, they experience “anomie.” When individuals experience anomie and lack social integration, they become vulnerable to many problems, including health problems. In support of this hypothesis are studies on interpersonal factors such as social networks and social support that have been found to be positively associated with individual health.\textsuperscript{24,25}

This article presents data from two studies. The first extended a previous test of empowerment theory\textsuperscript{18} by examining the relationship of intrapersonal and interaction empowerment with participation. This study both replicates previous literature by examining participation and intrapersonal empowerment and adds to the literature by testing interactional empowerment in this model. A second study builds on the first by examining how the cohesive nature of participatory activities influences intrapersonal and interactional empowerment.
Table 1. Demographic Characteristics of the Samples

<table>
<thead>
<tr>
<th></th>
<th>Study 1</th>
<th></th>
<th>Study 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
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<td></td>
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<tr>
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<td>285</td>
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<td>Female</td>
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<tr>
<td>African American</td>
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<td>34</td>
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<td>White</td>
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<td>575</td>
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<td>Hispanic</td>
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<td>11.1</td>
<td>64</td>
<td>9.1</td>
</tr>
<tr>
<td>Other</td>
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<td>34</td>
<td>4.8</td>
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<tr>
<td>Age</td>
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<tr>
<td>18 to 24</td>
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<td>77</td>
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<td>25 to 44</td>
<td>270</td>
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<td>348</td>
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<td>75</td>
<td>10.7</td>
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<td>Income</td>
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<td>Education</td>
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<td>Less than high school</td>
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<td>7.8</td>
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<tr>
<td>Some college</td>
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<td>25.7</td>
<td>148</td>
<td>21.1</td>
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<tr>
<td>College graduate or higher</td>
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<td>229</td>
<td>32.7</td>
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<td>Home owner</td>
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<td>433</td>
<td>62.7</td>
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<td>Registered voter</td>
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<td>84.2</td>
<td>528</td>
<td>75.2</td>
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</tbody>
</table>

**STUDY 1**

**Method**

*Data Collection Procedures*

Residents of two municipalities in the northeastern United States were selected for inclusion in this study. One-quarter (n = 151) of the study participants were randomly selected from a list of community organization members. The remaining participants (n = 496) were randomly selected from an electronic telephone directory. All residences with phone numbers were selected as the population to be studied. A simple random sample was then selected from each of the municipalities. The survey was administered through telephone interviews lasting approximately 25 minutes.

**Sample**

A total of 647 randomly selected residents participated in the study (response rate = 61%). The sample was 65% African American, 19% white, 11% Hispanic. Sixty percent of the sample was female. See Table 1 for demographics.
Predictor Variables: Community Participation

Three community participation measures were used in a cluster analysis to create groups based on level of involvement in community organizations and activities.

Organizational membership. Organizational membership was assessed by asking participants to indicate whether they were members of community groups such as faith organizations, school/parent groups, and civic/community organizations. Thirty percent of residents were not members of any community organization, 36% were members of one organization, 34% were member of two or more (M = 1.0, SD = .80).

Organization participation. How often residents participated in organizations during the past 3 months is the second measure of community involvement. Respondents were asked to report how often they participated in each organization to which they belonged. Twenty-eight percent of respondents did not attend any meetings, 32% attended at least one meeting, and 41% attended more than one meeting (M = 1.1, SD = .82).

Individual civic participation. Individual civic participation consisted of eight items seeking an assessment of the frequency of community-action behaviors during a 3-month period (e.g., written letters to influence local policies, attended informational meeting). Respondents answered on a 4-point scale reflecting how often they engaged in each activity: 1 = not at all, 2 = at least once, 3 = 2 to 4 times, 4 = 5 or more times. These questions were added together to create one measure, ranging from 8 to 32 (Cronbach’s α = .88). To standardize the variables for the cluster analysis, the variable was divided into three categories: those who had not engaged in any activities at all (18%), those whose scores ranged between 1 and 8 (49%), and those whose scores were more than 8 (33%) (M = 1.2, SD = .71).

Criterion Variables: Empowerment

Intrapersonal empowerment. A shortened version of the Sociopolitical Control Scale (SPCS) or Intrapersonal Empowerment Scale was used to assess this component of psychological empowerment. Three items in the survey asked respondents to evaluate their leadership abilities and included specific issues such as the respondent’s tendency to be a leader in groups and his or her preference for leadership positions. These items were combined into one variable using the mean value of the three items (M = 2.7, SD = .85). A second dimension of intrapersonal empowerment is tapped through three items that asked respondents to report their perception of their own political efficacy. These included questions that asked respondents to evaluate their understanding of political issues and their competence to participate in political activity. An average value was calculated for these three items (M = 3.0, SD = .70).

Interactional empowerment. The measure of interactional empowerment developed for this survey was based on assessing a critical understanding of the forces that shape the environment in a community-organizing context. The 15-item scale, the Interactional Empowerment Scale (IES), was based on literatures in community organizing and sociology. The measure was composed of three dimensions that specifically targeted knowl-
edge of resources, causal agents, and critical awareness in mastering social and political systems in communities. One dimension was based on an understanding that the strength of interpersonal relationships is the source of power that undergirds noneconomic organizations (labeled power through relationship). An average of these items was calculated to create one measure of power through relationship (\( M = 3.7, SD = .52, \) Cronbach’s \( \alpha = .33 \)). A second dimension assessed an understanding of political rewards and punishments (political functioning). An average of these three items was calculated (\( M = 2.9, SD = .80, \) Cronbach’s \( \alpha = .69 \)). The third dimension assessed an awareness of the methods that powerful entities exercise to influence community interpretations and beliefs (labeled shaping ideology). Seven items were combined into a scale (\( M = 3.2, SD = .50, \) Cronbach’s \( \alpha = .62 \)).

**Data Analytic Procedure**

Data were analyzed in two stages. First, cluster analysis defined groups based on the community participation variables. Second, a MANCOVA was used to compare involvement groups on the five criterion variables.

**Results**

**Cluster Analysis**

A cluster analysis was conducted to classify individuals into groups based on the participation variables. Following previous research, Ward’s method was used to calculate the cluster solution.\(^{18,31}\) The cluster analysis revealed a three-cluster solution. The decision to use three clusters was made by evaluating the jump in proximity coefficients in the agglomeration schedule. A jump between the third and second cluster was larger than any other clusters. The same three-cluster solution was found within randomly selected subsamples. Overall, 97% of cases were classified in the same clusters in the original solution and the subsample solutions. Table 2 presents the means and standard deviations of the participation variables for the three clusters. Individuals in the first cluster, termed *low participation*, belonged to few organizations, attended few meetings, and participated less in community actions than the other two cluster groups. The second cluster included people with a medium amount of participation. People in the third cluster had the most organizational participation, more organizational memberships, and participated most in community activities.

**Demographics**

Demographic variables were related to community involvement. Middle-aged residents (aged 45 to 54) were more likely to be in the high-participation group, whereas younger residents were more likely to be in the low-participation group (\( \chi^2 = 34.1, p < .001 \)). Residents with higher incomes were more likely to be in the high-participation group, whereas lower income residents were more likely to be in the low-participation group (\( \chi^2 = 30.4, p < .001 \)). Gender was equally distributed across the participation clus-
African Americans were more likely to be in the high-participation cluster than other racial categories ($\chi^2 = 17.0, p < .05$).

Comparing Groups With Empowerment Dimensions

The strongest bivariate associations were between participation and political efficacy ($r = .25, p < .001$) and leadership competence ($r = .18, p < .001$). Multivariate analysis of covariance (MANCOVA), as shown in Table 3, was used to understand the differences between participation clusters and empowerment. Age, income, and ethnicity served as covariates. Results indicated that, controlling for demographics, statistically significant differences existed between participation clusters, Wilks’s lambda = .91; approximate $F(10, 970) = 5.0, p < .001$. Community residents who participate the most scored significantly higher on perceived leadership competence than community residents in both the medium- and low-participation clusters, $F(2, 489) = 8.94, p < .000$. In addition, community residents who participate the most scored significantly higher than the other two participation clusters on political efficacy, $F(2, 489) = 10.38, p < .001$. Respondents who participate the least scored significantly lower than the other two participation groups on understanding power through relationships, $F(2, 489) = 9.08, p < .001$.

Table 2. Descriptive Statistics for the Full Sample Cluster Solution

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Cluster 1 Low Participants</th>
<th>Cluster 2 Medium Participants</th>
<th>Cluster 3 High Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual civic participation</td>
<td>$M$</td>
<td>1.8</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>.63</td>
<td>.64</td>
</tr>
<tr>
<td>Organizational memberships</td>
<td>$M$</td>
<td>.30</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>.55</td>
<td>.50</td>
</tr>
<tr>
<td>Organizational participation</td>
<td>$M$</td>
<td>.07</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>.26</td>
<td>0</td>
</tr>
<tr>
<td>$N$</td>
<td></td>
<td>242</td>
<td>269</td>
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</table>

<table>
<thead>
<tr>
<th>Study 2</th>
<th>Cluster 1 Connected Participants</th>
<th>Cluster 2 Connected Nonparticipants</th>
<th>Cluster 3 Unconnected Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual civic participation</td>
<td>$M$</td>
<td>1.2</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>.64</td>
<td>.63</td>
</tr>
<tr>
<td>Sense of community</td>
<td>$M$</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
<td>.60</td>
<td>1.1</td>
</tr>
<tr>
<td>Organizational memberships</td>
<td>$M$</td>
<td>1.4</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
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<td>0.0</td>
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<tr>
<td>Organizational participation</td>
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<td>0.0</td>
</tr>
<tr>
<td></td>
<td>$SD$</td>
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<td>0.0</td>
</tr>
<tr>
<td>$N$</td>
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<td>307</td>
<td>222</td>
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Table 3. Multivariate Analysis of Covariance Comparing Cluster-Generated Groupings

<table>
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<tr>
<th>Variables</th>
<th>Study 1: Participation Clusters</th>
<th>Study 2: Social-Cohesion Clusters</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Low Participants (1)</td>
<td>Medium Participants (2)</td>
</tr>
<tr>
<td>Intrapersonal empowerment</td>
<td></td>
<td></td>
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<tr>
<td>Perceived competence</td>
<td>2.56</td>
<td>2.70</td>
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<td>Political efficacy</td>
<td>2.87</td>
<td>3.03</td>
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<tr>
<td>Interactional empowerment</td>
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<tr>
<td>Power through relationships</td>
<td>3.54</td>
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<td>Political functioning</td>
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<tr>
<td>Shaping ideology</td>
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<td>3.21</td>
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</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Connected Participants (1)</th>
<th>Connected Non-Participants (2)</th>
<th>Unconnected Participants (3)</th>
<th>Univariate F(2, 549)</th>
<th>Group Differences</th>
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<tr>
<td>Intrapersonal empowerment</td>
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<td></td>
<td></td>
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<tr>
<td>Perceived competence</td>
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<td>2.45</td>
<td>2.71</td>
<td>5.27**</td>
<td>2 &lt; 1, 3</td>
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<tr>
<td>Political efficacy</td>
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<td>2.89</td>
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<tr>
<td>Interactional empowerment</td>
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<td></td>
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<tr>
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<td>3.66</td>
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<tr>
<td>Political functioning</td>
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<td>3.46</td>
<td>3.09*</td>
<td>1 &lt; 3</td>
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<tr>
<td>Shaping ideology</td>
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<td>3.63</td>
<td>3.56</td>
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<td>Perceptions of community</td>
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<tr>
<td>Perceived institutional</td>
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<tr>
<td>involvement</td>
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<tr>
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<td>3.09</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.

STUDY 2

Method

Data Collection Procedures

Residents of three municipalities in the northeastern United States were selected for inclusion in this study. Using a telephone directory in electronic format, all residences with phone numbers were selected as the population to be studied. A simple random sample was then selected from each of the three municipalities. The survey was administered through telephone interviews lasting approximately 30 minutes.

Sample

A total of 707 randomly selected residents participated in the study (response rate = 56%). The sample was 81% white and 60% female (see Table 1).
Sense of community. A shortened version of a Sense of Community Index\(^\text{32}\) (four items on a 5-point Likert-type scale) was used to assess residents’ perceptions of how connected they feel to their community. As sense of community captures connectedness, an important component of social cohesion, this four-item scale was included in the cluster analysis. Items included were drawn from three subscales: one item represented reinforcement of needs, one item represented membership, and two items represented shared emotional connection. A mean score was calculated for each respondent (\(M = 3.3, SD = 1.1\)).

**Criterion Variables: Empowerment and Community Perceptions**

Intrapersonal empowerment, interactional empowerment. Intrapersonal empowerment was the same measure as in Study 1, including perceived competence (\(M = 2.6, SD = .85\)) and political efficacy (\(M = 2.9, SD = .71\)). In Study 2, the Interactional Empowerment Scale was slightly modified from Study 1 in an effort to improve reliabilities. Five items composed the Power Through Relationship Scale (\(M = 3.7, SD = .79\), Cronbach’s \(\alpha = .72\)). Five items composed the Political Functioning Scale (\(M = 3.4, SD = .86\), Cronbach’s \(\alpha = .79\)). Four items composed the Shaping Ideology Scale (\(M = 3.6, SD = .68\), Cronbach’s \(\alpha = .63\)).

Perceived involvement of institutions. Survey respondents were asked to rate the involvement of various institutions in the community (police, city government, churches, schools, and hospitals) in working with residents to improve the conditions in their communities. Respondents rated each institution on a 4-point Likert-type scale. Items were averaged to create one measure of perceived institutional involvement in the community (\(M = 3.0, SD = .67\), Cronbach’s \(\alpha = .78\)).
Social attributions. A series of questions in the survey asked respondents to agree or disagree with statements about social attributions of substance abuse. Items were averaged to create one measure of social attributions on which high scores reflected attributions to individuals (M = 3.1, SD = .73, Cronbach’s α = .58).

Data-Analytic Procedure

As with Study 1, data were analyzed in two stages. A cluster analysis defined groups based on the social cohesion variables, and a MANCOVA compared groups on the seven criterion variables.

Results

Cluster Analysis

Clusters were generated as described in Study 1. A three-cluster solution was generated and replicated within a randomly selected subsample. Overall, 93% of cases were classified in the same clusters in the original solution and the subsample solutions. Table 2 presents the means and standard deviations of the social cohesion variables for the three clusters. The first cluster, termed connected participants, included people who were the most connected in their communities. They belonged to more organizations, attended more meetings, participated in more community actions, and reported a higher sense of community than the other two cluster groups. The second cluster, termed connected nonparticipants, included people with the lowest organizational participation and a medium sense of community. The third cluster, termed unconnected participants, included people with strong amounts of organizational participation but who were lowest in sense of community.

Demographics

Several demographic variables were significantly related to community involvement. Chi-square statistics were used to determine if demographic characteristics are associated with cluster groups. Adjusted standardized residuals were analyzed to determine the cells with disproportionate numbers of residents. Older residents (age groups 45 to 54, 54 to 65, and 65 and older) were more likely to be connected participants. Younger residents (aged 18 to 24) were more likely to be connected nonparticipants. Residents aged 25 to 34 were more likely to be unconnected participants (χ² = 65.1, p < .001). Residents with higher incomes were more likely to be connected participants than those with lower incomes. Lower income residents were more likely to be connected nonparticipants than those with higher incomes (χ² = 26.1, p < .001). Lower income residents were slightly less likely to be unconnected participants; however, the adjusted standardized residual for the cell was not statistically significant. Women were more likely to be in the connected-participants cluster than men, men were more likely to be in the connected-nonparticipants cluster than women, and both genders were proportionately represented within the unconnected-participants cluster (χ² = 12.9, p < .01). Other racial categories were more likely to be in the connected-nonparticipants cluster and less likely to be in the connected-participants cluster than whites and African Americans. Ethnic groups were proportionately represented within the unconnected-participants cluster (χ² = 10.7, p < .05).
Comparing Groups on Empowerment Dimensions and Community Perceptions

A series of MANCOVAs (Tables 3 and 4) were used to understand how social-cohesion groups varied on empowerment and community perceptions. In each analysis, age, ethnicity, income, and education served as covariates. A one-way MANCOVA comparing social-cohesion groups derived from cluster analysis showed significant differences, Wilks’s lambda = .96, approximate $F(14, 1086) = 1.75, p < .05$. Connected participants and unconnected participants scored significantly higher than connected nonparticipants on perceived competence, $F(2, 549) = 5.27, p < .01$. In addition, unconnected participants scored significantly higher than connected participants on political functioning, $F(2, 549) = 3.09, p < .05$.

To further explore the relationship between social cohesion and the set of empowerment and community perception variables, an additional social-cohesion variable was computed to specify a fourth group (i.e., unconnected nonparticipants) that did not emerge from the cluster analysis. This social-cohesion variable was derived from median splits of connectedness and overall participation (computed as a mean of the three participation subscales). A one-way MANCOVA of the median split social-cohesion groups showed significant differences, Wilks’s lambda = .91, approximate $F(21, 1557) = 2.41, p < .001$. Unconnected nonparticipants scored significantly lower than all other groups on perceived competence, $F(3, 548) = 6.32, p < .001$, and significantly lower than connected participants and unconnected participants on political efficacy, $F(3, 548) = 2.97, p < .05$.

A final two-way MANCOVA, shown in Table 4, was performed to examine main effects of connectedness and participation on the set of empowerment and community perception variables. Results of this analysis showed statistically significant main effects for connectedness, Wilks’s lambda = .96, approximate $F(7, 542) = 2.94, p < .01$, and participation, Wilks’s lambda = .97, approximate $F(7, 542) = 2.31, p < .05$. Connected individuals scored significantly higher than unconnected individuals on two of the interactional-empowerment variables, including power through relationship, $F(1, 548) = 3.98, p < .05$, and shaping ideology, $F(1, 548) = 4.75, p < .05$; however, connected individuals scored significantly lower than unconnected individuals on understanding of political functioning, $F(1, 548) = 5.68, p < .05$. In addition, participants scored significantly higher than nonparticipants on intrapersonal-empowerment variables, including perceived competence, $F(1, 548) = 10.95, p < .01$, and political efficacy, $F(1, 548) = 5.11, p < .05$.

**DISCUSSION**

These studies present three important findings for empowerment theory and health education. First, Study 1 provides further support for existing empowerment theory by replicating and extending previous findings. Second, Study 2 found that by adding a qualitative element to the participatory measures, research participants were clustered into groups that differed by the connectedness of their participatory experiences. Third, Study 2 demonstrated the relationship between social cohesion and empowerment by showing that unconnected nonparticipants were lower in intrapersonal empowerment than other social-cohesion groups.
<table>
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*p < .05, **p < .01, ***p < .001.
Participation and Empowerment

Study 1 represents a strong confirmation of the relationship between participation and intrapersonal empowerment but also extends this line of inquiry to include interactional empowerment. Although the relationship between participation and intrapersonal empowerment has been produced in previous studies, this study added strength to previous findings by generating identical results with different data collection methods. Although rarely carried out, replications are important contributions. This study provided further support and confidence in the relationship between participation and intrapersonal empowerment, as well as the foundations of empowerment theory.

Study 1 also contributes to our understanding of the relationship between participation and empowerment by introducing a measure of interactional empowerment—a measure of how one perceives mechanisms by which environments and communities are shaped. Three dimensions of interactional empowerment were hypothesized, and one, power through relationships, was found to be significantly different for the participation groups. More important, the direction of these differences was consistent with empowerment theory.

The Cohesive Quality of the Participatory Experience

Findings presented also demonstrate the importance of the quality of the participatory experience—the cohesive nature of participation—in studying the phenomenon of community involvement. The cluster solution produced in Study 2 resulted in three groupings (i.e., connected participants, connected nonparticipants, and unconnected participants) based on the social-cohesion measures. More important, connected participants and unconnected participants were found to have comparable levels of participation, yet they differed in sense of community. These groupings suggest that regardless of the level of activity one sustains within his or her community, the connectedness that individuals have in relation to others differs in important ways. This finding is unique from other studies in that it identified a group with high participation and low sense of community who, nevertheless, possessed high empowerment. Although there were relatively few of these individuals, the result speaks to the importance of considering the role of social cohesion in empowerment. In sum, participation may need to be considered in combination with cohesiveness rather than unidimensionally.

Relationship Between Social Cohesion and Empowerment

Analysis of the median split groupings found that unconnected nonparticipants were lower in intrapersonal empowerment than other social-cohesion groups. This finding points to the deleterious effects of the combination of social isolation and lack of involvement. The crucial point for theory is that empowerment is most strongly differentiated by an extreme lack of social cohesion. When analyzed independently, findings suggest that participation may be more important than sense of community for intrapersonal empowerment, while sense of community may be more important than participation for interactional empowerment. This highlights the importance of scrutinizing factors that lead to different types of empowerment.
Limitations

Several limitations to these studies should be considered. First, telephone survey methodology has traditionally been criticized as biased against those without phones and unreliable when asking complicated or sensitive issues. Nevertheless, telephone surveys are increasingly used, the Census Bureau estimates 95% of U.S. households have phones, and results of comparisons between telephone and face-to-face interviews show negligible differences. More important, Study 1 replicated previous research using a different data collection method (telephone surveys rather than face-to-face interviews). The identical results in the two studies reduce methodological explanations of previous findings and support the robustness of the participation-empowerment relationship. A second, related limitation is the low response rate of the telephone surveys. The response rates, 61% and 56%, respectively, represent a limitation to this study as low response rates often underrepresent the most vulnerable portion of the population. The use of an electronic telephone directory as a sampling frame may have lowered response rates as electronic directories are more susceptible to being dated than, say, random digit dialing. Consequently, this may account for the fact that no unconnected nonparticipant group was identified in the cluster analysis. Although such a grouping is important for understanding the role of social cohesion and a conceptually derived group was generated, this sample may be limited by a lack of genuinely unconnected nonparticipants because of underrepresentation of the most mobile segment of the population within the sample. Third, the Study 1 sample was 65% African American, an overrepresentation for these two sampled communities based on the 1990 census. For the two populations sampled, however, random community residents were 62% African American, while organizational members were 76% African American. The proportion African American respondents from the community resident sampling is well within expected margins (4% and 6% greater than citywide rates based on the 1990 census for the two municipalities studied). Although the organizational members were almost three-quarters African American, community organizations are often more racially homogeneous than the communities in which they are embedded. Fourth, the organizational members of the samples in these studies varied from largely poor and minority to largely white and solidly middle class. Caution should be taken in generalizing findings, particularly to other settings and contexts. Fifth, not all measures were drawn from fully validated scales. The measure of interactional empowerment represents an initial attempt to measure the construct, and reliability for the Power Through Relationship Scale in Study 1 was particularly low. In addition, the measure of social cohesion was constructed on the basis of an approximation of conceptual models and preliminary measures. Although some groupings were derived empirically, future work on developing a measure of social cohesion is needed. Sixth, the cross-sectional design limits causal interpretation of the data. Together, these limitations require careful consideration, particularly when generalizing findings to other settings or populations.

In contrast, the limitations noted are balanced by the blending of probability sampling, triangulation of participatory measures, and use of a new measure for interactional empowerment. The limitations cited are also counterbalanced by the consistency of these findings with previous research studies and theory. Finally, our most potent conclusion with implications for empowerment theory is that rather than being considered
monolithically, the nature and quality of participatory experiences should be more carefully scrutinized, particularly in relation to empowerment.

**Implications for Practice**

Disempowerment, as a stressor negatively affecting health, is a condition that health education practitioners continue to counteract through interventions and education. This study adds to the knowledge base by supporting our understanding of participatory activities that lead to empowerment. Study 1 adds to the confidence with which health practitioners can facilitate empowerment by promoting participation for individuals. Our measures included numerous channels through which participation can be expressed, and each of these measures was positively associated with empowerment. For health education practitioners, strategies that cultivate opportunities for citizens to become members of organizations represent empowering interventions. Assisting in membership drives or distributing organizational materials may support increased participation. Likewise, efforts that encourage frequent and steady participation in organizational events represent empowering activities. Encouraging organizational participation may take the form of phone call reminders about organizational activities, organizing car pools for meetings, or assisting in the development of stimulating events (such as guest speakers) at organizational meetings. Finally, our analyses indicated that citizens acting independently to participate in community life had greater levels of individual empowerment. Practitioner efforts might include disseminating information about where citizens can write letters to city councilpersons or state legislators, encouraging local residents to attend the public meetings about community issues or directing advocacy groups to canvass neighborhoods to promote petition signing.

Together, these suggestions may be considered efforts for developing empowering organizations. Previous research has identified four organizational characteristics as empowering for individuals: development of active leadership, numerous opportunities for members to take on a variety of participatory roles, social support among group members, and a shared set of beliefs that provides a rationale for the group’s actions.

More important, these characteristics of empowering organizations dovetail with the focus of Study 2, social cohesion. A focus on participation within organizational and community contexts allows not only for opportunities to enhance empowerment but to support a sense of community or the connections between individuals so that a collective sense of trust, investment, and action can be developed. One strategy available to health educators to enhance social cohesion involves use of a narrative approach, whereby members are encouraged to express personal, organizational, and community stories in collective contexts that create shared purpose and identity. Another involves encouragement of neighboring behaviors, such as food and tool-sharing cooperatives, which can increase length of time people remain organizational members, live in communities, and can expand personal networks of neighbors whom they can identify by first name; factors found to be important in the development of sense of community. Yet another strategy involves development of clear organizational and community rules and norms that facilitate a sense of order necessary for members to commit to organizations and communities. Finally, social cohesion can be enhanced by health educators through efforts to develop social support systems, which include demonstration of affection, provision
of child care, or communicating opinions or facts. These strategies can enhance empowerment and social cohesion, thus potentially limiting exposure to risk factors, improving coping responses, and consequently attenuating the deleterious effects of stress on health.

References

Impact Study of Tobacco Possession Law Enforcement in Florida

William C. Livingood, PhD
Carolyn D. Woodhouse, EdD, MPH
Judy Jopling Sayre, MAJC
Peter Wludyka, PhD

This study of tobacco possession law enforcement was conducted in four selected counties in Florida, the first state to report statistically significant annual declines in youth tobacco use during the 1990s. The primary objective of this study was to assess the impact of possession enforcement on youth attitudes, perceptions, and behaviors by comparing results of a survey administered in high-enforcement counties with results from low-enforcement counties and by examining the survey results for relationships of tobacco use to perceptions and awareness of laws and enforcement activity. The survey was administered to a sample of 2,088 randomly selected youth, in conjunction with a qualitative study of law enforcement officials reported elsewhere. Findings indicate that possession enforcement, as a component of comprehensive tobacco control, appears to help reduce youth tobacco use and may be a critical component of the most successful youth tobacco prevention program, documented in the previous decade.

Tobacco use among children continues to be a major public health problem despite continued recognition that tobacco is the single leading cause of death, and despite major achievements in reducing adult tobacco use. Recent success in reducing tobacco use in Florida provides the most dramatic reversal in a decade-long period of increasing use of tobacco by adolescents.

As greater emphasis is placed on social change and population-based approaches to prevent and control tobacco use, a comprehensive, multifaceted approach appears to be the reason for reductions in youth tobacco use in Florida. However, little has been reported about what components of a comprehensive program might be important for overall success. For example, many states have different approaches to the use of laws to curtail tobacco use. All states have laws restricting sales and distribution to minors, but the impact of the various laws or enforcement of the laws on youth tobacco use is incon-

William C. Livingood and Carolyn D. Woodhouse, Duval County Health Department, Jacksonville, East Stroudsburg University of Pennsylvania. Judy Jopling Sayre, Duval County Health Department, University of North Florida, Jacksonville. Peter Wludyka, University of North Florida, Jacksonville.

Address reprint requests to William C Livingood, NGAGE, Inc., Ponte Vedra Beach, FL 32082: phone: (904) 272-2480, fax: (904) 273-1680; email: William_Livingood@doh.state.fl.us.

This evaluation research was funded by a grant from the Florida Department of Health, Office of Tobacco Control, administered through the University of Miami. The project was conducted by NGAGE, Inc. and the Duval County Health Department. The authors particularly recognize Lt. Tania Pendarakis, Florida Division of Alcoholic Beverages and Tobacco, and Dr. Ursula Bauer, Florida Department of Health, for their support and assistance in conducting this research. The authors also recognize the county-level Department of Health coordinators and school officials whose support and assistance were essential for this project.

Health Education & Behavior, Vol. 28 (6): 733-748 (December 2001)
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Increasingly, states have been adopting laws prohibiting possession, but recommendations for comprehensive programs do not address the use of possession laws. The most recent surgeon general’s report on tobacco does discuss possession enforcement within the chapter on “Regulatory Efforts,” summarizing the pros and cons as the deterrent effect versus the difficulty with enforcement. Although the report cites literature that examines the controversies of criminalizing and revictimizing youth versus the need for consistent social messages, the report does not cite data-based research studies related to possession enforcement, thereby underscoring the need for research in this area.

Florida’s comprehensive program, developed initially under the direction of the governor’s office, includes (1) marketing and communication initiatives, (2) youth leadership and community partnerships, (3) education and training, (4) enforcement, and (5) evaluation and research. The enforcement component supports efforts by a state agency and local agencies to encourage compliance with Florida’s tobacco products law that provides criminal penalties for retail clerks who sell tobacco products to underage youth. This law also provides for noncriminal penalties (progressive for multiple violations, from a $25 fine to loss of one’s driver’s license) for purchase, possession, or use of tobacco by underage youth. The primary focus of the possession enforcement efforts has been on areas in close proximity to schools, supported extensively through the state Division of Alcoholic Beverages and Tobacco (DABT) contracts with local enforcement agencies. As many states debate the use of settlement funds, and with Florida’s dramatic success in reducing youth tobacco use, insight about what programs might contribute to reducing youth tobacco use are particularly important.

The purpose of this study was to assess the impact of Florida’s law governing possession of tobacco by youth on youths’ attitudes, perceptions, and behaviors. Impact was assessed by comparing youth tobacco use between low-enforcement counties and high-enforcement counties in Florida and by examining the relationship of youth attitudes, awareness, perceptions, and projections to tobacco use. The focus of this study was on the impact on the general population of youth who may have been influenced by exposure to enforcement through media, personal contact with the punished offenders, or even through informal means such as rumors. This study did not attempt to assess the impact on those who were cited for tobacco possession. The rationale for this study was that only a very small percentage of youth were actually cited for tobacco possession, but law enforcement as a health promotion strategy should have a much greater social value through its ability to dissuade youth in general from engaging in the illegal behavior.

**METHOD**

This overall research effort, which included this study, employed a mixed-method design to answer research questions concerning the impact of law enforcement on youth tobacco use. A qualitative study was conducted as part of the larger research effort on possession enforcement to further clarify the context of the study of youth attitudes and behaviors being reported here. The qualitative study involved a purposeful sample of law enforcement leaders whose selection was based on local involvement with enforcement of Florida’s tobacco possession law. The qualitative study of law enforcement leaders provided critical insights into the context of law enforcement for the communities that were studied and established that differences in law enforcement were evident in the contrasted counties (although these were not as stark as the preliminary data indicated).
Because of the complexity of designs and findings for both studies, the method and findings that follow are limited to the survey of youth concerning tobacco-related behaviors, attitudes, and perceptions.

**Measures**

Data collection for the youth was conducted through a modified version of the Florida Youth Tobacco Survey (FYTS),\(^{10,11}\) a closed-ended questionnaire completed by a random sample of children in Grades 6 through 12 throughout Florida. The FYTS was designed for a representative sample of the state and contained very few questions related to enforcement. The survey used for this study was designed to obtain more detailed information about attitudes and perceptions related to enforcement and was to be used with representative samples from the counties identified to be high and low enforcement.

Items were deleted from the FYTS instrument (22 from the middle school survey and 33 from the high school survey), and items were added for this study to measure awareness of enforcement activities in the community, perceived risk and threat associated with citations and penalties, projected impact on behavior, and the extent that the laws and penalties concerning youth possession of tobacco are being taught in the schools. The 62-item high school survey and 53-item middle school survey were administered during the months of March through May 1999, starting approximately 1 month after 1999 FYTS data collection was completed. The primary item related to tobacco use was retained from the FYTS. It asked the question, “During the past 30 days, on how many days did you smoke cigarettes?” with closed-ended responses ranging from *I did not smoke cigarettes during the past 30 days* to *all 30 days*. Other items contained questions concerning how many cigarettes per day and questions related to cigars and chewing tobacco, snuff, or dip.

Items retained from the FYTS that were particularly important to this study were questions reflective of attitudes or beliefs about tobacco use, such as “Do you think young people who smoke have more friends?” or “Do you think smoking cigarettes makes young people look cool or fit in?” or “Do you think people can get addicted to cigarette smoking just like they can get addicted to cocaine or heroin?” Closed-ended responses ranged from *definitely yes* to *definitely not*, with *probably yes* or *probably not* as intermediate alternatives. The high school survey also included two projected behavior items related to smoking: “any time during the next year” and “5 years from now.” These items were grouped as “unhealthful attitudes.”

Four questions related to the content of tobacco education were retained from the FYTS. The questions asked, “During this school year, were you taught in any of your classes about specific subjects including tobacco use, reasons why people your age smoke, the effects such as yellow teeth and bad smell, and causes cancer and heart disease?” Responses were limited to *yes*, *no*, and *not sure*. Two additional items were added to the subjects being taught, laws concerning possession and penalties for use including fines or loss of driver’s license. The six items were grouped as “taught in school.” Related to education programs, students were also asked who would be most effective to teach about laws concerning possession of tobacco.

Questions added to the FYTS battery of items related to self-projected use and perceived use by others as influenced by the threat of enforcement-related penalties contained the same range of responses as the previously described unhealthful-attitudes measures, ranging from *definitely yes* to *definitely not*. The questions asked, “Do you think that you would be less likely to use tobacco?” or “Do you think that other people your age...
would be less likely to use tobacco because of possible penalties for breaking the tobacco possession law?” Similar questions for self-reported projections and perceived use by others were asked related to smoking close to schools. These items were grouped as “perceived impact.”

Another group of added items asked questions related to awareness of the law and enforcement activities. Separate questions were asked related to anyone receiving a citation, going to court, being fined, or being sentenced to community service. Five levels of response were provided as alternatives from No to Yes—1 person, Yes—2 people, Yes—3 people, and Yes—4 or more people. Other questions with yes, no, not sure response options asked if Florida has a law that punishes anyone younger than 18 for possession of tobacco and if Florida law has a suspended driver’s license penalty if caught with tobacco when younger than 18. These items were grouped as “awareness of enforcement.”

Sample

The counties for this study were selected based on the law enforcement activity determined by the number of citations issued, using a previously conducted statewide random survey of law enforcement officers throughout Florida and the DABT records for “number of arrests.” Four counties with the highest levels of enforcement were selected: Volusia, Polk, Suwannee, and Broward. Marion and Citrus Counties, two of the three counties with lowest levels of enforcement, were selected as controls. Marion and Citrus Counties had no law enforcement officer reporting citations being issued during the statewide survey, whereas Polk and Volusia had 42% and 25%, respectively. Prior to this study, DABT records showed only 1 citation issued in Citrus and 5 issued in Marion, whereas Polk and Volusia had 110 and 233 citations, respectively. Adjusting for population size, the preliminary data for the low-enforcement counties indicated one-twentieth the rate of citations of the high-enforcement counties. It should be noted that data from the court clerks obtained during the ethnographic study indicated that low-enforcement counties had about one-half the rate of citations of the high-enforcement counties. Related to level of enforcement, neither Citrus nor Marion local enforcement agencies had contracts with the state DABT to conduct school proximity enforcement activities.

Some of the selected counties were very different demographically. In particular, Broward is a highly populated county in the southern part of the state with relatively high per capita income. Suwannee is a very rural northern county with a lower per capita income and other demographics associated with lower socioeconomic status. To reduce the potential confounding effects of socioeconomic and geographic variables, the primary comparison counties for the main effect of concern to this study were counties in the more central part of the state with similar per capita income (Citrus, Marion, Polk, and Volusia), although all six counties were examined to meet the research contract requirements. Table 1 contains the comparative demographic information for the counties.

The sampling process used for the youth survey primarily involved a random cluster–stratified cluster technique, with the schools (clusters) being selected randomly within each county followed by stratification of the classes (clusters) according to grade level. Since Suwannee was such a small county with only two schools at the middle school and high school levels, additional stratification of the two schools was conducted.

Classrooms (clusters) within each school at each grade level were selected randomly. County coordinators, who also were responsible for coordinating the FYTS, coordinated implementation of this survey at the county level. County coordinators were trained for implementation of the FYTS and were provided directions similar to the directions for the
FYTS for selection of the specific classes for this study. The process involved assigning numbers to each class and the use of a list of random numbers for selection of the specific classes.

Analysis

Cross-tabulation analyses (chi-square tests) were performed using the Statistical Package for the Social Sciences (SPSS). Descriptive data were presented in Excel charts, which with the chi-square tests were used to interpret the data. These cross-tabulation analyses were performed on each item in the survey for each of the demographics, for the aggregated high/low-enforcement comparison counties, and for responses to selected items for each question on the survey. Confidence intervals for tobacco use between the comparison counties were constructed using large sample methods. Statistical Analysis System (SAS) was used to conduct multivariate analysis including Cronbach’s alphas and factor analysis. SAS was also used to correlate nonuse of tobacco with various constructs confirmed through factor analysis.

Additional analysis was conducted for potential confounding variables in response to questions raised by state officials and CDC officials. In particular, logistic regression analysis was conducted for the relationships of ethnicity, gender, grade level, and enforcement to cigarette use. Additional data were obtained and analyzed related to retail sales enforcement in the comparison counties. Analysis was also conducted to assess the homogeneity effect associated with clustering since SUDAAN-type analysis was not conducted. A comparison of the standard deviations at each grade level between each county and the schools within each county indicates that the clustering effect of homogeneity was not likely to be substantial since 42 individual schools had larger standard deviations than the whole county standard deviations in contrast to 35 schools with lower standard deviations than the whole county standard deviations. Analytic software such as SUDAAN, which is used to adjust for homogeneity associated with clustering, was not included in the data analysis for the following reasons: (1) the need for complex supplementary calculations to adjust for the small number of clusters possible within many of the counties; (2) the possibility of treatment effects, which can also cause homogeneity; and (3) p values were larger than the size of p values that the literature indicates are affected by adjustments due to clustering.

Reliability of the modified FYTS instrument was established using post hoc SAS application of the Cronbach alpha multivariate statistical analysis. Four constructs and related questions were analyzed: (1) taught in school about tobacco, (2) unhealthful attitudes about tobacco, (3) projected/perceived impact of possession law, and (4) awareness
of tobacco enforcement. Separate Cronbach analysis was conducted on high school data and middle school data due to different items in the high school and middle school surveys. Alpha values for all four constructs were relatively high for both the high school and middle school surveys, ranging from .70 to .91 (alphas greater than .90 are not highly desirable since the items are designed to measure related but different phenomena; total redundancy is not desired).

Exploratory factor analysis using SAS was conducted separately for the high school and middle school data. When factor analysis—a multivariate procedure for using the various configurations of the data to identify underlying relationships or “latent” variables—confirms predicted constructs, some evaluation experts maintain that it establishes construct validity. Four meaningful factors for both the high school and middle school surveys were identified, accounting for more than 99% of the common variance. The four factors that emerged correspond to the survey items and constructs identified for both the middle school (MS) and high school (HS) survey Cronbach alpha analysis: (1) taught in school (HS $r^2 = .94$, MS $r^2 = .90$), (2) unhealthful attitudes (HS $r^2 = .91$, MS $r^2 = .68$), (3) perceived/projected impact (HS $r^2 = .77$, MS $r^2 = .72$), and (4) awareness of enforcement activity (HS $r^2 = .82$, MS $r^2 = .87$). The factor analysis clearly confirmed the predicted constructs, establishing a form of construct validity for the two instruments.

**RESULTS**

The overall study included data from 4,163 students, and the data from the counties compared to assess the main effect included 2,088 students, 948 from the low-enforcement counties (Citrus and Marion) and 1,140 from the high-enforcement counties (Polk and Volusia). The numbers for female students and male students were comparable for the whole sample, with 49.8% of those surveyed being male and 50.2% being female. The racial/ethnic composition of the survey participants was predominantly white, but large numbers of minorities participated in the survey. In particular, students identifying themselves as black or African American comprised 20.8% of survey participants included in this study, and those identifying themselves as Hispanic or Latino comprised 13.9% of the survey participants. Much smaller percentages of students indicated the other minority categories: American Indian or Native Alaskan, Asian and Native Hawaiian, or other Pacific Islander.

Use of tobacco products was similar for this Law Enforcement Impact Study (LEIS) population compared to the 1999 Florida FYTS statewide results. High school students used all products more than middle school students in both surveys. Cigarette use was almost identical in middle schools for both the LEIS and the FYTS. Cigarette use in high schools was slightly higher for this LEIS. Other forms of tobacco use were similar but somewhat higher for the LEIS (Table 2 contrasts the specific percentages for the different types of tobacco use for the two studies).

Use of cigarettes was highest in the two control (lower enforcement) counties. The cigarette use rate in the past 30 days in Marion was 29.2%, and the rate in Citrus was 28.1%. All four other counties in the study had lower cigarette use rates, with Volusia at 21%, Suwannee at 23.2%, Broward at 13.9%, and Polk at 26.6% (Suwannee and Broward data were analyzed to complete contractual requirements but were not relevant for most of the findings of this study; if they had been used, they would have exaggerated the observed effect). Aggregated difference in cigarette use between the demographically similar counties of Citrus and Marion compared with Polk and Volusia was statistically signifi-
cant. Additional analysis confirmed that cigarette use rates at both the high school and middle school were similarly lower in the higher enforcement counties compared with the lower enforcement counties, dispelling concerns that the observed differences in tobacco use between the comparison counties might have been due to disproportionate distribution of the younger (middle school) students. Table 3 contains the tobacco use rates for the aggregated comparison groups with 95% confidence intervals.

Data on potential confounding variables were examined for the comparison counties. Variations in enforcement of laws governing sales to youth may influence youth tobacco use, potentially confounding the observed effect. Analysis of the interviews of law enforcement leaders in each of the counties indicated unequivocal support for enforcement of the law restricting sales to youth. Florida also consistently reports very high Synar compliance rates. Furthermore, an unpublished technical report, *Meta-Analysis of the Community/Opinion Leaders*, describing a study of community leaders conducted 1 year prior to this study, indicates that the community leaders across the regions involved with this study were overwhelmingly (98% to 100%) in support of fining storeowners who were caught selling tobacco products to youth in contrast to substantial disagreement among community leaders about fining youth.

Data on compliance checks for retail merchants obtained from the DABT indicates that for 1998 (the year immediately preceding data collection), the two high-possession enforcement counties had the lowest and highest rates of citing retailers (% of arrests) for selling tobacco to youth per compliance check (range of 8.5% to 16.5%) compared with the low-possession enforcement counties (range of 9.3% to 9.9%). The aggregated retail sales compliance rates for the low-possession enforcement counties were higher (91.5%) than those for the high-possession enforcement counties (86.6%), providing contradictory evidence of reduced access due to sales enforcement being a cause for the observed differences in tobacco use. Complementing the retail sales compliance rates, this survey revealed that students who smoked in the low-possession enforcement counties purchased cigarettes from stores at much lower rates (31%) than students in the high-possession enforcement counties (42%).

Related to gender as a potential confounding variable, the overall sample had very similar proportions of women and men (within four-tenths of 1%). Tobacco use rates among men and women for this study were also very consistent. Difference in genders between the aggregated comparison counties was less than 1%.

Since the proportion of black and white respondents was unevenly distributed among the comparison counties and since tobacco use has varied extensively among races, ethnicity of respondents represents another potential confounding variable. The main effect (differences in youth cigarette use) was very clearly observed between the high- and low-enforcement counties within both the white and black populations. In fact, the effect (reduced cigarette use by youth) due to law enforcement was most pronounced with those identifying themselves as black or African American. Blacks in the high-enforcement

<table>
<thead>
<tr>
<th></th>
<th>Cigarette Use</th>
<th>Chew Use</th>
<th>Cigar Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FYTS LEIS</td>
<td>FYTS LEIS</td>
<td>FYTS LEIS</td>
</tr>
<tr>
<td>Middle school</td>
<td>15 15.5</td>
<td>4.9 7</td>
<td>11.9 12.1</td>
</tr>
<tr>
<td>High school</td>
<td>25.2 28.1</td>
<td>6.4 10</td>
<td>19.5 22</td>
</tr>
</tbody>
</table>

Table 2. Comparison of Law Enforcement Impact Study (LEIS) Tobacco Use With Florida Youth Tobacco Survey (FYTS) (in percentages)
counties (Polk/Volusia sample, 16% black) were much less likely (7.6%) to use cigarettes in comparison to the low-enforcement counties (Citrus/Marion sample, 11% black), where 19% reported cigarette use in the past 30 days. The pattern of use (27.9%) in the high-enforcement cohort (Polk/Volusia sample, 72% white) was also lower than use (30.6%) with those identifying themselves as white in the low-enforcement cohort (Citrus/Marion sample, 80% white).

Logistic regression analysis confirmed that ethnicity affected tobacco use in this study population, complementing the previously cited research (see Table 4). Both ethnicity and grade level were shown to be more predictive of tobacco use than possession enforcement through logistic regression analysis. More important, the observed differences in youth tobacco use between the low-enforcement counties and high-enforcement counties were not due to disproportionate ethnic composition of the counties, disproportionate representation of lower-tobacco-using blacks versus higher-tobacco-using whites. To the contrary, the differences in tobacco use between the high-enforcement and low-enforcement counties were attributed to both ethnic groups being affected, but by blacks being particularly affected by high enforcement.

Another potential confounding influence was variation in the communities’ attitudes about tobacco use as might be reflected in the attitudes of the youth. Responses to two of the three attitude questions on the high school and middle school surveys were very similar for the comparison counties, with 69% from both comparison counties “definitely” agreeing that cigarettes are addictive, and with 5% from both comparison counties “definitely” agreeing that people who smoke have more friends. A statistical difference ($p = .024$) between the comparison groups was observed for the question concerning cigarettes making people look cool, with 4% “definitely” and 9% “probably” agreeing from the low-enforcement counties and 5% “definitely” and 6% “probably” agreeing from the high-enforcement counties. Differences in response patterns for the question “Have your

Table 3. Aggregated Comparisons of Tobacco Use in Past 30 Days (in percentages)

<table>
<thead>
<tr>
<th>Level</th>
<th>95% Confidence Interval Range—Polk/Volusia</th>
<th>95% Confidence Interval Range—Citrus/Marion</th>
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</thead>
<tbody>
<tr>
<td>Middle school</td>
<td>15.7</td>
<td>19.9</td>
</tr>
<tr>
<td>High school</td>
<td>30.8</td>
<td>35.3</td>
</tr>
<tr>
<td>Combined middle school/high school</td>
<td>23.4</td>
<td>28.5</td>
</tr>
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</table>

Table 4. Analysis of Maximum Likelihood Estimates

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>p &gt; Chi-Square</th>
<th>Standardized Estimate</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1</td>
<td>-1.4855</td>
<td>0.1148</td>
<td>167.3933</td>
<td>0.0001</td>
<td>-0.207425</td>
<td>0.335</td>
</tr>
<tr>
<td>Black</td>
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<td>0.1974</td>
<td>30.6907</td>
<td>0.0001</td>
<td>-0.2044</td>
<td>0.335</td>
</tr>
<tr>
<td>High enforcement</td>
<td>1</td>
<td>-0.2044</td>
<td>0.1041</td>
<td>3.8518</td>
<td>0.0497</td>
<td>-0.056131</td>
<td>0.815</td>
</tr>
<tr>
<td>Grade</td>
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<td>0.2137</td>
<td>0.0268</td>
<td>63.8201</td>
<td>0.0001</td>
<td>0.232617</td>
<td>1.238</td>
</tr>
</tbody>
</table>
parents ever told you not to smoke cigarettes?” were not statistically significant. Even with the statistical significance for the “looks cool” item, the response patterns for these items that may reflect community values were remarkably similar for the comparison counties, whereas they are clearly different for other key items.

Variation in community attitudes and behaviors about tobacco control also were examined through the University of Miami data on community partnerships. These data were inconclusive as all comparison counties were rated average or high related to community partnerships, and the average and high counties had very similar youth tobacco use patterns, in contrast to the low-performing counties, which had higher youth tobacco use rates.

**Triangulation Related to Awareness of the Law and Enforcement Activity**

In general, students were relatively unaware of the potential penalties as indicated by responses to a question about their license being suspended and responses to a question about being fined for being caught using tobacco. Students in the counties with lower enforcement were less aware that their license could be suspended for being caught using cigarettes than students in the higher enforcement counties. Only 37% of students in Citrus/Marion were aware compared with 45.3% in Polk/Volusia ($p = .003$). The percentage of students in Polk/Volusia indicating they would be fined if caught using tobacco was much higher (49.2%) compared with Citrus/Marion (37.7%) ($p \leq .001$). A majority of students in the study were aware of the law concerning underage possession, but the Polk/Volusia students had much higher awareness (67%) than Citrus/Marion students (57%) ($p < .001$). Students in Citrus/Marion were also less likely (12%) to know someone who was fined than students (18%, $p = .019$) in Polk/Volusia, and less likely (21%) to know someone who received a citation than students (30%, $p = .001$) in Polk/Volusia. Awareness of the penalties, people being cited, or people being punished for possession would be critical for enforcement to have caused the effect (reduced tobacco use). It would not be reasonable to conclude that the differences in tobacco use were due to enforcement without differences in levels of awareness. These consistent findings between awareness and the observed effect (tobacco use) were critical for triangulation.

**Triangulation Related to Perceived Impact**

Students in the high-enforcement (Polk/Volusia) counties indicated that others would definitely or probably be less likely to use tobacco because of penalties at a higher rate (39%) than students in the low-enforcement (Citrus/Marion) counties (31.5%, $p < .001$). In general, higher percentages of students indicated that others would be less likely to use tobacco close to schools. Student perceptions of law enforcement’s impact on other students were also consistent with county differences in enforcement. Students in the lower enforcement counties were less likely (45.7%) to indicate penalties would have an impact on tobacco use close to schools than students from the higher enforcement counties (49.5%, $p < .001$).

**Triangulation Related to Identified Constructs**

Most of the correlations between nonuse (zero days of use) of cigarettes and the various constructs identified through factor analysis were significant with $p$ values below
The constructs were more highly correlated with nonuse of tobacco at the middle school level than the high school level; the construct “taught in school” was not significantly correlated at the high school level. The law enforcement–related constructs, “perceived/projected impact” (middle school $r = .32, p = .0001$; high school $r = .22, p = .0001$) and “awareness of enforcement” (middle school $r = .33, p = .0001$; high school $r = .14, p = .0001$) were positively correlated with nonuse. Unhealthful attitudes had the largest (albeit negative) correlation (middle school $r = -.56, p = .0001$; high school $r = -.75, p = .0001$) with tobacco nonuse.

Although the education construct was not significantly correlated with tobacco use, students who were taught about the penalties had lower cigarette use rates (23%) compared with those (28%) who were not taught ($p = .039$). Students who were taught about the penalties also projected they would be less likely to use tobacco due to penalties at a higher rate (59%) than those (46%) who were not taught ($p \leq .001$). Related to being taught about enforcement in schools, more students (60%) were taught about the health aspects of tobacco than the enforcement aspects (44%). In response to who would be the most effective to teach people in their grade about tobacco, 33.3% of students indicated a police officer, 25.5% a health teacher, 9.7% a nurse, and 4.1% a counselor ($p = .013$).

**Impact on Younger Students**

The law governing possession of tobacco by youth appears to affect younger students more than older students. Most (64.2%) middle school students projected that they would definitely or probably be less likely to use tobacco because of possible penalties, in contrast to the high school student rate (42.4%, $p \leq .001$). Middle school students also perceived that other students would be less likely to use tobacco because of possible penalties (46.9%, definitely or probably). A relatively small but substantial rate (26.5%) of high school students thought students would be less likely to use tobacco in general ($p \leq .001$).

The projected and perceived impact was much greater close to schools, with younger students being more affected than older students ($p$ values $\leq .001$). Although the majority of both high school and middle school students projected that they would definitely or probably not use tobacco close to school because of penalties, the middle school response rate (66.4%) was higher than the high school rate (57.5%). The majority of middle school students (56.9%) also perceived that other students would be less likely to use tobacco close to school due to possible penalties, and a smaller but substantial proportion (40.7%) of high school students perceived that others would be less likely to use tobacco close to school. Interestingly, middle school students were more likely to know someone who had to go to court, someone who was fined, and someone who was sentenced to community service, with only the differences related to a sentence to community service being statistically significant ($p \leq .001$).

The impact on younger smokers was reinforced by data for less frequent smokers. Students who smoked one or fewer cigarettes per day were much more likely (48.9%) to agree that they would be less likely to use because of penalties than the students who smoked two or more per day. In contrast, 23% of those who smoked two or more cigarettes per day agreed that they would be less likely to smoke due to possible penalties. Only 18% of those who smoked earlier on the day of the survey indicated that they would be less likely to smoke because of penalties.
DISCUSSION

The results of this study provide evidence that law enforcement can affect the use of tobacco by youth. Despite extensive efforts to control for and analyze for confounding variables, the lack of randomized assignment of treatments (varying levels of enforcement) may be considered a limitation of this study as randomized assignment is the only method to control for all possible confounding variables. The research design of this study does not preclude an unknown preexisting condition from having caused the observed effect, which randomized assignment would have more effectively addressed. However, randomized assignment not only requires communities to be ambivalent about accepting or not accepting a controversial intervention at the roll of the dice but it requires a relatively simple, replicable intervention. The qualitative study complementing this study and the statewide survey of officers preceding this study both indicated that enforcement involves a wide range of somewhat independent players including chief enforcement officers, rank-and-file officers, judges, court clerks, and states attorneys, thereby creating many possible variations in enforcement. Rather than a limitation, the use of alternative research designs is recommended by evaluation experts from qualitative authorities, such as Patton, to established quantitative authorities, such as the National Science Foundation, to evaluate complex social interventions such as the subject of this impact evaluation. Emphasis is on understanding the complexity rather than on trying to define a single, simple intervention that can be tested in laboratory-type communities.

Triangulation is an important construct for these alternative designs as triangulation enhances confidence in the findings. Multiple types of data were used for this study confirming the impact of law enforcement on youth tobacco use and providing extensive triangulation of results. The triangulated findings include the following:

1. The higher enforcement counties had lower tobacco use than the lower enforcement counties. Data indicate that probable confounding variables were unlikely to have caused the differences in tobacco use that were observed between the high-enforcement counties and the low-enforcement counties.
2. Large percentages of students project that they are less likely to use tobacco because of the possible penalties, particularly around schools. Many students perceive that other students would be less likely to use tobacco because of penalties, particularly around schools. Patterns of projected impact and perceived impact correspond to the patterns of tobacco use within the comparison counties. Awareness of penalties and enforcement activity also corresponds to the patterns of tobacco use within the comparison counties. These data help confirm levels of enforcement and provide additional triangulation for the impact of enforcement on youth tobacco use. Awareness of penalties and of enforcement activity also directly relates to perceived threat or susceptibility, a major construct for health-related behavior change theory.
3. Nonuse of tobacco was significantly correlated with constructs associated with enforcement (perceived/projected impact of enforcement and awareness of enforcement). The more students were aware of enforcement activities and the more they perceived/projected that law enforcement was a deterrent to tobacco
use, the less likely they were to smoke. A California study\textsuperscript{45} of youth found that youth awareness of laws was greatest for tobacco users. However, California’s laws relate more to access to products and places for smoking, laws that may make smoking more difficult. Laws that discourage or penalize tobacco use by youth may have very different relationships to youth tobacco use, as was demonstrated with this Florida study.

The potential for law enforcement to discourage tobacco use in younger, less frequent tobacco users and to reduce role modeling in locations frequented by younger children may have the most profound implications for reducing the epidemic of youth tobacco use. Data indicate that the potential impact of enforcing laws is greatest for younger children (middle school students) and for those who are exploring with occasional use (one or less per day). The most recent FYTS data released by the Florida Office of Tobacco Control\textsuperscript{46} for surveys conducted in December 1999 indicate 40% reductions in middle school tobacco use (from 18.5% to 11.1% in less than 2 years), a major change in tobacco use that is very consistent with data in this study, further indicating that younger children are more likely to be affected. The perceived effect of enforcement being most effective in the areas where it is being targeted (around schools) provided additional confirmation that law enforcement is effective. Reduced tobacco use close to schools where enforcement was targeted is consistent with the overall effect of reduced youth tobacco use, provides additional triangulation of the findings, and has important implications for reduced role modeling in high-visibility locations. The observed difference in tobacco use between the high- and low-enforcement counties may have been due to the reduced role modeling and learning through imitation (a major health-related behavior change construct)\textsuperscript{47,48} associated with enforcement in high-visibility locations in close proximity to schools. However, the data appear to confirm the need for law enforcement to be part of a comprehensive program, as the $r$ values for enforcement-related constructs were relatively small compared to the unhealthful-attitudes construct in predicting tobacco use. Enforcement does not appear to be the single answer to reducing youth tobacco use; it should be used in conjunction with a comprehensive program.

This study also indicates that teaching about law enforcement is not given as high a priority as teaching about health issues associated with tobacco use. It is unlikely that law enforcement can have an impact on student use of tobacco unless students are aware of the legal ramifications. Efforts may be needed in Florida and other states to enhance the law enforcement component of school curricula concerning tobacco use.

This study reflects some of the only data-based research on the subject, but it cannot be considered definitive. Enforcement is a very complex intervention, with all kinds of potential variations. Enforcement in this case was conducted within the context of a very extensive comprehensive tobacco program. Other studies with heavy emphasis on the context of enforcement are clearly required for conclusive findings. Results should not be generalized, if any generalization is warranted at all, beyond this particular type of enforcement within the context of a similar comprehensive tobacco control program.

**Implications for Practitioners**

The need for a multifaceted approach including programs that target youth attitudes is particularly critical in light of recent research indicating that some states are primarily relying on “punishment” as a means of reducing youth tobacco use.\textsuperscript{49} Considerable research indicates that law enforcement provides an effective behavior change strategy...
related to motor vehicle occupant restraints.\textsuperscript{50-52} However, some consider it unethical to punish the victims of tobacco industry manipulation unless all efforts are exhausted to curtail the sale of tobacco products to youth (Florida is recognized as having one of the most aggressive programs in the country to reduce sales to youth). While the use of fines and other legal penalties such as community service or losing driver’s licenses for underage tobacco possession are vilified as criminalizing victims or blaming the victims of tobacco industry manipulation,\textsuperscript{19,22,53} schools are left with far more destructive penalties such as expulsions and suspensions to control the problem without possession penalties such as fines. Setting the ideology and rhetoric aside, the question should be asked if it is more destructive to fine a child or to revoke a driver’s license than it is to suspend or expel a child from school. The potential destructiveness to the child and to the other children who may be influenced by the norm of smoking if children are allowed to smoke in school or around school should also be considered.

It may be time for the public health education community to reexamine its dichotomization of social change as being normative/reeducative versus power/coercive.\textsuperscript{54} Can so-called normative education approaches be expected to successfully address youth tobacco use without addressing the norms and peer influence that occurs with large numbers of students smoking just a few feet from the school’s boundaries or at other locations frequented by children such as shopping center malls? Is it practical or even logical to consider the social messages and results associated with enforcement to be distinct from other social messages that we consider normative? Research complementing Social Cognitive Theory\textsuperscript{47,48} clearly establishes the role of imitation in behavior change. Recent studies conducted by the University of Miami\textsuperscript{55} confirm that seeing other children smoke is perceived by children to be a major reason why other children start smoking cigarettes. Perhaps the use of enforcement as it is being used in Florida (to reduce the high-profile use of tobacco rather than to curtail tobacco use wherever and whenever it occurs) should be characterized as normative change programs to decrease role modeling.

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Reconciling Concept and Context: The Dilemma of Implementation in School-Based Health Promotion

Marjorie A. MacDonald, PhD, RN
Lawrence W. Green, DrPH

The researchers used grounded theory methodology to study the implementation of a school-based alcohol and drug prevention project in secondary schools in British Columbia, Canada. Prevention workers (PWs) were responsible for working with school and community personnel in a collaborative process to develop, implement, and evaluate prevention strategies in the school using an adaptation of the Precede-Proceed Model for health promotion planning. Before they could begin to do this, PWs had to establish their credibility in the school. Once accepted, the focus of the PWs’ work was to reconcile the goals, values, and philosophy of the project with those of the school. In doing so, PWs encountered many practical dilemmas. The challenges in resolving these dilemmas are presented, and the implications for policy and practice are discussed.

In 1992, the Alcohol and Drug Programs (ADP) Branch of the British Columbia (BC) Ministry of Health initiated a pilot project to reduce alcohol, tobacco, and other drug use by adolescents in secondary schools. The ministry based the need for the program on a 1990 survey \(^1\) that indicated that BC youth had much higher rates of substance use than youth in other parts of Canada \(^2\)–\(^4\) and the United States. \(^5\)

**PROGRAM DESCRIPTION**

The provincial government requested proposals from community-based alcohol and drug agencies, in partnership with school districts, to implement locally developed substance misuse prevention programs in secondary schools (Grades 8 to 12). The project

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Marjorie A. MacDonald is an associate professor in the School of Nursing at the University of Victoria, Victoria, British Columbia, Canada. Lawrence W. Green is Distinguished Fellow and a visiting scientist, Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia.

Address reprint request to Marjorie A. MacDonald, Box 1700, School of Nursing, University of Victoria, Victoria B.C., Canada V8W 2Y2; phone: (250) 472-4265; fax: (250) 721-6231; e-mail: marjorie@uvic.ca.

This study was supported by a research grant from the British Columbia Ministry of Health to L. W. Green at the University of British Columbia and by doctoral fellowships from the B.C. Ministry of Health and the National Health Research and Development Program in Canada to M. MacDonald (NHRDP 6610-1987-47). We wish to thank all of the school staff, students, prevention workers, and others who gave so generously of their time to participate in this study. We are also very grateful to Judith Ottoson for her foundational work on implementation theory and for coining the title of this grounded theory, “Reconciling Concept and Context.” We thank Gary Gramms, Bonnie Long, and Judith Ottoson, who were members of the supervisory committee for the dissertation research on which this article is based. Finally, we are indebted to the anonymous reviewers who provided us with excellent feedback and helpful suggestions for improvement of the article.

*Health Education & Behavior, Vol. 28 (6): 749-768 (December 2001)*

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involved the implementation of a new prevention worker (PW) position in the schools and the use of a defined planning process to guide program development. The new role was created because schools did not believe they had sufficient resources to devote to substance misuse prevention and teachers have traditionally been reluctant to take on this role. The funders asked schools to provide office space, clerical support, and PW supervision, while the community agency was funded to hire a PW of their choice and to provide a small program budget.

Half of the PWs had training in alcohol and drug counseling. The rest had educational backgrounds in nursing, health education, psychology, sociology, teaching, and counseling. The PW was to engage the school and community in a collaborative, community development process to identify their own substance misuse issues and to develop, implement, and evaluate their own strategies to address these concerns within a comprehensive school health framework. The School-Based Prevention Project (hereafter called the project) was based on the premise that substance misuse prevention is more likely to be successful when driven by community needs, implemented within the context of comprehensive school health, and linked to community resources.

Although the program was to be defined by the school community, ADP expected PWs to work within a broad set of guidelines, which included using the Precede-Proceed Model to guide the planning process, devoting 75% of their time to primary prevention/community development, and 25% to early intervention. At the annual weeklong training conference, attended by PWs and agency and school personnel, ADP provided training on the use of the model. At the first training session, many participants objected to the Precede-Proceed Model because they felt it was imposed on them, was too complex and difficult to use, and did not fit with the way schools operated. Therefore, ADP staff redesigned the model and renamed it the School-Based Prevention Model (hereafter called the model) (Figure 1). This change reduced but did not eliminate opposition. Details of the reconceptualized model are discussed elsewhere.

**STUDY PURPOSE AND RATIONALE**

The purpose of this study was to develop a theoretical understanding of the process by which PWs implemented the model and PW role, and the contextual influences on that process. For the most part, school health researchers have conceptualized implementation within a diffusion-of-innovation paradigm, in which a standardized curriculum, developed by outside experts, has been implemented in schools, with fidelity of implementation the goal. In diffusion theory, the main influences on implementation are the nature of the innovation and characteristics of the implementer. Guided by diffusion theory, researchers have studied the influences on implementation of different types of curricula, teacher training and experience, provider type, and teacher preparedness and motivation. Limited attention has been paid to the influence of social, political, and cultural variables.

The persistent emphasis on diffusion theory by health education researchers is surprising given that researchers in the broader field of education have moved beyond the technical-rational perspective reflected in diffusion theory to use other theoretical lenses to study implementation, including organizational development and political frameworks. These studies have shown that the implementation of school programs is influenced less by program design and implementer characteristics,
and more by the interaction of the program with its organizational context and by the culture within which implementation occurs.

Other researchers have explored the influence on implementation of some factors in the school organization and environment such as school policies, structural support, and parental involvement. Still, the exploration of the school environmental and cultural factors remains limited. Most studies have characterized implementation as a static event studied at one point in time rather than as a process. We doubt that quantitative measurement of implementation, even at two points in time, can capture the complexity of that process.

Approaches to drug use prevention that are community driven and specific to the local setting are becoming more common because of differences among communities in population makeup, sociopolitical environment, economics, knowledge differences, and extent of drug misuse. The problem with community-driven approaches, such as the project explored in this study, is that local autonomy leads to treatment heterogeneity, making evaluation and comparison difficult. Fisher has proposed that it may be more important to focus on defining and evaluating the process by which programs are developed, rather than on defining and evaluating the interventions. Some community-based studies of this nature have been reported.

This project involved a general process rather than a defined program. Core elements were common across sites but the program that emerged in each school looked quite different. The project’s conceptualization as a nonstandardized, locally developed innovation meant that traditional quantitative methods for studying implementation were inappropriate. Qualitative evaluation strategies are useful for studies in which program implementation is an important focus and descriptive information is needed to determine

Figure 1. School-based prevention model.
what is actually happening in a program.\textsuperscript{45} Decision makers are often interested in whether and how a program has deviated from initial plans and why this has occurred. If this is true, then methods to study implementation must be open-ended, discovery oriented, and capable of describing developmental processes and program changes.\textsuperscript{45} Thus, we believed that a qualitative study of implementation in context would make a useful contribution to the literature.

\section*{METHOD}

The qualitative study reported here took place within the context of a larger evaluation study that involved a quasi-experimental, cross-sectional, control group design. In the larger study, we surveyed students, teachers, administrators, and PWs in a sample of project and control schools during Year 1 and Year 3 of the project (N = 19).\textsuperscript{46,47} The student survey included questions on drug use behavior, its determinants, school climate, and student participation in prevention activities. PW, teacher, and school administrator surveys questioned participants on attitudes toward prevention, organizational climate, implementation issues, and program activities.

We chose grounded theory as the method for this study because we were interested in exploring an interactional process (model and PW role implementation) and developing a theoretical understanding of that process. Grounded theory is a qualitative, interpretive method that does not begin with a predetermined conceptual framework. Rather, the emergent theoretical conceptualizations are derived from and therefore grounded in the data.\textsuperscript{48-51} Participants were asked open-ended questions, such as “Tell me about your experience with the implementation of the project.” This type of questioning allows the data to reflect participants’ experiences and understanding, rather than being directed by the researchers’ preconceived theoretical notions. Data collection and analysis proceed simultaneously, so the theoretical concepts emerging from the data direct decisions about further sampling and data collection.

\subsection*{Data Collection}

We used multiple methods for data collection and multiple data sources for this study. Participant observation\textsuperscript{52} field notes were taken during the initial 1-week training session and three subsequent annual training conferences. Observations focused on PWs’ responses to the model; discussions among PWs, agency, and school personnel about early and later implementation; and their understandings about the program. In Year 2, 4 to 6 months after the second annual training session, we conducted telephone interviews with 28 of 31 eligible PWs, which focused on the revised model. Questions were derived from analysis of the field notes and survey data gathered during Year 1 of the study and asked about job expectations, training, understanding about and application of the model, and implementation experiences, including barriers and facilitators. At the end of Year 2, we held 10 focus groups, 2 in each of the five ADP regions of the province, 1 with PWs in that region, and 1 with ADP and community agency personnel. Questions, derived from the analysis of PW interview data, asked about agency and ADP perspectives on implementation and about issues raised in the PW interviews.

During Year 3, we conducted case studies in six project schools. The purpose was to document the innovation taking place in those schools, to explore the implementation
process in depth, and to identify influencing factors and the contextual conditions within which different implementation experiences occurred. To be eligible for selection, schools had to be willing to participate and have student, administrator, teacher, agency, and PW survey data available. This allowed us to link our quantitative and qualitative data for the larger evaluation study. On the basis of all available data, schools were classified according to early implementation experiences and activity, student drug use rates, community socioeconomic status, level of project support in the school, urban/rural location, and region of the province. Twelve schools were eligible. Because of the resource-intensive nature of case study data collection, only 6 of these schools were selected. Evidence from the extensive data that had been collected up to the point of the case studies, however, suggested that 6 schools were sufficient to represent the major patterns of implementation experience across the schools. Thus, case selection was in keeping with grounded theory sampling principles, in that they reflected maximum variation on the selection criteria.45,53

We conducted more than 100 interviews in the six sites with school administrators, teachers, students, parents, and community agency staff. We asked open-ended questions about the nature of the PWs’ work, the program developed by each school, the level of understanding and support for prevention, implementation experiences, barriers and facilitators to implementation, support for the PWs’ actions, and the nature and extent of the school’s alcohol and drug problem. Observations focused on prevention activities in the school and on the PWs’ daily routines and interactions. Field notes were recorded throughout the 1-week visit.

Analysis

All interviews were tape-recorded and transcribed and field notes were typed for analysis. Data were entered into the NUD*IST software program for qualitative analysis,54 and transcription accuracy was verified.55,56 We analyzed the data using the constant comparative method of grounded theory.48-51 Grounded theory involves an iterative process in which the analyst moves between inductive derivation of theoretical concepts from the data and deductive testing of those concepts, and hypotheses about relationships between the concepts, against the data. Interpretive researchers acknowledge that “the researcher is instrument”57 and therefore take care to ensure that the researcher’s preconceived theoretical ideas do not drive the process. The procedures of the grounded theory method are designed to control for this to the extent possible.48-51 Asking open-ended questions to allow the participants’ experiences and interpretations to direct the process is the first step. Other procedures to ensure rigor are discussed later in the Trustworthiness section.

The first level of analysis involves line-by-line coding. The analyst constantly compares empirical indicators in the data to determine similarities and differences. When a conceptual code is generated, the indicators are compared to the emerging concept. By comparing the indicators in the data with each other and to the emerging concept, the analyst slowly builds up concepts and their properties and discovers the relationships between them.59 Throughout the coding, memos are written to track and record the emerging conceptualizations and to identify issues and questions for follow-up. In the memos, the researchers identify their own ideas about what is going on, but these ideas are constantly checked out and verified against the data. Second-level coding involves grouping and regrouping the emerging concepts into categories, their properties and associated types, dimensions, circumstances, and influencing conditions.49,51 Finally, the ana-
lyst explores the data to identify and describe relationships among the categories and concepts. The aim is to identify a conceptual framework that explains the phenomenon under study.

**Trustworthiness**

Criteria have been developed for assessing the trustworthiness of qualitative research. We used several strategies for enhancing trustworthiness to ensure that our constructions were congruent with those of participants and other disinterested reviewers and that the concepts were truly grounded in the data. Rigor in qualitative research requires prolonged engagement in the field (i.e., lengthy and intensive contact with the phenomenon/respondents) to ensure that the analyst is immersed in, and understands, the culture. We were in frequent contact with participants during a 4-year period. We also used a peer-debriefing process as a check on the coding and to ensure that the theoretical conceptualizations could be verified against the data. The analyst met with a grounded theory seminar group, which included expert grounded theorists, every 2 weeks during several months to validate the coding process.

A third strategy to ensure rigor is the triangulation of data sources and methods. As noted above, we used multiple data sources and methods to ensure that many perspectives were reflected in the data and that one interpretation could be verified against another. We conducted member checks to verify the theoretical conceptualizations. Several research participants were asked to validate the concepts and categories as they emerged and to validate the final conceptual framework. All agreed that the grounded theory reflected and explained their collective experiences.

The final strategy we used to ensure trustworthiness was negative case analysis. Once the general processes and categories have been identified, the analyst actively searches the data for negative instances or for situations that do not fit the conceptualization that has emerged in the analysis. The peer-debriefing group assisted us in the search for negative cases and we were unable to locate any instances.

**RESULTS**

The core category of Reconciling Concept and Context emerged from the analysis (Figure 2). The basic problem encountered by PWs was the challenge of implementing a concept that emerged from one system reflecting a particular set of values and goals into an entirely different system with its own set of values and goals. To manage this problem, PWs engaged in the process of reconciling concept and context.

To distinguish the levels of categories in the grounded theory discussed below, we have capitalized the three major categories (e.g., Entering the Field), shown second-level categories or processes in bold print (e.g., gaining entry), and underlined third-level categories (e.g., establishing program legitimacy). Grounded theorists use gerunds to name categories to reflect that they are processes. We have italicized the factors that influence these processes and used quotation marks for terms used by participants to label their experiences.

To implement the project, PWs had to be in a position to modify the context (the school) in a way that the concept (PW role and the model) could be integrated. Thus, they Entered the Field, going through processes of gaining entry, creating the PW role, and
enhancing school readiness to engage in consensus-based actions for program development. For PWs to Do the Model, they also had to reconcile the concept with the context, modifying it to fit the situation. First, they had to Confront the Model they felt ADP had imposed on them. Many reacted negatively to the model, but following the model’s reconceptualization, most PWs made efforts to learn the model despite the challenges they experienced in doing so. They finally came to a point at which they contemplated whether they would proceed with Doing the Model.

The two processes of Entering the Field and Confronting the Model began quite separately for the PWs, with no apparent relationship between them. It was as though the initial phases of Confronting the Model occurred in isolation from the PWs’ daily practice. The project developers intended that PWs would enter the school and immediately begin using the model to assist the school in developing its prevention program. What ADP and the PWs did not count on was a lengthy entry period during which the PWs faced many challenges in getting established as legitimate and credible members of the school community. This drew attention and energy away from the process of learning and integrating the model into the PWs’ practice. Thus, Confronting the Model was upstaged by the process of Entering the Field. It was not until the stage of enhancing school readiness that the model became more relevant to the PWs’ practice but the PWs had to find ways to make it work in the school, often by modifying the model. Ultimately, these processes merged as they culminated in the third category of Doing the Model, in which the PWs used the model in a variety of ways, not necessarily as intended. In Doing the Model, however it was used, PWs did integrate it into their work. Table 1 identifies the three main categories and the second- and third-level subcategories of the reconciling process.

**Entering the Field**

**Gaining Entry**

Gaining entry was a challenging process for PWs and many struggled through this phase. To gain entry, the PW needed to establish program legitimacy in the school, establish personal credibility, and learn the ropes of the educational system. To establish legitimacy, PWs had to overcome opposition from teachers and counselors who thought that
PWs might take over their responsibilities. Many teachers and administrators were confused about the project and the PW role in the school. The PW had to clarify conflicting expectations that resulted from insufficient preparatory groundwork by school districts, alcohol and drug agencies, and ADP.

In schools where a participatory school adoption process had taken place, there was more clarity and agreement on the expectations among stakeholders than in schools that experienced an imposed decision. When ADP, the agency, and the school district did sufficient groundwork, the school adoption process was more likely to be collaborative. This, in turn, generated school support for the project among administrators, teachers, counselors, and their unions, thus establishing legitimacy.

The level of school readiness for a prevention program influenced the ease with which the PW was able to gain entry and establish legitimacy. The extent of readiness was determined by the presence of one or more of several features: (a) The school had adopted the project because they believed it would help them address an acknowledged problem in the school; (b) teachers and administrators had a clear understanding of, and supported, the funder’s expectations for the project; (c) a fit existed or evolved between the school’s philosophy, vision, and goals and the philosophy of the project; (d) school personnel understood and valued the meaning of prevention; (e) the school’s commitment to implement the project was reflected in the allocation of resources for implementation; and (f) the school supported comprehensive school health. Overall, schools with higher levels of readiness facilitated a smoother entry and role creation than schools with low levels of readiness.

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**Enhancing school readiness**

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**Doing the Model**

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PWs also had to establish personal credibility in an environment in which staff members do not accept outsiders readily, particularly nonteachers. To establish credibility, PWs began by being visible and accessible. They began “doing what we know;” “doing for” teachers whenever possible, “doing everything” that came along and “doing well” at whatever they did.

Many PWs came from the alcohol and drug services system and had never worked in schools and thus had to learn the ropes through immersion in the host culture before they were accepted. Once the PW had established his or her own credibility, the legitimacy of the project, and learned enough about the school culture to function as a member of the school community, he or she had finally achieved peerage. That is, PWs achieved a level of status in the school that gave them enough influence to create their own role and to initiate some changes to enhance the school’s readiness to engage in prevention activity. Peerage presented a paradox, however. PWs had gained some influence, but their newly acquired status was precarious enough that they were unable to challenge the status quo to make the more radical changes that might be necessary to address the issue of alcohol and drug misuse by students.

Creating the Role

Once PWs had gained entry, they had to create a viable role in the school. The first of several dilemmas the PWs confronted emerged as they tried to find a focus for their role, either staying narrowly focused on alcohol and drug use behavior or taking a broader health promotion or comprehensive school health perspective. In a few situations, the school was more interested in a comprehensive approach that recognized multiple common determinants of many problem behaviors. Many ADP managers, however, wanted the PWs to focus solely on activities that related specifically to substance use behavior, in keeping with the ADP mandate. This created tension for PWs, particularly those who had a solid theoretical understanding of adolescent substance use and its relationship to other adolescent behavior. Many PWs resolved this dilemma in favor of the school’s wishes and did not report the full breadth of what they were doing to ADP.

The second dilemma emerged as the PW tried to strike a balance between primary prevention and early intervention. Although the major focus of the program was prevention, the reality was that the schools were more interested in, and demanded, intervention (counseling or treatment services). In part, PWs had created this demand by their early actions in the school to establish their credibility. To be accepted, they had begun by doing what they knew. In particular, PWs with a counseling background began to do intervention work with individual students who had drug use problems. Thus, the PWs’ initial efforts to gain entry and create conditions in the school within which prevention could occur had the paradoxical effect of increasing the demand for intervention rather than prevention services. This demand was fueled by the perceived needs of the schools, the value schools placed on prevention versus intervention, and on how school personnel understood prevention. Most understood it to mean an individual focus on drug-using students to prevent future problems rather than to mean a population-focused approach to prevent substance use and/or misuse among students who were not currently using substances. For many people in the school system, and many PWs as well, primary prevention was not valued. Many PWs had limited experience doing prevention and thus were unsure about what prevention strategies would be appropriate. Several PWs commented that they did not have a theoretical understanding of effective prevention.
The PWs best able to hang onto prevention, in the face of demands for intervention, were those who had not worked exclusively in treatment-oriented settings. PWs who had experience working with a broad range of youth, not just high-risk youth, and who had previously done community development work were able to resist the pull to full-time intervention and counseling. PWs whose previous work had involved an “individual focus” tended to manage the prevention versus intervention dilemma by “redefining prevention” so that it encompassed what they were actually doing, that is, early intervention and counseling of individual students.

The third dilemma involved striking a balance between the emphasis of the project on proactive planning and the schools’ propensity for crisis management. The model is a systematic planning process in which information is gathered and used to set priorities for action. ADP expected PWs to engage the school community in this process. Most schools, however, did not manage their day-to-day activities in this way, and this type of planning was unusual. Schools were continually dealing with crises. They lived in the moment, reacted to issues as they emerged, and solved problems when they arose. Most PWs found that proactive planning simply did not occur, and it was a constant struggle not to be drawn into a reactive stance. Schools governed themselves by certain norms, one of which is the norm of “immediacy.” This created an organizational demand for action, which the PW responded to by “doing.” It was difficult for PWs not to respond in a reactive way because of this norm.

Again, the PW’s own background and experience influenced how she or he managed the process. Those who had a counseling background, for example, were accustomed to helping people deal with problems and manage crises. They tended to fall easily into this mode of action seeing it as the most important thing to be doing. By contrast, PWs who viewed the entire school as their client, not just the high-risk students, were able to resist reacting constantly to crises and maintained a proactive stance with regard to prevention.

It soon became clear to most PWs that the demands of the school context were in conflict with the goals, values, and philosophy of the project. In managing these dilemmas, PWs created different types of roles in the schools. These roles can be located on a continuum represented at either end by two ideal types: a capacity-building role and a service-provision role. Table 2 outlines the characteristics of these two types. Some PWs clearly fit into one or the other of these, while others had characteristics of both, although their practice tended toward one or the other.

Enhancing School Readiness

Before the PW and the school could make progress in implementing collaborative prevention strategies, the school had to be ready and willing to do so. To enhance school readiness, PWs faced several challenges: selling the issue, selling the model, facilitating participation, and steering the steering committee.

Although the model emphasizes the importance of beginning with local problem definitions, many PWs found themselves having to sell the problem of substance use before they could initiate a comprehensive program. The need to sell the problem occurred when the decision to adopt the project had been made at the district level and imposed on the school. In many schools, administrators and teachers seemed unwilling to admit to having drug problems in their school. Although they believed that individual students had drug problems, they did not view this fact as a school problem. Some teachers said that they were reluctant to admit to the problem because then they might have to do something about it. Administrators were often concerned about public relations and the image of
theirschoolinthecommunity.Insuchschools,PWsfeelttheymightneversucceedingget -

ADPexpectedPwsnotonlytousethemodeltoplanandimplementpreventionactivi -

to the school as a planning framework. Many PWs were

Community participation is a fundamental principle of health promotion. Facilitating participation by administrators and teachers, however, was a major challenge faced by
PWs. Participation was impossible if the PWs had not first established project legitimacy and their own credibility. Most PWs found that it was they who had to do the work, “carry the ball,” and get things going in the school. Teachers were willing enough to have programs established, but they wanted the PW to “just get on with the job and leave me out of it” because they already felt overworked and pressed for time. In the few schools in which there was a high level of participation, the PW had usually adopted a capacity-building role or was charismatic, and there was a high level of commitment from the school administrators. This commitment only occurred in situations in which there was a clear fit between the project goals and the vision of the school, and that was rare.

One of the first steps in the revised model was to form a steering committee to guide the implementation of prevention strategies. ADP assumed this would be straightforward. In fact, most PWs had difficulty establishing a steering committee, and many did not do so until well into the second year of the project. Many PWs felt that the time and effort it took to nurture the steering committee took time away from other things the PW could and should be doing. In the end, they felt that they were steering the steering committee rather than the other way around.

Confronting the Model

PWs were introduced to the model for the first time at the annual training session. To confront means (a) to bring or come face-to-face with, especially with hostility, or (b) to meet or encounter. Both meanings of the term are relevant. Some PWs, in confronting the model for the first time, reacted to the model with hostility, not necessarily because of the model itself but because of the context in which it was presented. Other PWs met or encountered the model with interest or indifference. The nature of this reaction influenced how well the PW learned the model, what they understood about it, and their intentions for using it, that is, how they contemplated the model. Ultimately, this process determined whether and how well they were able to apply or “Do” the model.

Reacting to the Model

The PWs’ reaction to the model was influenced by several factors. PWs came to the training session with a set of perceived learning needs and expectations that were, in turn, influenced by the PWs’ backgrounds and whether they had already been working in the school prior to training (i.e., timing of the training). Most PWs who had not yet entered the Field when they attended the training session reacted to the model in a positive or neutral manner. To them, the model provided a concrete approach to implementing a prevention program in a school setting. PWs who had been working in the school before the training session perceived that the model did not provide much guidance for them in dealing with their current problem, which was gaining entry. PW expectations, in combination with a lack of PW participation in planning the training session, PWs’ perception of an imposed agenda by ADP, and the way the model was presented to PWs led to many PWs reacting with hostility to the model.

Learning the Model

There were many barriers to learning the model. ADP designed the training session to provide PWs with an opportunity to learn, understand, and practice the model. This did
not occur because some PWs diverted the training agenda in their pressing need to debrief their early experiences in the field. The model was simply not salient for them at that time. Once back on the job, they realized that they did not understand the model sufficiently to implement it themselves or sell it to others. There was no one there to provide them with needed technical assistance because neither the community agency nor the regional ADP staff had a good grasp of the model as yet. The demands of the school context kept PWs from attempting to learn and practice the model such that many PWs felt that they had to make a choice between “doing the model and doing the job.” Thus, although the model was intended to be the framework for “doing the job,” many PWs could not integrate it into their work. The model seemed to be something the PW had to do “in addition to all my other responsibilities” rather than the framework within which they carried out their activities.

Contemplating the Model

Once PWs found the time to think about the model, usually after gaining entry, they sized it up, noting strengths and weaknesses. PWs understood the model in remarkably diverse ways, which included seeing it as “anything you want it to be,” “a concrete, sequential problem-solving approach,” “a way of thinking,” “a touchstone,” and “a set of community development principles.” Having made an initial judgment about the model, they tried it on, assessed its fit with their own style and philosophy of practice, and determined whether it fit with the way the school did business. Some PWs concluded that the model had a good personal fit because each PW tended to interpret it in a way that was consistent with his or her own values and patterns of practice. Most PWs, however, assessed the model as fitting poorly with the school context. PWs then decided whether to buy into the model or reject it as a guide to their own practice. For those who bought into the model, they expressed Doing the Model in a wide variety of ways.

Doing the Model

Doing the Model is the culmination of both Entering the Field and Confronting the Model. It comprised two processes: planning with the model and applying the model. PWs took one of two planning approaches to using the model: project-by-project planning or comprehensive planning. Within either of these approaches, PWs who used the model did so either alone as a solitary planning activity or as a collaborative planning strategy. The ways the PWs applied the model included doing the model by the book, approximating the model, reinventing the model, retrofitting the model, reframing the model, and using the model as a mental map.

Not many PWs in this study achieved the ideal of Doing the Model as the training handbook presented it. Although many PWs said they were doing the model by the book, their descriptions revealed that they were using the model in some other way. Several PWs tried to do it “by the book” but became discouraged by barriers they perceived in the school setting. Some PWs approximated the model in that there were some identifiable features in their approach, but major elements were missing. Others reinvented the model by making deliberate and sometimes extensive changes to the model to suit themselves and their circumstances, often due to administrative pressure or the demands of the organizational context.
Retrofitting the model meant retrospectively fitting one’s actions to the model. These PWs did not intend to use the model but reported that they did to meet their contractual obligation. Reframing the model was similar but distinguished by the intention behind it. In re-framing, PWs had no intention to deceive but used the model as a general guide, then checked back to ensure their actions fit the model. Similarly, using the model as a mental map meant “carrying the idea of the model around in my head” as a general guide to action.

PWs who tried to use the model by the book or who approximated the model were more likely to develop a comprehensive plan than those who used it in other ways. Some PWs, however, did not use the model as a guide but still managed to develop a comprehensive and sound program plan, particularly if they were using a comprehensive school health framework. These PWs, irrespective of how they used the model, tended to create a capacity-building role and to be working within a supportive school context. Thus, the PWs’ own philosophy of practice and the support of the school were more important in the development of a comprehensive plan than the use of the model itself. Overall, only a few PWs used the model in a way that approximated the original intent of ADP.

DISCUSSION

In this study, we discovered how PWs, in a new school-based role, managed several dilemmas in trying to implement a substance misuse prevention program in secondary schools, using a systematic planning model. By uncovering these dilemmas, this study has implications for the future implementation of health promotion programs in schools.

Most school personnel did not share the project’s definition of prevention and gave priority to dealing with presenting problems in students. Although one might expect that the mission of schools would be more amenable to a prevention agenda, Sarason has argued that school personnel have difficulty adopting a preventive stance because their phenomenology is so shaped by their socialization and embeddedness in a “problem-creating, problem focused system” that deals primarily with the individual problems.36,63 It is not surprising then that many PWs felt drawn into a service-provision rather than a capacity-building role.

The priority given to managing crisis derives from the structure and social organization of schools that supports action, not reflection.64-67 The use of rational planning models in schools is thus questionable given their often chaotic environments.68 Planning models assume that “orderly collection of data and deliberation about what the data say should help discipline decision making and thereby enhance the quality of plans” (p. 44).69 In schools, however, formal data from the planning process take second place to commonsense, everyday knowledge grounded in experience.68-71 Some researchers have thus suggested that “evolutionary planning” may be more effective in schools. In this approach, vision and strategic planning come after initial action, not before.68,72

Because many PWs interpreted the model in light of the problems confronting them, it had no relevance to their work. Although the first stage of the model is called “Getting Ready,” it does not account for the extensive period of relationship building and achieving peerage that was necessary before PWs could begin to implement the model, nor does it account for the need to create a climate in which prevention will be accepted and understood before such programs can be implemented with any degree of fidelity to the concept. In a recent rendition of Precede-Proceed, a front-end analysis has been added, which involves assessing community capacity to engage in the process laid out in the model.73
Had such an analysis been applied to project schools, there might have been a more realistic set of expectations about what PWs might accomplish and better planning for the challenges ahead. Further revisions to the model should accommodate these changes.

The multiple interpretations and applications of the model are an interesting finding, given the widespread use of planning models for health education and promotion. For example, there are more than 700 published accounts of the Precede model in the literature. We discovered, as did Ottoson, that despite a consistent visual and written representation of the model and training by experts, there were nearly polar opposite interpretations by different PWs, which in turn influenced how the model was applied. This raises the question of whether implementation fidelity is either realistic or possible in relation to process innovations such as this prevention model.

IMPLICATIONS FOR POLICY AND PRACTICE

Many problems in gaining entry to a school to engage in health promotion can be circumvented by doing the necessary groundwork to prepare for implementation. School readiness for prevention can be facilitated by ensuring adequate participation by schools in the adoption decision, a high level of support for the program, and clear, understood, and mutually agreed upon definitions and expectations. These steps should be included in the Getting Ready stage of the model. At the same time, it is important to remember that the practitioners from the public health and education systems have different goals, values, and philosophies of practice that may not be easily reconciled. School systems are inherently conservative, and it may be unrealistic for practitioners to expect more than marginal changes to accommodate health promotion in the short term. We are in this for the long haul and may need to spend much more time in a revised “Getting Ready” stage of the model before proceeding to implementation.

Hiring the right people for the job is absolutely critical. Policy makers and program developers cannot assume that just anyone can do prevention, as they did in this project. School-based prevention practitioners require a strong theoretical understanding of, and experience, doing prevention. A person who is skilled and knowledgeable about prevention and about school systems is more likely to have the resources to resist being drawn into intervention, crisis management, and service provision at the expense of prevention, proactive planning, and capacity building. Such a person is more likely to be able to use the model effectively. Thus, the solution may not lie in adherence to the model as conceptualized but in ensuring that practitioners have a relevant theoretical orientation and focus.

Given a widespread consensus on the importance of comprehensive school health, it appears that schools and teachers have not been prepared to engage in, and support, prevention programs in the school system. At the same time, schools cannot tackle this problem alone. Sarason argues that the only way this can be accomplished is by a radical restructuring of teacher education. In the meanwhile, however, closer collaboration between government departments of health and education and the university programs that prepare teachers might begin to address this complex issue.

Prevention models are complex and demanding because the problems they are designed to address are also complex and difficult to resolve. Adequate training and ongoing technical assistance are important to support practitioners in doing this challenging work. But models are not prescriptions. A body of research on implementation supports the proposition that implementation will not be successful if there are rigid require-
ments for fidelity. Successful implementation means that implementers must have flexibility to adapt an innovation to local circumstances. By hemming PWs into a rigid application of what was originally conceived as a flexible model, in the face of strong opposition from schools, ADP gave PWs little choice but to circumvent their directives.

At the same time, the notion of adaptation may create an unintentional paradox, at the root of which lies the recognition that the problems facing young people and schools are so complex that they defy simple solutions. The results of this study could be interpreted to suggest that for schools to implement a prevention program (or process), it must be simple, fit with existing goals and values, not challenge the status quo, and involve changes that are not too different from current practice. The paradox is that such an innovation may not be potent enough to be effective. If the only programs we can implement are those that involve marginal changes, problems may become intractable. At the same time, however, some PWs and schools did engage in promising prevention activities, suggesting that prevention efforts that incorporate the lessons of studies like this might eventually have some impact.

LIMITATIONS AND STRENGTHS OF THE STUDY

Because the purpose of qualitative research is not to generalize the findings to a larger population of schools, we cannot say with certainty that the implementation experiences of these schools can be applied elsewhere. Such application will depend on the extent to which local circumstances fit with the context described in this study. Only those working in those situations can make that judgment.

Phillips identified two limitations to qualitative research: (a) Researchers are likely to be unduly influenced by positive instances and not so sensitive to the significance of negative instances, and (b) the findings are more likely to reflect the idiosyncratic notions of the researcher. In this article, we discussed how these threats to validity were overcome, first by the procedures built into the method itself and second by the additional steps we undertook to ensure trustworthiness.

This study also had important strengths, not the least of which is the development of theory related to implementation in the school context. Without our qualitative data, we would not have understood the challenges of implementing the PW role and the model. Because we followed implementation prospectively over time, we gained an understanding of the evolving nature of implementation and the influence of factors in the school context that have not been found in other studies. The challenges we identified to establishing prevention programs in schools may lead to better conceptualization and implementation of school-based programs in the future.

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A Model of Self-Regulation for Control of Chronic Disease

Noreen M. Clark, PhD
Molly Gong, MD
Niko Kaciroti, MS

Chronic disease poses increasing threat to individual and community health. The day-to-day manager of disease is the patient who undertakes actions with the guidance of a clinician. The ability of the patient to control the illness through an effective therapeutic plan is significantly influenced by social and behavioral factors. This article presents a model of patient management of chronic disease that accounts for intrapersonal and external influences on management and emphasizes the central role of self-regulatory processes in disease control. Asthma serves as a case for exploration of the model. Findings from a 5-year study of 637 children with asthma and their care-taking parents supported that the self-regulation elements of the model were reasonably stable over time and baseline values were predictive of important disease management outcomes.

As chronic diseases (by definition illnesses without known cure) pose an ever greater threat to individual and community health worldwide it is increasingly important to understand how to control their effects. There is general agreement that the ill person is the manager of a chronic condition unless or until the illness is fully debilitating. For many, if not most, chronic diseases (e.g., asthma, heart disease, several forms of cancer, arthritis, diabetes, etc.), the individual, with guidance and in close cooperation with a clinician, must on a daily basis carry out the recommended therapeutic regimen (see, e.g., the National Asthma Education and Prevention Program (NAEPP) Guidelines for Asthma Management). There is also general agreement that the social and physical environments of the person must be conducive to effective management. Assistance, services, programs, and policies must be in place to enable the person’s day-to-day management. Figure 1 uses asthma as an example to illustrate the circles of influence affecting a patient’s ability to gain optimum control over the disease. Neither the theoretical relationships among the wide range of factors apparent across these circles of influence nor those related factors associated with achieving (or not) desired disease control outcomes have received extensive attention in the disease management literature. This article discusses a model for disease prevention and management that accounts for these intrapersonal and external influences and emphasizes self-regulatory processes as necessary for disease control.

Noreen M. Clark, Molly Gong, and Niko Kaciroti, University of Michigan School of Public Health, Ann Arbor, Michigan.

Address reprint requests to Noreen M. Clark, University of Michigan School of Public Health, 109 S. Observatory Street, Ann Arbor, MI 48109-2029; phone: (734) 763-5454; fax: (734) 763-7379; e-mail: nmclark@umich.edu.

The work presented in this article was supported by MD/Family Partnership: Education in Asthma Management Grant HL-44976 from the Lung Division of the National Heart, Lung, and Blood Institute.

Health Education & Behavior, Vol. 28 (6): 769-782 (December 2001)
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control. Asthma serves as a case for exploration of the model, and findings will be presented from a study of asthma patients to comprise a test of the model’s elements.

A MODEL OF DISEASE MANAGEMENT

Elements of Self-Regulation

We have proposed a model of disease management where the ability of the person to be self-regulating is viewed as central to achieving desired end points. A refined version of the model is presented in Figure 2. The theoretical underpinning of the model is social cognitive theory and it is based on the idea that through self-regulatory processes individuals learn the strategies they use to manage a disease like asthma. In other words, the content and skills of disease management are derived through the process of being self-regulating. Being self-regulating means being observant and making judgments based on observation (versus habit, fear, tradition, etc.). It entails reacting appropriately to achievement of the personal goal when attempting to change one’s own behavior. The model is also predicated on the idea that the processes comprising self-regulation are continuous and reciprocal. Information, behavior, understanding, feelings, and conclusions

Figure 1. Concentric circles of influence in asthma control.
generated from any one element of self-regulation as defined in the model (i.e., observing, judging, reacting) continually influence the other elements. A person is motivated to be self-regulating by a desired goal or end point. The more salient the goal, the more self-regulating the person will try to be. The power of the goal is associated with how closely held a value it represents for the individual.

The model as presented in Figure 2 suggests that intrapersonal and external factors give rise to and are modified by the observations, judgments, and reactions of the individual, leading him or her to undertake disease management strategies (including modification of the physical and social environments) so as to achieve a desired end point or goal. One reaction is to determine whether the action taken produced the expected outcome (outcome expectation). Another reaction is whether one feels the confidence to continue the action (self-efficacy).² Over time, continuous observation, judgment, and reaction lead to modification of management strategies and sometimes modification of the goal itself. Each of these elements is discussed in more detail below.

**Internal and External Factors**

The model posits that when taking a disease management action, an individual is influenced by internal factors, that is, information and beliefs he or she has concerning the specific problem. For example, when attempting to manage asthma, people will use (or do not use) inhaled corticosteroids (anti-inflammatory drugs) based, in part, on what they know about the role and importance of inflammation in asthma control and about using a metered dose inhaler.⁶ The action is also influenced by what the person believes to be the benefits of using the medicine to reach his or her personal goal and his or her belief that the benefits outweigh the costs (e.g., safety of the medicine, side effects, financial burden, etc.).⁷ The extent to which the person holds the requisite knowledge and beliefs to support
an action depends, in part, on a range of external factors. These may include role models that can be observed making efforts in asthma situations. They include interpersonal relationships through which emotional and instrumental (social) support is given and received. Almost certainly involved is technical advice from a clinician who provides therapeutic recommendations. Availability of money and other material resources (e.g., the price of medicine and a way to get to the pharmacy) also will influence the person’s behavior.

Management Strategies

Management strategies comprise the individual’s means to keep the disease and its effects under control. These strategies may be effective or ineffective and may be consistent with clinicians’ recommendations or not. Some people left to themselves will derive ways to achieve disease control that physicians or health educators would applaud (e.g., a susceptible asthma patient removing environmental precipitants to symptoms from the living quarters). Many do not (e.g., the person overusing bronchodilators in an effort to reduce symptoms). The point here is that a management strategy evolves from the person’s observations, judgments, and reactions given the aforementioned internal and external factors. Others (role models, technical experts, and family and friends) can influence the strategy chosen, but in the end, the individual’s personal goals, combined internal and external resources, and degree of self-regulation will dictate which management strategy will be derived and further employed. In addition, self-regulation is very specific to particular problems and may not generalize from one behavior (e.g., using medicines) to another (e.g., removing environmental precipitants). Self-regulation (including self-efficacy as part of the self-regulatory process) is not considered a personality trait or characteristic such as being Type A or having low or high self-esteem. Rather, it comprises abilities that are applied to a specific goal and problem within a given context. It may be that one’s ability to be self-regulating in a specific circumstance prepares or helps one to be more self-regulating in another circumstance. However, this result is not necessarily so.

End Points

The motivating factor in taking a disease management action is a personal goal. Goals are highly idiosyncratic. When an educator or clinician (or any other person attempting to assist with disease management) has a different goal than the individual, the opportunity for successful goal attainment is attenuated. Usually, the clinician has a clinical goal (say a better peak expiratory flow rate in a patient with asthma), but this end point is not likely to be as important to a patient as his or her personal goal (say spending time with a loved one whose cat precipitates asthma symptoms). When the clinician and educator focus on achieving the patient’s personal goal, the chances are greater that the therapeutic regimen will appeal to the interests of the patient and be implemented by him or her. Evidence that clinical and personal goals are not always compatible is found in the work of Juniper whose data showed little relationship between clinical measures such as scores on pulmonary function tests in asthma patients and the patients’ own ratings of the quality of their lives.

Sometimes people will disclose their goals to others and sometimes they will not. Most reasons underlying human action are covert, that is, known only to the acting indi-
vidual. Zimmerman has described the phenomenon of covertness in his discussion of the triadic processes of human behavior. It may be that in some cases of people with asthma, the personal goal is shared by the individual’s clinician, the medical facility where the person receives service, the larger health care system, or other stakeholders in the person’s health. For example, the type of health care used may be a shared interest. Patients usually dislike going to the Emergency Department (ED), and clinicians, medical facility administrators, and insurers usually prefer not to have patients use this expensive form of care. The end points that are likely to be of concern to patients, as well as other stakeholders, include the person’s level of day-to-day functioning; perceptions of quality of life; physiological status (e.g., severity of disease); and, as mentioned, use of clinical services. However, reaching these goals may or may not appeal sufficiently to an individual’s motives to act. The primary motivating factor will be his or her highly personal goal. The assumption of the model presented here is that to enable people to be the best managers of their disease requires helping them to improve their self-regulation skills and modifying external factors so these influences enhance one’s ability to be self-regulating. A number of disease management interventions have been developed that recognize one or more of the premises reflected in this model (see, e.g., Karoly and Kanfer).

A TEST OF THE MODEL

We have tested aspects of this disease management model in patients with asthma. Further testing was undertaken with children and their parents seeking care for asthma from general practice pediatricians in Michigan and New York. The study first explored the extent to which self-regulatory elements (observation, judgment, reaction) were consistently associated with each other over time as assumed in the model. This analysis sought to test the stability of the central features of the model. The second exploration examined whether self-regulatory processes and other elements of the model were associated with subsequent disease management outcomes. This exploration tested the extent to which any of the six model elements (intrapersonal factors, external factors, management strategies, judgment, observation, reaction) at baseline predicted important asthma end points (quality of life, severity of disease, hospitalizations, emergencies, and physician visits) at a subsequent time.

METHOD

Sample

The study sample used to test the stability and predictive ability of the model consisted of 637 children with asthma and their caretaking parent seeing 74 community-based pediatricians in the New York City and Ann Arbor, Michigan, environs. The larger evaluation research project that provided access to this sample has been described elsewhere. Children enrolled in the study met the following criteria: 1 to 12 years of age, diagnosis of asthma made by a physician, no other chronic disorders with pulmonary complications, and at least one emergency medical visit for asthma in the previous year. An emergency visit was a hospitalization, emergency department (ED) visit, or physician office visit on an emergency basis defined as administration of epinephrine subcutaneously or
bronchodilators by aerosol. Names of patients meeting criteria were selected by the investigators at random from the rosters provided by each physician. Physicians constituted a convenience sample of clinicians willing to participate in the study. The parents (one per family) and patients comprise a random sample drawn from across the physicians’ practices.

Characteristics of patients and their parents were as follows: 70% of the patients were boys, 7% were less than 2 years of age, 59% were between 2 and 7, and 34% were 8 to 12 years of age at baseline. Sixty percent of the parents were between 30 and 39 years of age, 75% were married, and almost 90% had at least a high school education. Approximately 20% of the families had less than a $20,000 annual income, 16% were at or below the poverty level (≤$15,000 a year), and 17% were on some form of government assistance for health care during the period of baseline data collection. Thirty percent of the families were Latino/Hispanic (15%) or African American (15%).

Data Collection

At baseline, all parents were interviewed at home by trained telephone interviewers who were monitored closely by a supervisor. Subsequently, first follow-up telephone interviews were conducted during a 22-month period, beginning on average 6 months from the parents’ baseline interview. A total of 472 parents were interviewed at first follow-up. Second follow-up interviews were conducted in the same manner 1 year after the first follow-up, and a total of 369 parents completed interviews at that time point. Factors most associated with study attrition were moving from the area with no forwarding information and disconnecting of telephones.

Measures

Specific items for the interview questionnaire were developed to assess the parents’ self-regulation abilities related to managing a child’s asthma symptoms, and other aspects of the model related to intrapersonal and external resources, management strategies and end points, that is, the goals thought to motivate efforts to be self-regulating. These measures were as follows.

Observation

Did the parent routinely look for early warning signs of an asthma attack, watch the child closely when symptoms began, observe the child to see if symptoms improved, watch closely after giving medicine? Answers to these questions were scored using a Likert-type response scale of 1 (never) to 5 (always). Together, the items produced a Cronbach alpha statistic of .77.

Judgment

Did the parent do the following: decide on his or her own that the medicine needed to be adjusted or changed, use criteria for changing the medicine dose or type in response to changes in the asthma, distinguish things in the child’s environment most likely to trigger symptoms, evaluate environmental changes to determine their impact? The same response scale was used for these items and the Cronbach alpha for the set of items was .62.
Reactions

Both self-efficacy and outcome expectation were considered.

**Self-efficacy.** How confident was the parent that he or she could prevent the child from getting symptoms, keep symptoms from getting worse, stop symptoms without a visit to the physician, take care of asthma in general? Again, a Likert-type response scale was used from 1 (not at all sure) to 5 (very sure). The Cronbach alpha for self-efficacy items was .70.

**Outcome expectation.** Did the parent think specific disease management strategies would work to control symptoms, that is, (1) giving prescription medicine when symptoms appear, (2) staying calm and keeping the child calm, (3) getting the child to rest when symptoms are evident, (4) identifying environmental triggers to symptoms, (5) removing the child from the source of symptoms, (6) giving medicines before the child has contact with something that might cause symptoms, (7) keeping the child away from irritants and allergens, (8) asking for help and advice? On the Likert-type response scale, 1 indicated that this strategy would never work and 5 that it would always work. The Cronbach alpha for these items was .80.

Management Strategies

The management measures were the items listed above related to prevention and management of an asthma attack. The response question was “How often do you do this?” Prevention strategies were Items 5, 6, 8, plus the item “use a peak flow meter to anticipate an attack?” Disease control strategies were Items 1, 2, and 3. Cronbach’s alpha for prevention strategies was .45 and for disease control strategies was .61.

Intrapersonal Factors

**Knowledge and beliefs assessed** were those suggested as central to effective asthma control.15 These items were answered as true (T) or false (F): In an asthma attack, muscles around the airways squeeze them partly shut (T), inflammation in the airways is a cause of symptoms (T), bronchodilators are safe to use whenever one feels they are needed (F), one can feel anti-inflammatory medicine working (F), asthma is a disease caused by emotions (F), a child with asthma should be free of symptoms (T), a child with asthma can be fully active physically (T), asthma attacks can be prevented (T). Three items were included related to the parent’s level of information about treatment: I know the child’s short-term treatment plan, I know the child’s long-term treatment plan, I know how to make decisions about managing the asthma. Cronbach’s alpha for these combined items was .82.

External Factors

The availability of role models was assessed by an item inquiring about the presence of immediate family members or close friends with asthma. Social support was measured by four items inquiring about the availability of support and help with daily asthma control tasks, help with the demands of asthma care, one to provide love and affection, one to talk to about concerns. Cronbach’s alpha for the social-support items was .77.
Technical advice and service was measured by 13 items. These inquired as to whether the family had been given a written treatment plan by the clinician, a letter describing clinical recommendations to provide to the child’s school: asthma education materials, an asthma daily record/log book. They included questions regarding whether the child’s clinician had talked about the child’s specific asthma problems, made clinical instructions easy to follow, fit the medication schedule into the child’s daily routine, gave specific needed information, spent enough time with the family, and looked into the family’s asthma management efforts. These items were rated on a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). Cronbach’s alpha for these items was .65.

Outcomes/End Points

There was no item that tapped the parent or child’s covert personal goal for asthma management. However, data on five goals of therapy were available: (1) a rating by parents of the quality of his or her life in answer to the question “Overall, in the past 12 months, would you say that your child’s asthma interfered with the quality of your life?” (a 5-point scale from not at all to a lot was used); (2) the severity of asthma in the previous year reported by parents; (3) the number of hospital admissions in the past 12 months; (4) the number of ED visits for asthma in the past 12 months; (5) the number of office visits to follow up an asthma episode in the past 12 months.

Data Analysis

Analyses addressed two questions related to the model. The first question was, Which self-regulatory elements were related and stable within the model? Exploration of this question entailed cross-sectional analysis of data for associations between elements at three separate points of time (baseline, midpoint, end point). The second question was, Which elements of the model predicted outcomes over time? For exploring the relationship between the basic elements of the model (intrapersonal factors, external factors, management strategies, judgment, observations, and reactions [confidence and/or outcome expectations]) to endpoints, 18 variables were created using mean scores for each element from parents’ data collected at baseline and the second follow-up. Second follow-up data were employed to ensure sufficient passage of time to assess changes in health care use over time, that is, a minimum of 18 months. Cumulative logistic regression (CLR) models were used to analyze the relationships between the elements both at one time point and across time points. For the analyses of the associations between end point outcomes and self-regulation elements, CLR models were conducted. For the outcomes related to children’s health care use, Poisson regression (PR) models were employed with an offset variable to account for different lengths of time for which Poisson outcomes were counted. For both the CLR and PR models, generalized estimating equations (GEE) techniques were used to account both for clustering of patients that may occur as a result of several seeing the same physician and for unbalanced data due to drop-out over time. Sociodemographic variables (age, ethnicity, income) were included in the first model and proved nonsignificant. They were then excluded to fit the best model. The same outcome variable at baseline was controlled in all of the analyses. Furthermore, as approximately half of physicians of these patients took part in an asthma continuing education program as part of the larger evaluation research project, participation in this intervention was controlled in all analyses. Parents and patients were blind to physicians’ participation in education.
FINDINGS

Stability of Self-Regulatory Factors

Figure 3 presents cross-sectional correlations between self-regulatory factors (observation, judgment, reaction) at three different points in time: (1) baseline; (2) the first follow-up data point, that is, at least 6 months subsequent to baseline; and (3) at the second follow-up data point 1 year after the first. A consistent pattern is evident at each of three separate time points. The ability to make judgments about asthma management correlates with efforts to observe the child in various asthma-relevant situations (.535, p = .000; .399, p = .003; .447, p = .000). Making observations consistently correlates with using more asthma management strategies (.357, p = .000; .464, p = .000; .624, p = .000). Significant associations were also seen between judgment and use of management strategies (.175, p = .000; .184, p = .000; .126, p = .000), and judgment and confidence (.021, p = .000; .299, p = .000; .191, p = .004). An association was also observed between external factors and confidence (.015, p = .042; .161, p = .000; .251, p = .018). No consistently significant correlations between other predictive model elements were evident at each of the three time points.

Model Elements as Baseline Predictors of Outcomes 2 Years Later

Figure 4 depicts findings of analysis of longitudinal data to assess the ability of each element of the model to predict one or more of five asthma-related outcomes. Correlations are also provided in Table 1 and indicate several relationships. External resources (role models, technical advice and service, material resources, etc.) were negatively associated with the severity of a child’s asthma (−.290, p = .000). The lower the level of family resources at baseline, the greater the seriousness of the child’s disease 2 years later reported by parent. External resources were also negatively correlated with use of emer-
gery services for asthma (−.969, p = .011). Families with fewer resources at baseline made more urgent visits for asthma 2 years subsequent.

Two of the three self-regulatory elements of the model were significantly associated with outcomes. The higher the parent’s baseline score for observing the child in asthma-related situations, the higher his or her quality-of-life score almost 2 years later (−.537, p = .036), that is, the less the asthma interfered with the quality of his or her life. The greater the parent’s level of confidence to manage asthma at baseline, the lower the subsequent use of emergency services (−.524, p = .003) and the less frequently the family made physician visits to follow up the child’s asthma episodes (−.394, p = .007). Judgment and intrapersonal factors at baseline were also marginally predictive of physician visits. The higher the judgment score (−.722, p = .060), the fewer follow-up visits to the doctor’s office. The higher the intrapersonal score at baseline, the greater the number of follow-up visits (−.365, p = .055). Management strategies at baseline did not predict outcomes 2 years later.

**DISCUSSION**

These data show that the three self-regulatory elements (observation, judgment, reaction) posited in the model were significantly associated at each measurement point. At
three different times, the elements clustered into a similar pattern of association. The strongest correlations were seen between observation and judgment. Both factors were associated with use of disease management strategies, and as would be expected, the more one used these strategies, the more one engaged in observation and judgment. Making judgments was in one sense the fulcrum of the self-regulation process. A relationship was evident between being observant and making judgments and between judgment and confidence (self-efficacy), although no statically significant direct link between being observant and having confidence was noted.

The element of external resources was shown to influence self-regulation, that is, self-efficacy was associated with the presence of external factors (technical advice and service, material resources, role models, etc.). The relationship between confidence and external factors may reflect the need for a person managing a chronic disease to have criteria and encouragement for assessing his or her own performance as a manager. These standards and support are often provided directly by the clinician treating the disease or indirectly by others in the person’s social environment. In addition, the availability of resources may reinforce the person’s sense that he or she can exert control over the management situation. The level of external resources available at baseline also predicted the severity of a child’s disease 2 years later. The availability of money and access to care no doubt influence the technical help and medicine obtained. No relationship between external factors and other self-regulation elements was evident.

Higher intrapersonal scores predicted more subsequent visits to the physician to follow up an episode of asthma symptoms. There was no association between intrapersonal factors (knowledge, attitudes, feelings, beliefs) and other model elements. These findings could be a result of the measures employed. Perhaps the items used to assess the construct for this analysis did not capture the type of information, beliefs, feelings associated with self-regulatory processes, use of management strategies, or desired outcomes, for example, quality of life. Perhaps there were accompanying worries or anxiety that motivated

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*p < .06.
people to seek the physician’s assistance that measures did not tap. On the other hand, a large body of research has shown that knowledge and beliefs about health and disease are often not associated with behavior as conventionally expected. The data presented here suggest that other factors (e.g., self-regulatory processes) are more salient in disease management and achieving desired outcomes.

Confidence has frequently been suggested as an important aspect of successful health behavior. The data presented here did not show direct association between self-efficacy and use of management strategies in cross-sectional analyses of model elements, although confidence did predict important outcomes. As Bandura and others have noted, the self-efficacy reaction is very specific to a given task. It may be that the management strategies assessed here were not sufficiently specific to tasks as presented in study variables, that is, tasks other than those needed to avert an emergency or hospitalization.

When end points of the model were considered, the self-regulatory elements measured at baseline were predictive of important outcomes. Being observant was linked in the expected direction with the person’s rating of the quality of his or her life. Judgment was marginally associated with another important outcome: fewer physician visits subsequent to an episode of asthma, again, in the expected direction. Self-efficacy was also associated in the expected direction with physician follow-up visits. It was also predictive of emergency department visits, suggesting that higher levels of confidence reduce the likelihood of seeking urgent care.

Overall, the model performed reasonably well when judged by the stability of its central self-regulatory elements and the ability of those elements at baseline to predict end points 2 years later. Several speculations can be ventured based on these findings:

1. The abilities to observe, judge, and react appropriately are interrelated and reciprocally reinforcing. Observation and judgment are directly associated with the use of disease management strategies.
2. Disease management strategies may indirectly influence end points by sharpening skills of observation and judgment, that is, by serving to enhance learning from trial and error.
3. Intrapersonal factors when measured as having needed knowledge, beliefs, and feelings commonly associated with disease management are less important in disease control than having self-regulatory skills.
4. Health care use is influenced by the ability to make judgments and one’s level of confidence, while quality of life is influenced by one’s observations.
5. External factors, likely because they enhance self-regulation, are significant in reducing disease severity and health care use (both need for urgent care and physician visits subsequent to disease flare-ups).

The study is limited in several ways. We do not have data to assess the relationship of personal goals to self-regulation elements, and this is an important aspect of the model. Furthermore, the sample of individuals studied, while random, is not necessarily representative and may not be generalizable to all those managing asthma nor may their experience be generalizable to other diseases. The study is also limited in that a one-item measure of quality of life was employed that assessed interference with quality attributable to the child’s asthma. A multi-item measure may provide a stronger picture of the range of factors that comprise quality of life.
Other models of behavior, of course, could be used to explain outcomes relevant to control of chronic disease. We developed this model in an effort to delineate the discrete elements of self-regulation (observation, judgment, reaction). These are aspects of human behavior that lend themselves to modification through education and other strategies designed to enhance them. The model deserves further exploration in asthma. It also may apply to other chronic diseases that require continuous management. Assessment of interventions designed to enhance elements of the model, including evaluation of the extent to which end points are reached, may be warranted.

Implications for Practice

There are several ways in which program development may be enhanced given findings of this research. For example, the advantage of focusing an intervention on the three self-regulatory processes as opposed to providing content (information, knowledge) seems clear. This is not to say that information is not needed by the person managing a chronic disease. Rather, the information required is sought as relevant in the process of observing, judging, and reacting to a disease management situation. Health educators can enable individuals to build their observation skills (e.g., through suggesting various means of self-monitoring), ability to make judgments (e.g., by establishing criteria for making assessments), and capacity to react appropriately (e.g., by encouraging realistic evaluations of self-efficacy and analysis of means-ends relationships). They can organize information and make it available in a timely way as learners need it in the self-regulatory process and as they move toward their personal goals.

Program developers may also design an intervention in such a way that learners have the opportunity to try a range of management alternatives. Attempts to manage may enable learners to hit upon or adapt an existing strategy that is more likely to help them control disease. Furthermore, trying out alternatives may improve the basic skills of self-regulation.

Self-efficacy may be a good starting point when designing an intervention. Program features (e.g., trying out new behavior in safe circumstances, providing realistic benchmarks against which a learner measures performance) could foster the confidence needed to make good disease management judgments, and making good judgments in turn will increase confidence.

Finally, diligent attention to aiding learners to acquire the external resources they need to be effective in disease management appear to be a necessary component of most, if not all, disease management interventions.

References

Contributions of Community Involvement to Organizational-Level Empowerment: The Federal Healthy Start Experience

Meredith Minkler, DrPH
Mildred Thompson, MSW
Judith Bell, MPA
Kalima Rose, PhD

This article presents findings of a multisite case study of the experience of nine federal Healthy Start Program sites in using consortia and other community involvement strategies in the fight against infant mortality. Using empowerment theory as a conceptual framework, qualitative data are employed to examine how community involvement in the program through community-based consortia and other means contributed to empowerment at the organizational level. The article concludes with implications of the study findings for practice both within Healthy Start and in the context of other community-based health initiatives.

Community initiatives frequently operate within a “catalyst for change” model, attempting to “transform relevant sectors of the community, changing programs, policies and practices to make healthy behaviors more likely for large numbers of people” (p. 7). Often, such models are based on theories of empowerment and stress multiple interrelated activities, including collaborative planning, community action, and institutionalization of change processes and outcomes.1

A critical intermediate variable between community health intervention programs and the achievement of health outcomes is believed to lie in the ability of these programs to enhance community capacity and create conditions that facilitate empowerment.1-6 As Kreuter et al.7 have pointed out, however, “health systems and health status change are not only difficult to achieve, but also difficult to detect—at least in a form that is attributable to any particular intervention” (p. ii). Yet, as they go on to note, collaborative work,

Meredith Minkler is a professor in the School of Public Health at the University of California, Berkeley. Mildred Thompson is a senior policy fellow, Judith Bell is vice president, and Kalima Rose is a senior associate at PolicyLink, Oakland, California.

Address reprint requests to Meredith Minkler, School of Public Health, University of California, Berkeley, CA 94720-7360; phone: (510) 642-4397; fax: (510) 643-8236; e-mail: mink@uclink4.berkeley.edu.

The authors gratefully acknowledge the contributions of other members of the PolicyLink project team: Zita Allen, Janet Dewart Bell, Angela Grover Blackwell, Modupe Carpenter, and Heather Bent Tamir. Special thanks also are due to members of the study’s advisory board for their helpful input, to Research Assistants Dina Redman, Chris Roebuck, and Lisa Butler, and to Laura Spautz for secretarial assistance. We are grateful to the editor and the anonymous reviewers whose suggestions greatly strengthened this article. Finally, our sincere thanks are offered to Health Resources and Services Administration staff and consultants, and to the many individuals at participating Healthy Start sites whose sharing of their time and insights made this study possible.

Health Education & Behavior, Vol. 28 (6): 783-807 (December 2001)
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including community involvement through consortia and coalitions, may have important by-products, including “individual and community capacity, increased levels of trust [and] responsiveness to community needs.” These by-products, which often reflect increased individual, organizational, and community empowerment, are increasingly viewed as “worthwhile intermediate payoffs” in and of themselves (p. iii).

This article will present the National Healthy Start Program (NHSP) as an example of a program with a mandate that explicitly promotes empowerment at multiple levels. To achieve its goal of dramatically reducing infant mortality in high-risk communities, the NHSP encourages individual, community, and organizational empowerment through community involvement.8

Using qualitative data from a study of nine Healthy Start sites across the country, this article will illustrate how community involvement in the NHSP contributed to empowerment at the organizational level, principally through the development and nurturing of community-based consortia. Although the various levels of empowerment are closely interrelated, we have chosen to focus on empowerment at the intermediate or organizational level, since the heavy accent placed by Healthy Start on community-based consortia represents perhaps the most unique aspect of the program.

The study on which this article is based9 was conducted by staff and associates of PolicyLink, a national policy, research, communications, and capacity-building organization founded in 1999. PolicyLink’s stated goal is to advance a new generation of policies, guided by the wisdom and experience of local constituencies, to achieve social and economic equity and build strong organized communities. This goal made community involvement in Healthy Start a logical topic for study. Following a brief review of the NHSP and its emphasis on community involvement, empowerment theory will be presented as a broad conceptual framework for the study. Our research questions and methods then will be described, followed by findings concerning organizational-level empowerment at the nine Healthy Start sites examined and implications for policy, practice, and further research.

THE NATIONAL HEALTHY START PROGRAM

The United States ranked 22nd in the world in infant mortality when the Healthy Start Program was launched in 1991, and Black babies were dying at more than twice the rate of White babies.10,11 Established with the goal of reducing infant mortality by 50% in 5 years within 15 demonstration sites where infant death rates were at least 15.7 per 1,000 live births, the program is administered by the Health Resources and Services Administration’s (HRSA) Maternal Child Health Bureau.8 The NHSP was backed by substantial funding (the allocation for 2001 is $90 million)12 and committed to an approach that included a heavy emphasis on community involvement. Indeed, as Badura8 has noted, the program was “founded on the premise that the communities themselves could best develop the strategies necessary to attack the causes of infant mortality and low birth weight, especially among high risk populations” (p. 263).

One criterion by which sites were selected by HRSA for participation in the program was the degree of consumer and community involvement demonstrated in their application process. HRSA’s initial Guidance for the Healthy Start Program13 emphasized this approach, stating,
Consumer participation must be a central consideration in organizing a Healthy Start project. The participation is expected to be substantive and informed. It should begin with the initial conceptualization of the project and continue through all stages including original organization, planning and development, implementation and evaluation. (p. 4)

The grantee agency for each Healthy Start award (e.g., a health department, nonprofit organization, or other entity) was required to organize a consortium whose composition reflected a partnership of consumers, service providers, both public and private community groups, and other stakeholders. In recognition of the role that community capacity building may play in helping to address major health and social problems, the Guidance for the Healthy Start Program further stated that “in addition to system change and service integration for women and infants,” each Healthy Start program must be able to “explain the impact the project has had on developing and empowering the community” (p. 10). The areas in which such empowerment was to be demonstrated included establishing a mechanism for community participation, enhancing community problem-solving skills, providing leadership training, and creating jobs in the community.

While allowing for considerable flexibility in how these goals were to be met, the very requirement that Healthy Start projects address empowerment as a central part of their modus operandi yielded considerable attention to this intermediate variable within project planning and evolution. Healthy Start sites, which had grown in number to 94 by the late 1990s, were instructed by HRSA not to supplant existing funding streams but to be creative in their use of resources. The program’s broad vision of empowerment was further reinforced in the program Guidance for the Healthy Start Program issued in 1996 with respect to the evaluation of Healthy Start programs. Evaluators were instructed to include in their analyses “empowerment training of community leaders, creation of jobs within the community and leadership training of front-line workers and consumers” (p. 10).

Healthy Start’s program offerings included flexible dollars and program design, a 9-month planning process, the freedom to address community-identified needs, and mandated community involvement. All of these features signaled a new era in comprehensive, client-based service delivery. As Howell et al. have suggested, however, it was the emphasis of Healthy Start on community involvement that was probably its “defining feature,” setting it apart from other maternal child health programs.

In October 2000, after 9 years in the demonstration phase, Healthy Start was authorized as a permanent program when President Clinton signed into law the Children’s Health Act of 2000. Because the act specifically mandated community involvement as a central program feature, new research focused on Healthy Start’s experience with community involvement is particularly timely for this program and other community health initiatives.

The present study builds in part on earlier research on the Healthy Start experience by Plough and Olafson as well as Howell and her associates. The former study provided a detailed case study of the first 2 years of one of the original Healthy Start sites (Boston) from a community empowerment perspective. The authors explored the difficulties and successes experienced, as well as the power dynamics and conflicts they found to be “inherent in a model that is defined and controlled by the federal government and that simultaneously calls for substantial community participation and control” (p. 232).

In their more recent analysis of community involvement in the 15 original Healthy Start sites, Howell et al. identified and contrasted a service consortium model (e.g.,
where the community was involved primarily through a consortium of local providers) and a community empowerment model (e.g., involving a broad range of community stakeholders and strategies, including contracting with local community-based organizations, hiring and training lay health workers, and fostering community economic development).

Although each Healthy Start site was seen as having borrowed from aspects of each model, the different sites also each appeared to reflect primarily one or the other of these models. Howell et al. suggested that despite the many difficulties confronted by the various projects in attempting to involve community, “most have shown a true commitment to the process and feel that any improvement in prenatal care and birth outcomes will be due, in part, to the degree to which the community involvement strategies succeed” (p. 312).

The present article complements this earlier work by examining the ways in which Healthy Start consortia and other community involvement strategies were employed to enhance organizational empowerment and capacity building at eight of the original Healthy Start sites, as well as one of the newer program sites.

CONCEPTUAL FRAMEWORK

Empowerment theory constituted a broad theoretical framework for this study. A multilevel construct, empowerment is defined by Rappaport as an enabling process through which individuals and communities take control over their lives and their environment. As Wallertstein has noted, it is “a social action process by which individuals, communities and organizations gain mastery over their lives in the context of changing their social and political environment to improve equity and quality of life” (p. 198).

Regardless of the level of empowerment being considered, Zimmerman suggests that three key factors—participation, control, and critical awareness—are involved. At the individual level of analysis, these factors include a person’s belief in his or her ability to exert control, involvement in decision making, and an understanding of causal agents. Similarly,

Applying this general framework to an organizational level of analysis suggests that empowerment may include organizational processes and structures that enhance member participation and improve organizational effectiveness for goal achievement. At the community level of analysis, empowerment may refer to collective action to improve the quality of life in a community and to the connections among community organizations and agencies. (p. 44)

From the perspective of community-based interventions like Healthy Start, these diverse levels of empowerment are unified by the belief that “the primary goal of community practice is not to help individuals or communities to accept or adjust to problems but to help them develop the ability to change negative situations and prevent the recurrence of problems” (p. 63). However, and while acknowledging their interrelated nature, exploring each level of empowerment independently can help us understand its characteristics and processes within these different domains. As noted above, this article focuses chiefly on the organizational level of empowerment, with community involvement through consortia as the primary focus of analysis.

For the purposes of this study, a community-based consortium is defined as

a partnership of organizations and individuals representing consumers, service providers, and local agencies or groups who identify themselves with a particular community, neigh-
neighborhood, or locale and unite in an effort to collectively apply their resources to the implementation of a common strategy for the achievement of a common goal within the community. (p. 72)

Although having much in common with coalitions, consortia include individuals as members, while coalitions typically are defined as having only organizations as members. The original Guidance for the Healthy Start Program, for example, included the stipulation that “the consortium must include representation that reflects a partnership of consumers, providers of services and community organizations and groups, both public and private” (p. 10).

Earlier research has helped illuminate the linkage between participation in voluntary organizational entities and empowerment. A popular definition of citizen participation as “a process in which individuals take part in decision making in institutions, programs and environments that affect them” (p. 339) thus has much in common with the definitions of empowerment cited above. As Wandersman and Florin have noted, participation in voluntary community organizations can be empowering because of its relationship to “higher competencies, confidence, sense of citizen duty and lower feelings of helplessness” (p. 45). Although consortia are not single organizations, participation in such entities similarly can be empowering for both individual and organizational members. Participation thus is critical in designing programs, plans, or environments that reflect local values and concerns while increasing participants’ sense of control over the environment and their “feelings of helpfulness and responsibility” (p. 265).

In examining the extent to which Healthy Start sites and their consortia contributed to empowerment at the organizational level, we use Zimmerman’s conceptualization of empowering and empowered organizations. As he has noted,

A distinction must be made between what the organization provides to members and what the organization achieves in the community. Organizations that provide opportunities for people to gain control over their lives are empowering organizations. Organizations that successfully develop, influence policy decisions, or offer effective alternatives for service provision are empowered organizations. (p. 51, emphasis added)

While the notion of an empowering organization refers to a process, the empowered organization may be seen as an outcome. We use Zimmerman’s characteristics of potentially empowered organizations as including the following (see Table 1):

- Successful growth and development
- Effective competition for resources
- Partnering or “networking with other organizations”
- Influencing policy decisions

In our analyses of organizational empowerment as process, we also draw from the work of Maton and Salem, who have elucidated four organizational characteristics of empowering community settings:

- A culture of growth or belief system that “inspires growth, is strengths-based, and is focused beyond the self”
- The provision of opportunities for participants to occupy diverse and meaningful roles
As a support system that is “encompassing, peer-based, and provides a sense of community”

Collaborative leadership “committed to both setting and members” (p. 631)

Finally, we draw from the work of Fawcett et al. who elucidated four important strategies for facilitating the empowerment process and related outcomes: “(a) enhancing experience and competence, (b) enhancing group structure and capacity, (c) removing social and environmental barriers, and (d) enhancing environmental support and resources” (p. 679). In this article, we draw on study themes (see Table 2) and other findings to demonstrate how various combinations of these strategies could be observed at many of the Healthy Start sites and consortia examined in relation to empowerment processes and outcomes at the organizational level.

Table 1. Empowering Strategies, Processes, and Outcomes at the Organizational Level

<table>
<thead>
<tr>
<th>Strategies for Facilitating Empowerment</th>
<th>Process: Empowering Organizations</th>
<th>Outcome: Empowered Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance experience and competence</td>
<td>Remove social and environmental barriers</td>
<td>Successful growth and development</td>
</tr>
<tr>
<td>Enhance group structure and capacity</td>
<td>Enhance environmental support and resources</td>
<td>Effectively competing for resources</td>
</tr>
<tr>
<td>Culture of growth and community building</td>
<td>Opportunities for members to take on meaningful and multiple roles</td>
<td>Networking with other organizations</td>
</tr>
<tr>
<td>Peer-based support system that helps members develop a social identity</td>
<td>Shared leadership with a commitment to both members and the organization</td>
<td>Influencing policy</td>
</tr>
</tbody>
</table>

a. Adapted from Fawcett et al. (1995).
b. Adapted from Maton and Salem (1995).
c. Adapted from Zimmerman (2000).

RESEARCH QUESTIONS

Central to our study were four questions:

1. What is the nature and functioning of the community involvement component at each Healthy Start site examined?
2. What conditions and processes contribute to well-functioning consortia and other community involvement efforts? What barriers and obstacles impede such functioning?
3. How do Healthy Start directors, consortia chairs, and other key informants at each site view the community involvement component of the program and judge its quality and relationship to outcomes?
4. Did the community involvement component of Healthy Start result in, or contribute to, systems or community changes such as new or modified programs, policies,
or practices? If so, what were the changes or modifications, and in what specific ways were the consortia or other community involvement approaches involved?

Although it is beyond the scope of this article to address each of these research questions (see Thompson et al. 2000), we draw on findings related to aspects of each question as they inform our understanding of the contribution of community involvement to organizational-level empowerment through Healthy Start.

METHOD

A multisite case study design was identified as the best method for addressing the project’s research questions. This approach also was selected because although we anticipated finding some important commonalities across sites, each Healthy Start program examined would have contexts, conditions, and processes of change that would require in-depth exploration as we focused on the area of community involvement.

Role of the Advisory Committee

To create a working partnership that would foster critical discussion, planning, review, and implementation of the project’s goals, a 15-member advisory committee was constituted and actively involved in study design, questionnaire construction, and other aspects of the project. The advisory group included individuals knowledgeable about Healthy Start and community involvement, researchers, policy advocates, physicians, and Healthy Start program participants and consortia members from several of the study sites. Although the full advisory board met with the project team only twice, individual members and subgroups were consulted as needed throughout the project period and provided

Table 2. Cross-Cutting Themes

<table>
<thead>
<tr>
<th>Themes Identified by All Three Reviewers</th>
</tr>
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<tbody>
<tr>
<td>The diversity of consortia structures and community involvement strategies</td>
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<tr>
<td>Emphasis on community empowerment and capacity building</td>
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<tr>
<td>Attention to the community’s felt needs and concerns</td>
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<tr>
<td>Race- and class-based tensions and efforts to address them</td>
</tr>
<tr>
<td>Provider-consumer tensions and their playing out in the consortia</td>
</tr>
<tr>
<td>The prominent role of training and health education</td>
</tr>
<tr>
<td>The impact of contextual factors such as environmental and demographic changes</td>
</tr>
<tr>
<td>The role of community involvement in new program development</td>
</tr>
<tr>
<td>Barriers and challenges to community involvement</td>
</tr>
<tr>
<td>Institutionalization of new or modified programs or practices</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Themes Identified by Two Reviewers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formation of alliances and partnerships</td>
</tr>
<tr>
<td>Stories of success from the individual to the community level</td>
</tr>
<tr>
<td>Limited articulation of the role of community involvement in influencing policy</td>
</tr>
</tbody>
</table>

a. Adapted from Thompson et al. (2000).
crucial feedback on site selection and study design, interpretation of findings, and development of recommendations and study products.

**Site Selection**

Site selection was undertaken with the goal of achieving a sample that was diverse along multiple dimensions and that was suitable for addressing our research questions as outlined above. We wished to include, for example, both urban and rural sites; sites with different levels of achievement of health outcome objectives; and sites that were sources of both positive lessons and lessons concerning barriers, tensions, and areas for improvement. Nine sites were selected in consultation with staff at the National Healthy Start Office and our advisory committee: Boston, Chicago, Cleveland, Kansas City, Philadelphia, Pittsburgh, New Orleans, New York City, and Pee Dee (South Carolina). With the exception of Kansas City, each site was among the original 15 selected for participation in the NHSP.

**Development of Data-Gathering Instruments**

A standardized semistructured questionnaire for key informant interviews was developed by the project director and research consultant and extensively modified based on pretesting in a nonparticipating Healthy Start site (Oakland, CA) and input from the advisory committee and consultants at the NHSP Office. The final instrument included 29 questions, several with a number of subparts, under the subheadings Consortium, Processes of Community Involvement Beyond the Consortium, and Outcomes and Side Effects of Community Involvement. The schedule included questions concerning how community and community involvement were defined at each site; consortia history, membership, and nature and levels of participation; selection criteria; and factors contributing to, and impeding, consortia functioning. Questions concerning community involvement beyond the consortia, opportunities for training and upward mobility, and both positive and negative outcomes and side effects of community involvement in Healthy Start also were included.

A seven-item focus group guide also was developed by the project director and research consultant, with considerable input from the advisory committee. Questions concerned general background and personal history of involvement with the program, nature and scope of any training received, perceptions of consortia functioning and responsiveness to the participants’ concerns, and suggestions for improvement. Respondents further were asked to describe whether there had been changes in themselves, their families, or their community as a result of their being Healthy Start participants and/or consortium members, and if so, to describe these changes.

**Site Visits**

Each site was visited during a 2-day period by the PolicyLink Project, Director Mildred Thompson, and one to three other members of the PolicyLink team, with a follow-up visit conducted for additional data collection. In addition to key informant interviews and focus groups, the site visits typically included informal meetings with additional staff, observations of consortia meetings and/or other relevant activities, and collection of project reports or other pertinent written materials.
Key Informant Interviews and Informal Meetings

At the heart of our data collection were key informant interviews, using the interview schedule described above, with between two (Cleveland) and five (Philadelphia) individuals. Interviews typically were conducted in the respondents’ offices and took 60 to 90 minutes to administer. The two key respondents at each site (project director and consortium chair) were always interviewed independently of one another to facilitate openness and an ability to compare responses. Individual or joint interviews were conducted with other staff members at most sites who were chosen to participate based on their history of involvement with the program. All subjects were informed of the voluntary nature of their participation, and interviews were recorded with their permission.

At several sites, research team members met informally with outreach workers and/or other staff members. These sessions frequently included several individuals and used questions from the formal interview schedule only to the extent appropriate for the parties concerned. They also were tape-recorded and transcribed with permission of the participants.

Focus Groups

To enable us to hear the voices of program participants and consortia members more directly, a focus group was conducted with four to nine individuals at each site. Group participants were volunteers identified by the consortium chair or a Healthy Start staff member and typically had been involved with the consortium at their site. Participants each signed a consent form and received a $50 honorarium for their participation in the 45- to 90-minute group.

Observations

Site visits typically were scheduled to coincide with consortium meetings or subcommittee meetings and/or other relevant events that the research team could observe. Efforts also were made to visit family resource centers and other key program components as part of the data collection.

Collection of Documents and Background Data Review

An attempt was made to collect from each site written data in the form of newsletters, consortia bylaws, recent reports, newspaper articles, or other documents that might capture additional insights about the community involvement component of the project. Because of considerable variability between sites, comparable materials often were not available from each program.

Data Management and Analysis

Following each site visit, the project director developed a one-page overview, summarizing information for each site under headings including Fiscal Agent, Consortia, Committees, Structure, Governance, Program, and Unique Features and Outcomes (see first four columns of Table 3). To ensure accuracy and begin the process of giving data back to the community in accordance with the study’s commitment to empowerment, each of

(text continued on pg. 796)
### Table 3. Healthy Start Site Profiles

<table>
<thead>
<tr>
<th>Site</th>
<th>Fiscal Agent</th>
<th>Consortia</th>
<th>Consortia’s Role in Governance</th>
<th>Program Features</th>
<th>Sample Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pittsburgh</td>
<td>Allegheny County Health Department; passes funds</td>
<td>Regional model with one consortium in each of six target areas</td>
<td>Policy decisions on type and level of services Input on budget and personnel decisions</td>
<td>Case management model in six service areas Drug and alcohol prevention</td>
<td>New member orientations and formal written evaluations of each consortium meeting Codeveloped two new residential treatment programs Formed 501c3</td>
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<tr>
<td></td>
<td>through to Healthy Start nonprofit</td>
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<td></td>
<td>Male initiative</td>
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<tr>
<td>Philadelphia</td>
<td>Philadelphia Department of Public Health, Maternal</td>
<td>Very strong consumer participation model with six committees</td>
<td>Policy decisions on type and level of services</td>
<td>Outreach model with risk reduction and adolescent focus</td>
<td>Daylong event to build trust between providers and community members of consortium</td>
</tr>
<tr>
<td></td>
<td>Child Health</td>
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<tr>
<td>Boston</td>
<td>Boston Public Health Commission</td>
<td>Very strong consumer participation model with seven committees</td>
<td>Policy decision on type and level of services Influence on outreach strategies and marketing tools</td>
<td>Case management with strong home visitation component</td>
<td>Strong leadership training with requirement of participation in another community initiative</td>
</tr>
<tr>
<td>Chicago</td>
<td>State of Illinois, Department of Human Services</td>
<td>Very strong consumer participation model with three committees</td>
<td>Policy decisions on type and level of services</td>
<td>Five family resource centers and subcontractors Prison-based program for pregnant and parenting women</td>
<td>Consumer conference on issues identified by participants</td>
</tr>
<tr>
<td>Location</td>
<td>Type</td>
<td>Details</td>
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<tr>
<td>Kansas City</td>
<td>Heart of America United Way</td>
<td>Strong provider representation with three committees, no involvement in governance, case management, enhanced clinical services, outreach, training, and education. Accent on cultural sensitivity (e.g., consortium-sponsored conference on working with growing Hispanic population). Consortium helped expand teen pregnancy prevention program in local schools.</td>
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<tr>
<td>Cleveland</td>
<td>Cleveland Department of Public Health</td>
<td>Eight sites serving 15 neighborhoods, executive council and administrative management group makes policy decisions, case management and health education in correctional facilities, mobile health clinic. Participants work with business representatives and other stakeholders on consortium leadership committee. Outreach workers came to consortium to devise new housing partnerships. Consortium graduates began neighborhood forum; meets bimonthly and works with other groups.</td>
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<tr>
<td>Pee Dee</td>
<td>Private, nonprofit</td>
<td>Separate consortia for providers and consumers, now working more closely together, additional consortia focused on men. Agency’s board of directors makes governance decisions, rural program that serves six counties, primarily an outreach model. Male component educates fathers and potential fathers. Creation of bus system to enable resident attendance at consortium meetings and other activities. Beginning formation of leadership role in advocacy for health insurance for region’s part-time workers. Formed 501c3. Played leadership role in advocacy for health insurance for region’s part-time workers. Facilitated transfer.</td>
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</tr>
<tr>
<td>Site</td>
<td>Fiscal Agent</td>
<td>Consortia</td>
<td>Consortia’s Role in Governance</td>
<td>Program Features</td>
<td>Sample Features</td>
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<tr>
<td>New Orleans</td>
<td>City of New Orleans, mayor’s office receives funds; passes through to Great Expectations Foundation, a 501c3</td>
<td>10 Service Area Advisory Councils represented on Consortium Steering Committee 4 leadership council members and 3 consumer representatives make policy decisions on Great Expectations Board of Directors</td>
<td>Consortia Steering Committee makes recommendations on service delivery models, identifies community needs and partnerships Some input on budget and personnel decisions</td>
<td>10 target areas served at three multi-service centers Abstinence and teen pregnancy programs Case management model HIV/AIDS case management</td>
<td>Inclusive strategic planning process and follow-up allocation of migrants by consortium Two consortium members added to board of new nonprofit Data sharing and education of consumers to create critical awareness about links between IM and other problems</td>
</tr>
<tr>
<td>New York</td>
<td>Medical and Health Research Associates</td>
<td>Regional model with five citywide representatives are</td>
<td>Case management male involvement</td>
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<tr>
<td>Committee and Training</td>
<td>Domestic Violence Program</td>
<td>Community Center</td>
<td>Health Department</td>
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<tr>
<td>New York City, Inc. (grantee)</td>
<td>Harlem Local Area committees</td>
<td>makes governance-level decisions</td>
<td>Created job training center</td>
<td></td>
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<tr>
<td></td>
<td>members of city-wide consortium</td>
<td></td>
<td>Partnered with Health Department and Children’s Defense Fund on immunization campaign</td>
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<tr>
<td></td>
<td>expanded after budget cuts</td>
<td>include sessions on grant writing</td>
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*a. Adapted from Thompson et al. (2000).*
these summary pages was returned to the site’s project director and consortium chair for review and feedback. Their corrections and validation are reflected in the data that appear in Table 3 and in the Findings section.

To prevent the loss of valuable first-impressions data, site visitors also provided the rest of the research team with both a verbal and a written self-debriefing, typically within 1 week of the visit. Audiotapes from each interview and focus group were transcribed verbatim by a professional transcriber.

The primary research team members involved in data analysis were the project director, who formerly directed a nonparticipating Healthy Start site and had extensive experience with the program both locally and nationally; a consultant with expertise in community involvement and in community-based public health research; and a health education/social work doctoral student working with the consultant. Each of these individuals reviewed the transcripts independently by site to identify (1) patterns related to the project’s research questions and (2) emerging themes within each site, whether or not these were directly related to the research questions. The latter process enabled us to take full advantage of the qualitative nature of the data by remaining open to new insights and findings that, although not tapped through the research questions, might provide additional avenues for understanding the program’s community involvement component.

Considerable variability was found between sites in terms of both the nature and extent of data gathering that were possible and the applicability of portions of the main data-gathering instrument. Therefore, in lieu of a more formalized coding template, the three researchers each read the transcripts several times, using open coding to identify possible patterns and themes that were then listed as informal codes in marginal notes. Codes that emerged in this process included, for example, broad view of community, attention to community needs and concerns, racial/ethnic tensions, creative partnerships, and limited role in governance. Each reviewer then examined the codes she had identified by site to reveal those that had emerged in relation to most or all of the sites examined. She then developed her own list of 10 to 15 key cross-site codes or themes. The three sets of cross-site themes then were compared. As shown in Table 2, 10 themes were identified by all three reviewers, with an additional three themes identified by two. This high degree of interrater correspondence gave us confidence that the 13 themes identified through the open coding process represented more than a single individual’s perception of the major issues that emerged from the data at the different sites. This was particularly important since only one of the research team members (the project director) was directly involved in data collection at every site. The 13 themes identified, plus additional data from review of documents and the site visitors’ observational notes and subsequent debriefings, were then used to help address the study’s research questions. (See Thompson et al.9 for a fuller discussion of study methods and findings relevant to aspects of the research questions not addressed in this article.)

**Study Limitations**

This study had a number of limitations including the small number of participating sites (9 out of a total of 94 Healthy Start programs), the relatively brief time available for site visits, and the cross-sectional nature of data collection. The latter factor prevented us from examining consortia growth and development over time using models that have demonstrated utility in such analyses.6,7,30-32

As noted above, while the diversity of the selected sites was advantageous in helping us to examine a broad range of consortia and their programmatic and community settings,
it was difficult to design a main data collection instrument that was of comparable relevance to each site. The lack of comparable written materials for the different sites also made this aspect of data collection and analysis less helpful than the interviews, focus groups, and observational components of the study. Finally, as noted earlier, although empowerment ideally should be examined at multiple levels simultaneously, space limitations in the present article necessitated our focusing on a single level. Bearing in mind these limitations, however, this article attempts to illuminate our understanding of the contributions of community involvement in comprehensive health initiatives like Healthy Start to organizational-level empowerment.

**FINDINGS**

The major means through which Healthy Start contributed to organizational empowerment, and a key focus of this study, involved the creation, implementation, and sustaining of community-based consortia. Although each Healthy Start program was required by legislative mandate to create a consortium, there was considerable flexibility in what such consortia should look like and how they should operate. The resulting diversity of consortia structures and community involvement strategies was a primary theme identified in our study (see Table 2).

The high degree of autonomy granted to the sites by HRSA enabled several Healthy Start programs to build on preexisting organizations or networks, resulting in overall enhanced capacity or problem-solving ability. As suggested in Table 3, for example, both New Orleans and Cleveland developed a network consortium structure, bringing together in the process a number of preexisting neighborhood organizations. More often, however, the consortium was a more unitary structure with several subcommittees that engaged in varying levels of information sharing and governance. In the next section, we examine some of the ways in which these diverse consortia fit the criteria of empowering and empowered organizations.

**Healthy Start Consortia as Empowering Organizations**

At many sites, Healthy Start’s community-based consortia played the role of empowering organizations by creating settings in which people could participate, develop critical awareness, and act together to gain increased control over their lives.20 The consortia further illustrated, to differing degrees, Maton and Salem’s28 four characteristics of an empowering organization by (1) creating a culture of community and growth, (2) providing opportunities to occupy diverse and meaningful roles, (3) offering a support system fostering peer support and social identity and, (4) facilitating collaborative leadership.

Culture of community and growth. Many of the themes that surfaced in this study (e.g., the emphasis on community capacity building, attention to community-identified needs and concerns, the prominent role of training and health education, and efforts to address tensions based on race and class) were integrally related to the creation of a culture of community and growth. In Chicago, an annual 2-day Consumer Conference, which provided health education, leadership training, and opportunities for networking and celebration, was planned by the consortium’s Community Mobilization Committee and attended by 250 to 300 people. Both “enhancing experience and competence” at the
individual and group levels and “enhancing group capacity” were among the empowering strategies employed in the planning and conducting of this event.

Kansas City fostered a culture of community and growth by emphasizing cultural sensitivity, including the consortium’s hosting of a conference to address the need for increased cultural awareness and competency related to a growing Hispanic population. Both special events like these and the day-to-day emphasis on creating a sense of community among consortia members, providers, and program participants demonstrated the various site consortia’s commitment to this aspect of becoming empowering organizations.

As suggested above, an important feature of the culture of growth described by Maton and Salem involves its focus on helping members “look beyond themselves” to view themselves as part of a larger whole or mission. This reflective feature of empowering organizations complements Zimmerman’s notion of critical awareness as a vital part of the empowerment process. Many of the Healthy Start consortia fostered critical awareness or “the capacity to analyze and understand one’s social and political environment” and with it the ability to look beyond the self (pp. 46-47). Through town hall meetings, subcommittees, and other activities, the consortia provided settings where residents were encouraged to identify and discuss the interconnections between infant mortality and other problems affecting their daily lives and the life of their community. In New Orleans, bar graphs and other visual displays of data on HIV/AIDS, high school drop-out rates, and other community problems were used to educate members about the interrelationships between these and other issues of importance in their own lives. At other sites, dialogue alone was a powerful means of helping consortium members and others understand the intersections between, and root causes of, many of the problems they had identified. Arguing the need for Healthy Start to do more in the area of mental health, for example, one consumer member of the consortium reflected, “If you want healthy babies and a healthy start, you gotta have a healthy mama and a healthy environment.”

In Pee Dee, New York City, and New Orleans, critical awareness of the connection between women’s personal experience with domestic violence and the problem of infant mortality was fostered through the consortia. Follow-up actions included the training of 19 violence prevention peer educators in Central Harlem who also helped make a videotape on this topic, enhancing their experience and competence while increasing environmental support and resources. Finally, growing critical awareness was witnessed with respect to the need for greater inclusiveness, with Boston members, for example, stressing the need to include Chinatown in their Healthy Start’s target area. As will be illustrated below, such critical awareness sometimes led to collective action for change that further contributed to the perception and the reality of Healthy Start consortia as empowered, as well as empowering, organizations.

Opportunities for occupying diverse and meaningful roles. Consortia differed across sites with regard to the extent to which participants were enabled to occupy “diverse and meaningful roles” within the organization. As indicated in Table 3, most of the consortia examined included subcommittees, which typically met monthly or quarterly and afforded program participants, community members, providers, and other stakeholders an opportunity to participate in the ongoing work of the organization. In Pittsburgh, participation included consortium members playing a genuine role in establishing funding priorities, developing program plans, approving media campaigns, and even helping in the development of advertisements. In Chicago, consumer and community members were involved primarily through the consortium’s Community Mobilization Committee, decid-
ing and acting on their own program agenda and sometimes catalyzing change efforts in the full consortium as well.

Opportunities provided for consortia members at several sites included having active input in the grant application process and in decision making about budget cuts. In New Orleans, for example, a strategic planning process focused grassroots participation on measurable outcomes for reducing infant deaths, increasing high school completion, lowering violent crime, and achieving other objectives. Community-based organizations that devised plans that would specifically advance one of their strategic goals then were granted $10,000 partner minigrants. Reflecting back on the importance of this process, one staff member commented that “the strategic planning process marked the first time board members sat down with consumers and understood that their voice is just as important—an equality emerged and was noticeable.”

Despite these positive examples of the provision of opportunities for meaningful role occupancy, considerable room for improvement also was observed. For instance, several sites had failed to get program participants on their steering committees or board of directors, often despite considerable efforts to do so. At other sites, power imbalances resulted in community-based organization (CBO) representatives and other providers driving the decision-making process, even when consumers were technically in positions to have more input. Addressing such problems is critical, because as Gruber and Trickett33 have suggested, organizational structures that appear empowering yet fail to provide members with real decision-making power may, in fact, undermine the prospects for true empowerment.

As indicated in Table 2, consortia members at most sites appeared to have input in policy decisions affecting things such as the type and level of services. Yet, with the exceptions of Pittsburgh and to a lesser extent New Orleans (see above), they generally did not have input in budget and personnel decisions. As Plough and Olafson17 noted in their early case study of Boston’s Healthy Start experience, “sharing power was the major challenge” (p. 229), and both Howell et al.’s15 evaluation and our study findings attest to the continuing difficulties faced in this arena. As suggested above, however, our findings also indicate that on balance, most sites were highly committed to, and making real progress in, finding creative ways for increasing participant involvement in a diverse array of meaningful roles within the program.

Support system fostering social identity and peer support. Evidence of the development of a support system fostering social identity and peer support appeared to differing degrees and in different forms in each Healthy Start site examined. New York City staff and program participants thus remarked on the role that consortium members and program consumers played in recruiting new members both as clients and as participants in the consortia and related program activities. Whether through writing an article about Healthy Start for a neighborhood newspaper, serving as peer educators on domestic violence, or simply spreading the word by recruiting friends and neighbors, program participants and consortia members at this site were credited by staff with having brought in many new program attendees. In Cleveland, the fact that the graduates of one of Healthy Start’s early community outreach training programs went on to form their own group, the Cleveland Neighborhood Forum, which came together bimonthly and also met with other neighborhood groups within and outside the city’s borders, provided another example of the social identity and peer support fostered through the program.

Finally, and in keeping with Fawcett et al.’s emphasis on removing social barriers as a critical strategy for empowerment, several consortia made conscious efforts to broaden or
deepen sense of community across lines of race/ethnicity, class, or professional hierarchy. Philadelphia’s consortium, for example, was concerned that it was not adequately reaching into the Asian American community and consequently formed an Asian Advisory Committee, which later became part of the health department. Similarly, this Healthy Start recognized early on the lack of trust among provider members of the consortium and held a daylong event to attempt to build community within this segment of the consortium. As noted in Table 2, while tensions based on race, class, and professional hierarchy emerged as a theme at many of the sites, so did efforts to address these tensions and in the process to build a more inclusive social identity.

**Collaborative leadership.** The nurturing of collaborative leadership through the consortia also was apparent to different degrees across sites, as highlighted in several of the study themes identified. Opportunities for such leadership thus were discussed in terms of community capacity building, the heavy accent placed on training community members for leadership roles, and stories of success. In the latter regard, a young woman in Chicago described how she had been helped through the program to develop leadership skills and move from being a program participant to the chair of her site’s active Community Mobilization Committee.

Pittsburgh had a clearly demonstrated commitment to shared power between the grantee and the consortium, with some community members active since the program’s inception and displaying a real sense of ownership. One focus group member thus described how she carved out a role for herself in the early planning process, stating that “I just came to the table and started demanding what I wanted for my community . . . and I’ve been here ever since.” New Orleans recently had added two consortium members to the board of its nonprofit, the Great Expectations Foundation. In the focus group, both of those young women were able to answer tough questions raised by the group on why certain administrative decisions had been made by Healthy Start, and both demonstrated their clear identification with, and involvement in, the program’s policy-making processes.

In Cleveland, collaborative leadership was emphasized through both the regional and the overarching Consortia Leadership Committee, which included program participants, business and community leaders, clergy, and program staff who meet regularly to discuss program planning and implementation. In the words of the consortium chair, “The key to developing community leadership is honoring the community’s voice. That doesn’t mean just giving people honorary status at the table but real decision-making power.”

Elsewhere, we examine in detail the facilitators of, and barriers to, the effective functioning of Healthy Start consortia. As suggested above, however, and despite substantial variation by site, each of the Healthy Start programs examined had evolved consortia that appeared to meet several of the basic criteria for empowering organizations.

**Healthy Start Consortia as Empowered Organizations**

As noted earlier, empowered organizations have been defined as those that successfully develop and compete for resources, influence policy decisions, and/or offer effective alternatives for service provision.20 The diverse Healthy Start consortia examined in this study were at very different places in terms of the extent to which they could be considered truly empowered organizations. Yet, with the exception of Kansas City, whose consortium was still in the early stages of its evolution, each of the consortia had met to
different extents the criteria of empowered organizations, and all appeared committed to further movement in this direction.

Successful growth and development. Each of the eight original Healthy Start sites examined had developed consortia that evolved considerably in their organizational development and perceived effectiveness. In Pittsburgh, consortium meeting dates were scheduled 1 year in advance, and twice-yearly trainings, the production of dictionaries on prenatal care and managed care, and other means were used to facilitate active growth and engagement of consortia members.

Healthy Start in New York City was initially brought to Harlem through a group of volunteers who convinced the Urban League to begin a prenatal network. The Harlem site originally provided an informal mentoring role to the two other program sites (Brooklyn and the Bronx), and today, although the three sites continue to operate fairly autonomously, they have begun coordinating more closely through a regional consortium.

The Philadelphia consortium’s development path was probably the most unusual examined, with the consortium having become so “empowered” a few years ago that its leadership made serious efforts to separate from the grantee agency and negotiate directly with the federal government to establish an independent agency. With technical assistance provided by an outside team of community builders, the program was helped to transition through this difficult phase to a new and well-functioning structure in which the Healthy Start program allocates funds to an activist community organization that operates the consortium.

The development of new nonprofits occurred at three sites (New Orleans, Pittsburgh, and Pee Dee). As discussed elsewhere, however, such growth often faced serious obstacles. In Pee Dee, for example, the decision to form a separate 501c3 resulted in a strong African American–led organization but also resulted in the loss of some support from the mainstream white community as white members of the board dropped their membership in the transition. Yet, despite such obstacles, the very development of new Healthy Start nonprofits constituted important and tangible evidence of the development of empowered organizations.

Effective competition for resources. This was demonstrated at a number of the sites examined in this study, with many consortia generating goods and services, as well as financial contributions, from local businesses and agencies in support of their events and activities. New Orleans’s new Healthy Start nonprofit proved adept at generating new funding streams, while the Pittsburgh and New York City programs consistently sought alternative funding to continue their male involvement projects after early funding cuts by HRSA. Consortia members at these sites insisted that men were too important to the lives of the children to have this component dropped and turned their attention to finding other funding sources.

Where the consortia had considerable overlap with economic development leaders in their communities, new funding streams were developed with particular attention to improving infant and family health. But the consortia also showed creativity in attaining needed resources in other ways. When New York City Healthy Start learned that its budget would be decreased as a result of national program expansion, it set about including in its upcoming leadership training an emphasis on how to write small grant proposals and in other ways work toward sustainability. Similarly, when Boston Healthy Start was faced with budget cuts, it provided a consultant to help 20 of its subcontractors arrange for alter-
native funding to ensure their viability. In both of these instances, the consortia actively assisted in decision making aimed at building and strengthening capacity at the local level.

Offering effective alternatives for service provision. Each of the Healthy Start consortia examined played an important role in relation to Fawcett et al.’s strategies of removing social and environmental barriers and enhancing environmental supports and resources. When Cleveland outreach workers noted the displacement of pregnant women from housing due to gentrification in the central city, they came to the consortium to devise focused new housing partnerships that could find families emergency and long-term affordable housing. When Pittsburgh’s consortium identified as a top priority involving fathers more actively in their children’s lives, it helped create an extensive male outreach and support program. In rural Pee Dee, consortium members saw the lack of regular public transportation as the most important barrier to families receiving regular medical attention. Together with program staff, they devised a supportive system of transportation, including the use of Healthy Start vans both to increase health care access and to enable community members to attend consortium meetings and other activities.

Partnering with a local hospital and a clinic, Pittsburgh’s consortium also helped develop two residential programs for clients, while Kansas City Healthy Start and its consortium were instrumental in helping their city expand its teen pregnancy prevention program, KC WAIT, and engage multiple community partners in this effort. Indeed, at every Healthy Start site examined, we identified several examples of ways in which the consortia had contributed to the creation of new or modified programs or practices.

Partnership or networking with other organizations. As indicated in Table 2, a theme identified by two of the three reviewers involved the extent to which the consortia had been able to create and sustain partnerships with both public- and private-sector organizations and entities. Although those Healthy Start programs that had close links with local or state health departments appeared to be particularly well positioned for such networking, virtually all of the project sites examined demonstrated such linkages. At many sites, as suggested above, local businesses contributed food and goods for health fairs, cosponsored special events, provided technical assistance, and assisted in fund-raising. In Cleveland, target area churches sponsored “Healthy Baby Sundays,” in which part of a service was focused on increasing awareness about infant mortality. Both Cleveland and Chicago partnered with local jails, developing special programs for the growing number of pregnant and parenting women who were incarcerated.

Some Healthy Start consortia created strong alliances with key political leaders and the local media. The mayors of both Cleveland and New Orleans often played an active role in consortium meetings, and their very presence enhanced attendance and perceived organizational credibility. Philadelphia’s program ran a lending closet for expectant and parenting women, in partnership with the office of the mayor. Kansas City’s consortium appeared particularly adept at drawing on its political and media connections in educating policy makers and the general public about Healthy Start and in pushing for new funding streams and policy changes that would enhance service delivery.

At several sites, networking sometimes resulted in the creation of new citywide coalitions or other interorganizational linkages. New York City Healthy Start thus took the lead in forming a consortium of 20 to 30 male involvement programs that it convened on a monthly basis. This Healthy Start also partnered with the Children’s Defense Fund and the local health department to undertake aggressive outreach on immunizations.
A critical result of consortia networking involved the fact that for the first time in many communities, non-health-related organizations were actively involved in the fight against infant mortality. Commenting on this increased involvement of local CBOs, one of Boston’s consortium leaders commented that “more and more people are realizing that institutions aren’t healthy if the community isn’t healthy.”

Influencing policy decisions. A major theme that emerged in our study involved the diversity across consortia, reflected in part in the very different extents to which they appeared to be involved in influencing policy within and beyond their Healthy Start programs (see Table 3). At many sites, the consortium, through its executive or steering committee, made policy decisions on the type and level of services to be provided but not on budget or personnel. In a few sites, major decisions concerning program direction were attributed by staff to advice from community members of the consortia. Boston staff members thus reported their site’s development of a strong case management model heavily reflected community input, as captured in one woman’s comment that

you don’t need to give any more money to clinical services. You need to look at what’s preventing people from getting to those services. We need baby-sitting, we need transportation. We need somebody who can take us through this whole process. . . . Don’t just be interested in me while I’m pregnant.

Similarly, it was the community that decided that Boston’s neighborhood health centers were the best venues through which to provide needed services.

As indicated in Table 2, however, a theme identified by two reviewers involved the often quite limited role of the consortia in influencing policy. In some cases, this appeared to reflect a lack of experience in speaking the language of policy. For example, some key informants and focus group members responded in the negative when asked whether their consortia had influenced policy yet later gave examples that were clearly indicative of a policy-influencing role. In many cases, however, the influence of the consortia appeared to be quite limited where policy was concerned—a finding that Howell et al.15 also reported.

At the same time, several impressive examples were provided of leadership by the consortia in efforts to influence policy at the macro level. Chicago’s consortia, for instance, played a key role in both obtaining a statewide exemption for parents of special-needs children from work requirements under welfare reform and successfully mobilizing to stop a proposal to mandate Medicaid managed care on a statewide basis. In the latter case, the consortia were credited by some members as having given them the ability to critically analyze the effects of the proposed legislation on their community and to advocate against the proposed plan. In rural Pee Dee, consortia members and outreach workers enhanced environmental supports and removed an important social barrier by fighting successfully for increased access to health insurance among the area’s growing number of part-time workers. As suggested above, however, such examples proved the exception rather than the rule in this study, and there was room for improvement in this area.

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

As Green and Kreuter34 and others1,3-6,35-39 have noted, the past two decades have seen a paradigm shift in thinking about prevention through which the community has become
the new “center of gravity” in both scholarship and practice. The federal Healthy Start Program both reflected this trend and played a leadership role in demonstrating the role that well-funded community-based consortia could play as mechanisms for facilitating community involvement. Although it is still too early to attempt to link this program component with long-term changes in infant mortality and related health outcomes, it is possible to examine the intermediate outcomes of Healthy Start’s commitment to empowerment on the individual through the organizational and community levels. This article has attempted to contribute to this process by examining the ways in which the creation and nurturing of community-based consortia contributed to organizational-level empowerment at nine Healthy Start sites.

The development of consortia appeared to strengthen grassroots participation and focus institutional and organizational attention on the needs and concerns identified by local communities. By helping members identify and dialogue about the interrelationships between infant mortality and issues such as unemployment, domestic violence, and housing, the consortia helped to facilitate the development of critical awareness, which in turn served as a “catalyst for change” (p. 7) as consortia sought to address some of these interrelated issues. Similarly, and although program staff and participants spoke of continuing tensions experienced around race, ethnicity, and class, the consortia at many sites helped address these tensions, through vehicles such as workshops on cultural competence and special outreach efforts. However, the needs for further work in this area and for providing a greater range of opportunities for resident participation in decision making and governance were apparent.

As Healthy Start transitions into its new role as a permanent program with a continued mandate for substantive community involvement, special attention should be devoted to providing greater guidance and support on this aspect of the program’s functioning. Based on our examination of the Healthy Start experience, some general implications for practice may be drawn with respect to the effective development, functioning, and sustaining of consortia as part of community-based health initiatives:

1. Roles for the consortia should be clearly laid out and should include identification of community concerns; strategic planning that addresses identified concerns; identification and recruitment of community institutions to partner in implementation; and ongoing outreach, monitoring, program development, and evaluation.

2. Support for the consortia should be substantial and should include high-level administrative personnel to support the operation of consortia; clear guidance and access to technical assistance (including peer mentoring) in the development, governance structure, functioning, and sustaining of consortia; and ongoing training for consortia members and leaders in governance, outreach, program evaluation, leadership, and advocacy skills.

3. The consortia should be helped to focus their membership on transforming programs, policies, and practices, rather than simply focusing on individual behavior change. One promising set of strategies that could be tried in this regard might include geographic mapping of factors in the community that affect health, analysis of mapping by diverse community stakeholders, identification of community institutions that can address priority factors, and developing community accountability for specific and realistic annual targets for reduction of negative factors.

4. Particularly in light of the growing national commitment to eliminating health disparities, consortia should be helped to analyze and develop plans to address racial
disparity in health outcomes. Plans and implementation should address cultural competency of health care providers, ability to reach target population with services, specific analysis of health indicators by race and ethnic community, and interventions that address specific racial and ethnic disparities.

Consortia and other community involvement mechanisms are time-consuming and labor intensive, and they may sometimes slow progress toward the achievement of program goals. Yet, as this study has suggested, a heavy accent on community involvement may ultimately strengthen programs like Healthy Start by enabling a focus of community concerns and issues, fostering local leadership, building strong community partnerships, and increasing a sense of local ownership.

Further research is necessary to determine how and to what extent empowerment at the individual, community, and organizational levels may be able to influence health outcomes. Yet, while this research is being undertaken, the many lessons learned through the Healthy Start experience with community involvement should be used to inform our practice. Together with prior research, this study has demonstrated that community involvement can make a real difference in helping to build organizational and community infrastructure. Through this process, it can transform programs, practices, and policies in ways that may lay important groundwork for the ultimate goals of changing health behaviors and health outcomes. Indeed, as former NHSP Director Henry Spring has pointed out, Healthy Start is a classic example of a health program that recognizes and “speaks to the pyramid” of community involvement and community capacity building as necessary building blocks for the achievement of distal health outcomes. This study suggests that by contributing to the intermediate level of the pyramid through organizational empowerment, the increasing emphasis on community involvement in comprehensive health initiatives like Healthy Start is well placed.

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42. Personal communication from Dr. Henry Spring, former director, National Healthy Start Program, Health Resources and Services Administration, March 21, 2000.
Health behavior specialists and health educators, like other professionals and the public at large, face a continuing and growing challenge—the aging of our society. The pace of aging in the 21st century will be like that of no other period in human history. The number of older adults is rapidly increasing around the world and will continue to increase in this century. Older adults will also become increasingly diverse during the next three decades. Most Americans born today can expect to live to the age of 75 or older. Persons 65 years of age and older constitute the fastest growing segment of the U.S. population. As a result, the number of adults who are chronically ill or at risk of chronic illness is increasing. Older adults are also the most frequent users of the health care system. However, in contrast to a traditional picture of gradual fading and slowing once associated with aging, older adults in the United States are among the most frequent pleasure travelers and the fastest growing segment of Internet users. Because behavioral and social factors are the primary determinants of maintaining health and function, the aging of our society presents an important opportunity for closer collaboration between professionals in health behavior and aging.

The fields of public health and aging have been converging for several decades, as illustrated by the establishment of the Gerontological Health Section in the American Public Health Association in 1978 and the staging of a national conference on public health and aging in 1994. During this same time period, considerable progress has been made in the fields of health behavior research and practice. Although the Society of Public Health Education has yet to identify aging as one of its special interest groups (www.sophe.com), there has nonetheless been noteworthy research on older adults and health behavior and education during the past decade. According to the results of a literature search performed using PsychLit, nearly 5% of all articles published between 1990 and 2000 in Health Behavior & Education (formerly Health Education Quarterly) focused on older adults or aging issues.

The book Behavior, Health, and Aging provides an opportunity to examine some of the exciting developments in theory and research that have resulted from the converging perspectives of aging and health behavior. Editors Stephen B. Manuck, Richard Jennings, Bruce S. Rabin, and Andrew Baum of the University of Pittsburgh bring together an array of scholars in aging-related fields to provide "a selective survey of some of the most important developments in research and theory about behavioral aspects of health and illness in aging." It is a pleasure to read the preface written by the editors, which succinctly outlines the contents of each chapter. The book examines the basic tenets of the genetics and molecular biology of aging, especially in relation to the immune system, quality-of-life concerns, gender-related issues, and psychosocial aspects of aging on chronic disease, particularly cardiovascular disease.

Of particular interest to health behavior specialists are the chapters that address quality of life, women's health, and psychological adjustment to chronic disease. Quality of life has emerged in the fields of health behavior and public health as a desired outcome for research and practice. The work reported by Robert M. Kaplan and Jennifer Erickson in chapter 2 demonstrates the value of using quality-adjusted survival analysis to describe health status in men and women during the life course. When Kaplan and Erickson applied quality-adjusted survival analysis to a large population-based sample of U.S. residents, they found that women live longer than men do; however, during the years that they survive, women experience a lower quality of life than men. The authors conclude that quantifying health outcomes is a methodologic challenge.

In addition to the gender questions raised in chapter 2, two subsequent chapters deal specifically with women's health issues. Elaine Leventhal provides an excellent review and summary in chapter 2 of the literature describing the gender differences in longevity. She explores the biological,
psychological, and social distinctions between men and women and their implications for intervention. She believes that women live longer because they learn illness and wellness behaviors, such as making use of the health care system, that enforce increased alertness to their symptoms and openness about seeking care. Karen Matthews and colleagues (chapter 4) present a comprehensive summary of the biological bases and physical changes of menopause and examine women’s expectations and adaptations during this important transitional period. They provide important evidence that menopausal transition may be an optimal time to introduce lifestyle changes.

The importance of perceived control has long been recognized in health behavior research. In chapter 9, Richard Schulz and colleagues describe a control-process framework that can be applied to understanding adjustment to various disabilities and discuss its relevance to older adults. Vicki Helgeson and Kristin Mickelson (chapter 11) say that older adults report similar, if not higher, levels of subjective well-being as compared with younger persons. They examine the multiple strategies that older adults can use to restore self-esteem and facilitate adjustment to chronic illness. These strategies include social comparison processes, denial, and attempts to derive meaning from the experience. They examine the current evidence on how these strategies reduce the threat of chronic illness. Other chapters deal with the effects of aging on immunity and cardiovascular disease.

The book gathers a multidisciplinary team of authors to address discrete and interrelated issues on health behavior and aging. The contributions are of excellent quality and provide an enlightening presentation on a number of important issues relevant to aging. The reader should be aware that the chapters were clearly written independently. Authors present material from their own disciplinary perspectives: Some present applied research, others present theoretical material; some review the literature, others focus on their own work; and only a few authors address future issues. There is no consistency in format, and the editors have made no attempt to integrate concepts across chapters or within specific subsections (e.g., each chapter that addresses immunology presents its own basic background section).

It is important to note that this book is not designed as an introductory gerontology text; a recent review of undergraduate- and graduate-level texts is available elsewhere. As a selective survey, Behavior, Health, and Aging will be a useful resource for health behavior specialists who work or anticipate working in aging issues, particularly quality of life, women’s health, and psychosocial adjustment.

Lynda A. Anderson, PhD
Health Scientist, Prevention Research Centers
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention
and the Department of Behavioral Sciences and Health Education
Rollins School of Public Health
Emory University

Suzanne M. Smith, MD, MPH, MPA
Chief, Health Care and Aging Studies Branch
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention

References

During the past decade, vast amounts of capital—both social and financial—have been committed to coalition work in communities. Coalitions spread quickly through the community health promotion landscape in part because they provide the potential for us to reach many of our ideals: engaging diverse segments of the community, pooling varied resources and perspectives, conducting multiple interventions at multiple levels using a social ecological framework, conducting advocacy activities, strengthening community capacity, and facilitating community empowerment. Of course, funders also advocated, and often required, community coalitions, and this also stimulated the development of many coalitions.

Recently, however, some leaders in health education have begun to question the heavy investment of our energies into building and maintaining coalitions. Indeed, recent reviews show few coalition-led efforts that have led to improved public health outcomes. Roussos and Fawcett categorized 34 studies, representing more than 250 collaborative partnerships, into those that provided evidence for more distant population-level outcomes, community-wide behavior change, and environmental change. Strongest evidence existed for the contribution of partnerships to environmental change, very broadly defined to include changes in programs, services, and practices. Roussos and Fawcett also concluded that partnerships have made only a modest contribution to community-wide behavior change and that research is insufficient to make strong conclusions about the impact of partnerships on population-level outcomes (largely due to evaluation design challenges). Similarly, Kreuter and colleagues found only a handful of examples of documented health status or systems change in a review of published descriptions of coalitions and consortia with evaluation protocols in place.

The book by Berkowitz and Wolff, The Spirit of the Coalition, does not address the current debate on coalition effectiveness but rather begins with the premise that “coalitions are very effective structures for getting things done.” The book is written as a practical guide to starting and operating community coalitions. The authors hope to provide the “spark” to get the reader involved in coalitions and to deepen the understanding of coalitions for those already working with them. The book succeeds at both of these goals.

The authors purposely avoided writing a manual or textbook on coalitions. As a result, the book provides few worksheets or exercises and includes few references to the scientific or wisdom literature on coalitions. Instead, the book is structured around in-depth interviews with 16 leaders of community coalitions. These stories form the core of the text, and additional explanations and insights from the authors provide the glue that binds the stories into a coherent whole. Each chapter also includes “Lessons From the Field” that summarize the main points from the chapter, as well as sample documents from real coalitions, such as recruitment letters and coalition publicity materials.

The initial chapters follow a logical order based loosely on the initial stages of coalition development and associated tasks: how coalitions get started, coalition membership, coalition structure, coalition meetings, and coalition leadership. Then, rather than a series of chapters on the actual work of coalitions, such as assessment, planning, implementation, and evaluation, the remaining chapters focus on maintaining the coalition and related issues. These chapters include Promoting the Coalition, Funding the Coalition, Coalition Advocacy, Maintaining the Coalition, and Pitfalls and Challenges.

Several of the chapters offer insights and advice not seen in other books on coalitions. The chapter on advocacy, for example, is particularly thoughtful. In this chapter, the authors provide a balanced view of the positives and the negatives of engaging in advocacy work. The coalition leaders cited in this chapter express uniform enthusiasm for advocacy. The authors complement this perspective with a frank discussion of some of the risks associated with advocacy: loss of community support and loss of support from funding sources. The chapter then provides practical advice on advocacy techniques and principles. Topics include starting with local action, building internal support, finding the energy, and dealing with being attacked.
The chapter on leadership is also particularly engaging and organized very practically. Berkowitz and Wolff describe three aspects of leadership: leadership at meetings, leadership between meetings, and personal qualities of the leaders. Leadership at meetings includes creating and following an agenda, keeping track of meeting times, giving everyone a chance to speak, and delegating tasks. Leadership between meetings includes following up on decisions and tasks, as well as ongoing communication with members. Effective leadership style varies with particular situations—sometimes requiring a facilitating and consensus-building approach and sometimes requiring strong direction. According to Berkowitz and Wolff, leaders should ideally drive the process and agenda but let the coalition make decisions. Interestingly, the authors do not clearly separate a staffing function from coalition leadership.

Other chapters with a fresh and practical approach include the chapter on structure, which can often be a rather dry topic, and the chapter on funding. The book concludes with predictions for coalition work in the future: Coalitions will begin to form larger organizations of their own, a greater percentage of coalition work will take place electronically, coalition members will come from more diverse ethnic and cultural backgrounds, and coalitions will be influenced by social policy. The authors express enthusiasm for the future of coalitions, arguing that they provide one of the few forums for diverse people, who may not normally interact with one another, to build relationships, thereby strengthening communities.

This book’s main contribution is to energize and motivate those doing coalition work and to provide sound and practical advice on many of the basic tasks associated with forming and maintaining community coalitions. It could be read in its entirety to give a full picture of the issues involved in leading and/or staffing a coalition, or specific chapters could be used when different stages are reached or various frustrations or difficulties arise. It is fairly dense with text and quotes, so even though it has the outward appearance of a manual, it is best absorbed by taking the time to read it (as opposed to flipping through it for useful tips or worksheets).

Finally, the book emphasizes faith and spirit throughout. The authors explain that the book is titled The Spirit of the Coalition to capture the need for conviction, engagement, wholeheartedness, and passion—the inner strengths—to engage in successful community-building work. The authors focus on community building and collaboration rather than on concrete steps coalitions should take to solve community problems. This is consistent with a community development and capacity-building approach to community health promotion, and many of us in the field have faith that this is the right path for public health education. Indeed, evidence is building to demonstrate that strengthening community does have an impact on public health.1,3

On the other hand, it may be a long, meandering path between effective community building and increased immunization rates and decreased smoking prevalence. Furthermore, we are under increasing pressure to implement evidence-based intervention strategies and demonstrate that health outcomes result from our efforts. As health educators, we may have to become better at balancing community-building work as described in this book, with gentle guidance that points community coalitions toward activities that have a reasonable chance of leading to improved health outcomes.

Michelle C. Kegler, DrPH, MPH
Department of Behavioral Sciences and Health Education
Rollins School of Public Health, Emory University

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