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Health in My Community: Conducting and Evaluating PhotoVoice as a Tool to Promote Environmental Health and Leadership Among Latino/a Youth

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Abstract

Background: The PhotoVoice method has shown substantial promise for work with youth in metropolitan areas, yet its potential for use with Latino youth from agricultural areas has not been well documented.

Objectives: This project was designed to teach environmental health to 15 high school youth while building their individual and community capacity for studying and addressing shared environmental concerns. The project also aimed to test the utility of PhotoVoice with Latino agricultural youth.

Methods: Fifteen members of the Youth Community Council (YCC), part of a 15-year project with farmworker families in Salinas, CA, took part in a 12-week PhotoVoice project. Their pictures captured the assets and strengths of their community related to environmental health, and were then analyzed by participants. A multi-pronged evaluation was conducted.

Results: YCC members identified concerns such as poor access to affordable, healthy foods and lack of safe physical spaces in which to play, as well as assets, including caring adults and organizations, and open spaces in surrounding areas. Participants presented their findings on radio, television, at local community events, and to key policy makers. The youth also developed two action plans, a successful 5K run/walk and a school recycling project, still in progress. Evaluation results included significant changes in such areas as perceived ability to make presentations, leadership, and self-confidence, as well as challenges including transportation, group dynamics, and gaining access to people in power.

Conclusion: The PhotoVoice method shows promise for environmental health education and youth development in farmworker communities.

Keywords

Community-based participatory research, environmental health, community health research, public health

PhotoVoice is a visual methodology that puts cameras in the hands of community members to record their perspectives and create potential opportunities for social change. Since its inception in the mid 1990's for documenting the lives of rural village women in China's Yunnan province,[1,2] this form of community-based participatory research (CBPR) has achieved widespread popularity with a broad range of communities.[3] Caroline Wang and Mary Ann Burris (1997), describe PhotoVoice as having three main objectives:

> (1) to enable people to record and reflect their community's strengths and concerns, (2) to promote critical dialogue and knowledge about important issues through large and small group discussion of photographs, and (3) to reach policymakers. (p. 369)

Like other forms of CBPR, PhotoVoice offers opportunities to engage individuals that typically would not have the experience, skill-set, or confidence to conduct research. PhotoVoice can play a role in youth development and leadership by showing youth how they can contribute to making a

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difference in their community through active engagement in meaningful decision-making. By capturing the attention of both participants and typically a much larger audience, and by striving to translate findings into action, PhotoVoice reinforces the benefits for those involved in the research process and validates the time and energy they have invested. Further, PhotoVoice can create conditions in which participants can become empowered, as they develop new skills and see the changes they can produce through collective action. Use of PhotoVoice can be particularly important to marginalized communities.[3–5]

The PhotoVoice method has been used to study and address a plethora of health issues as well as broader concerns with health and social equity.[3] It has focused on the concerns and strengths of highly marginalized populations, e.g., the homeless,[4,6] and has been demonstrated to be effective for work with groups of particular interest in the present study: youth,[4,5,7–10] Latinos,[11,12] and adolescent Latinos.[7,13–15] Finally, PhotoVoice has proven promising in connecting community groups with local health jurisdictions by providing data and building partnerships.[16]

Although several applications of PhotoVoice with youth have taken place both in the U.S. and globally,[4,5,7–10] these have tended to be situated in inner city and other metropolitan settings. To our knowledge, only one PhotoVoice project has been conducted with youth from an agricultural area in the United States. That North Carolina project, however, focused on immigration issues.[15] Below we describe the use of PhotoVoice in the city of Salinas, located in the agricultural Salinas Valley area of California, as part of a broader environmental education, leadership and participatory research effort with farmworker family youth.

Low-Income and Latino Communities' Disproportionate Exposure to Environmental Contaminants and Lack of Access to "Resources for Living"

Latinos and low-income communities bear a disproportionate burden of exposure to environmental contaminants that can lead to health disparities.[17,18] At the same time, they often lack such "resources for living" as easy access to healthy, affordable foods and clean and safe places in which to live, work and play.[19] Obesity and diabetes are among the health problems caused or exacerbated by these inequities.[20] Residents of the Salinas Valley may also be exposed to pesticides due to their proximity to agricultural fields.[21] The Salinas Valley is home to a $4.14 billion agriculture industry, and grows a large portion of the lettuce, artichoke, strawberries and other fruits and vegetables consumed in the United States.[22] Home to many of the farmworkers who contribute to agricultural production in the region, the city of Salinas is the main urban area in the Valley. A low-income, predominantly Mexican-American community, 75% of Salinas' 154,484 residents identify as Hispanic or Latino/a, with the majority of Mexican descent.[23] Driving through Salinas, one can quickly perceive the influence of the predominately Mexican culture, including Mexican food stores and conversations frequently switching back and forth between Spanish and English. An estimated 13.5% of Monterey and San Benito counties' residents are undocumented, and therefore generally unable to access health insurance, income supports, food stamps (Cal Fresh) and many other federal and state assistance programs typically available to low income citizens.[24] In addition, 18% of city residents live below the federal poverty line.[23]

In such a climate, education and empowerment programs can be difficult to access for many youth from poor and working class families. In addition to providing one such opportunity for empowerment, leadership training and additional education, PhotoVoice has the potential to showcase youth talents that have not often been recognized, build relationships, and further develop future orientation[3,4,9] .

THE CHAMACOS STUDY AND THE YOUTH COMMUNITY COUNCIL

The PhotoVoice project described here was part of an environmental health youth empowerment program in Salinas, the Youth Community Council (YCC) of the CHAMACOS (Center for Health Assessment for Mother And Children of Salinas) study. Begun in 1998, the CHAMACOS Study follows a group of mothers and their children in the Salinas Valley to examine the impact of environmental exposures on the health and development of the children[25] (see www.chamacos.org for a summary of the larger project). The study has maintained a strong community engagement program since its inception, with bi-directional learning between researchers and community members constituting one of its foundational guidelines.[26] The larger CHAMACOS study is guided by a Community Advisory Board (CAB), which includes one youth

representative. The CAB meetings focus primarily on future research projects of CHAMACOS and on communication of CHAMACOS research findings to the farmworker, grower and other community constituents. The CAB is kept informed of YCC activities.

In October 2010, the Youth Community Council (YCC) was founded to build leadership among community youth by providing education on environmental health issues and the tools to create a healthier community. The YCC has since included a total of 25 youth aged 14 to 18. Participants learn about environmental health, and engage in conducting their own participatory research, with the goal of becoming part of the next generation of environmental health leaders. Use of the PhotoVoice method was seminal to these efforts. As noted above, the PhotoVoice method has been used successfully in a number of youth projects, and improvements in leadership skills, critical analysis, and feelings of empowerment and civic engagement have been reported.[3,4,9] Although not exclusively focused on Latinos, several of these projects have included a high proportion of Latino youth[7,13–15] and the method's utility with this population has appeared promising.

METHODS

Recruitment

Recruitment of the initial cohort of YCC members was facilitated by the Migrant Education Program (MEP). As an organization already working with Latino youth, the MEP provided an important vehicle for community outreach by announcing the YCC program to children of farmworkers enrolled in MEP. Parents of the 11 students who expressed interest in participating in the YCC were contacted by YCC staff and signed consent forms, enabling their children to participate. The initial YCC cohort, comprised entirely of students from Alisal High School in Salinas, met from October 2010 through May 2011. This cohort focused on activities that would help them learn about environmental health. To increase the size of the group, current members and other youth-serving organizations were asked to identify new members from two other local high schools. The 25 youth who chose to participate in the YCC were all Latino of Mexican descent, aged 14–18. Sixteen of these youth (9 girls and 7 boys) participated in the PhotoVoice project. One of the authors, a UC Berkeley undergraduate student (GC) as well as a recent graduate from Everett Alvarez high school in Salinas, assisted with the PhotoVoice project as a summer intern. Both the recruitment methods and the PhotoVoice project were approved by the institutional review board at the University of California at Berkeley (protocol number # 2011-07-3412).

PhotoVoice Process/Curriculum Design

The CHAMACOS YCC PhotoVoice process was developed in 2011. We adapted key elements from the curriculum of two relevant youth programs: The Youth Empowerment Program (YES!) a large, CDC-funded program with PhotoVoice as a core element in its work with preadolescents in six schools in the Richmond, CA school district;[9] and the Youth Justice Board Project, a civic engagement—focused youth empowerment program in New York City.[27] As outlined in Table 1, the sessions developed with the YCC covered a broad range of topics aimed at enabling students to better understand environmental health, broadly defined, and to take part in participatory research, including PhotoVoice, research ethics, survey research, and environmental exposure assessment.

To supplement the activities and lessons, different community members including a local artist, a photographer and a member of the Board of Education provided training sessions for the youth. Sessions on environmental health included

Table 1. CHAMACOS PhotoVoice Session Outline

Overview of PhotoVoice Project and Introduction to Environmental Health
Photo Ethics and Photo Safety
Photography 101: Storytelling With Photography
Photography Composition
Photosharing I: Sharing Photos and Identifying Priority Issues
Photosharing II: Sharing Photos and Identifying Priority Issues
Photosharing III: Sharing Photos and Identifying Priority Issues
Photo Manipulation: Photoshop Workshop
Commentary I: Drafting Summaries
Commentary II: Reviewing and Finalizing Commentaries
Preparing to Share Stories With Community
Planning Action Projects

how chemicals in the air, food and water can impact health; specific exposures of concern, such as pesticides; and discussions about current environmental health stories in the local media. Youth also assisted in the planning and execution of sessions to their peers.

CHAMACOS YCC members attended 12 PhotoVoice sessions held each Saturday morning for two hours at a public library in Salinas. Each YCC member received an incentive of a $20 gift card at each session he or she attended, and snacks were served. The size of the gift card was consistent with incentives provided in other local youth projects. During the fourth week, and following a session in which the youth learned about and discussed research methods, research ethics and safety-related concerns, each participant was given an inexpensive digital camera, shown how to use it, and asked to take pictures of environmental health issues in his or her community, highlighting both problems and assets. The directions were intentionally kept to a minimum to allow the youth to select the themes and topics they wished to address through their photographs.

The youth were instructed to send 10 digital photographs to the YCC coordinator before each of three meetings, so that the coordinator could project the photos for the full group to see. Common themes and issues were identified and discussed by the full group following each round of photo shoots. During these sessions, the youth were asked to select one of their own photos that they would like to highlight, and to explore it more deeply using the pneumonic SHOWeD,[28] which stands for: What do you See in this picture? What's really Happening here? How does this relate to Our lives? Why is this happening? and What can we Do about it? The SHOWeD technique, commonly used in PhotoVoice projects,[3] encouraged the youth to think and critically dialogue not only about what their pictures were illustrating, but also about the underlying factors contributing to the problem and eventually, how these problems might be addressed.

For the picture he or she had selected, each student also wrote a short narrative to better describe his or her choice of and understanding of the photograph. The questions guiding their narratives were: Why did you take the photo? Why is that issue important? And, what can you (the CHAMACOS YCC) do about it? The youth interpreted their own photographs and decided as a group where they wanted the photographs displayed.

RESULTS

PhotoVoice Project Participation and Action Outcomes

The PhotoVoice project began with 16 youth and retained 15 over the entire 10 months. Youth members attended 12 meetings, and took 712 total photographs. Key themes that emerged from their pictures and discussions were poor access to affordable, healthy foods; limited access to safe spaces for physical activity; ease of access to tobacco products (see Figure 1); and poor working conditions for farmworkers (see Figure 2).

Positive themes or assets included committed individuals and organizations working for a stronger community and plenty of open spaces in surrounding areas (See YCC photos and summaries at www.cerch.org.com/yccPhotoVoice). Narratives written by youth members included a broad range of recommendations about how to change their environment. Among these were: highlighting novel uses for recycled material; creating bike lanes to make the streets safer for cyclists; cleaning up the local parks to show that people appreciate their local surroundings; bringing plants into office work spaces; improving working conditions for farmworkers; promoting organic home gardens; creating playgrounds to prevent young children from playing in parking lots; and encouraging stores to sell fresh fruits and vegetables to improve access to healthy foods. The two youth authors on this paper also recommended additional environmental changes, including creating more bus routes, adding more street lights, and increasing opportunities for physical activity through free Zumba and low-cost gym memberships.

YCC members shared their photos and narrative summaries with members of the Salinas community at venues and events including a display at the local Cesar Chavez library; at the 2011 opening of Binational Health Week at the local health department (an event to further collaborations between Mexico and the US to promote health); a CHAMACOS community forum attended by over 200 residents; meetings with elected officials; and on local radio and public television. Finally, and in keeping with the PhotoVoice method's commitment to developing action plans as part of the process, participants followed their dissemination activities with the development and execution of two projects to address some of the environmental health issues they had identified. The first



Figure 1.

"What is seen here? Basically just cigarettes on sale. All types and kinds of cigarettes. New stores selling boxes of cigarettes and advertising them. Since it is a new store they want to make money and make customers. This affects our lives because smoking is a habit to break and it contains nicotine that is highly addictive. Cigarettes give you diseases like lung cancer and others to add but this is really bad for a community like Salinas."—Maria Molinero



Figure 2.

"This picture is important because it shows how early a field worker has to get up and be ready to do his or her job. It also shows how bad working conditions are for field workers, as you can see he is the only one out there which in some cases can be dangerous. We can provide better working conditions for these people that have to work hard to do their job."—Lupe Martinez

of these action plans was a 5k Run/Walk that YCC members coordinated and implemented with a local community health organization. Over 800 community members participated in the Run/Walk in June 2012. At the event, health information was provided by a number of local organizations and healthy snacks were sold by the YCC and by other groups. The 5K Run/Walk directly grew out of the youth's concerns about the community's lack of sidewalks for safe walking and biking and other safe places to exercise (see Figure 3).

The second action plan was designed to develop and implement a recycling program at the high school attended by most of the YCC members (Alisal), with hopes that the program might be scaled up to the school district level. This project grew out of youth's concerns for the amount of garbage they saw in their community (see Figure 4) and the lack of a recycling program at their school. They discussed how a recycling program could also benefit their community. For example, one student photographed a park bench made of recycled material.

Initial meetings with members of the school administration at the high school revealed genuine interest in the recycling program, though bureaucratic obstacles and the prioritization of problems of greater concern, such as gang violence, made its full development and implementation a longer-term endeavor.

EVALUATION OF YOUTH PARTICIPANTS

A multi-faceted evaluation was a central part of the project's methodology and included participants' written reflections at the end of each session, participant observation, and a 43-item questionnaire. The weekly reflections asked youth to write a response to one to three questions specific to what the youth had learned that day (see Table 2). These questions were designed to demonstrate the youths' understanding of environmental health and the goals of the PhotoVoice project.

A 43-item questionnaire was completed twice, once upon conclusion of the picture taking and discussion aspects of the PhotoVoice project, and again, approximately 10 months later, following the YCC members' participation in PhotoVoice-related action projects. The survey included both Likert-scale

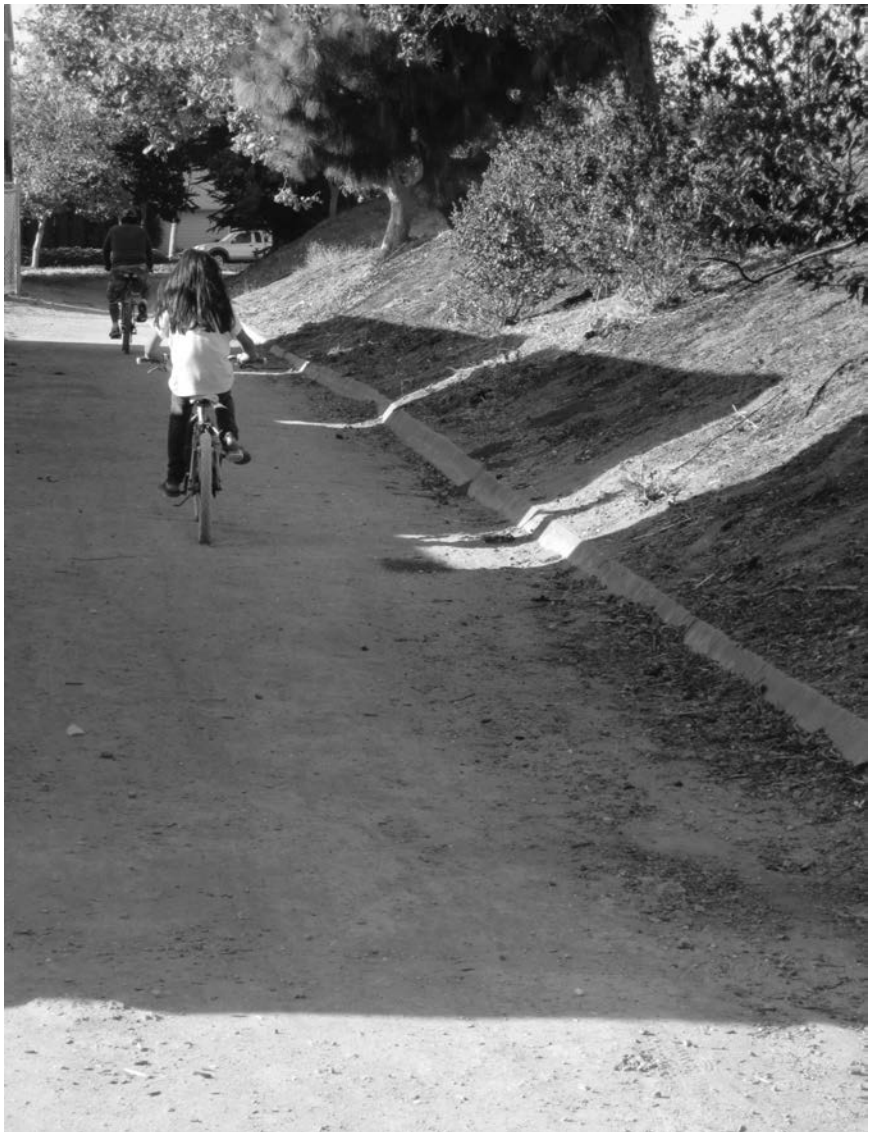


Figure 3.
"This picture shows a little girl and her father riding their bikes and making an effort to exercise while spending family time. The picture shows us that we need more bike lanes throughout the Salinas community and also places where it is accessible to ride bikes and exercise. We could make safe places for people to exercise and ride their bikes."
—Crystal Casillas

type items developed for this project and relevant items from validated scales on self-efficacy, leadership, sociopolitical engagement, motivation, and participatory behavior [29,30] Participants were asked to rate each item on a scale where 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree Nor Disagree, 4 = Agree, and 5 = Strongly Agree. We compared the responses of each YCC member on the initial and follow-up surveys using a one-tailed t-test with p values of < 0.05 considered statistically significant (see Table 2). Finally, observations and reflections on the youths' photos and action projects were included as part of the project evaluation.

Table 2 shows the results of the questionnaire administered after the photo sessions and 10 months later. Significant changes over this period were noted on a few items in three of the five domains (action self-efficacy, sociopolitical skills, and participatory behavior) with no changes reported under motivation and influence or leadership efficacy. Specific items on which significant change was reported included students' perceptions that they could make effective public presentations to peers ($p = 0.03$) and teachers and the principal ($p = 0.01$) on an issue they cared about.

YCC members at Time 2 also were significantly more likely to report that "I am often a leader in groups" ($p = 0.03$) and "If I want to improve a problem in my city, I can work effectively with other students on this issue" ($p = 0.01$). With respect to participatory behavior, participants at Time 2 were significantly more likely to report that "I have spoken with adults in my school about issues that I want to improve in the school" ($p = 0.03$). In contrast, no significant differences were observed over this time period on items such as perceived ability to "make a real difference in improving my school; city;" "develop a research tool that gathers useful information," or being able to work with other students to "do something about it" if an issue comes up that "affects the youth in my city."

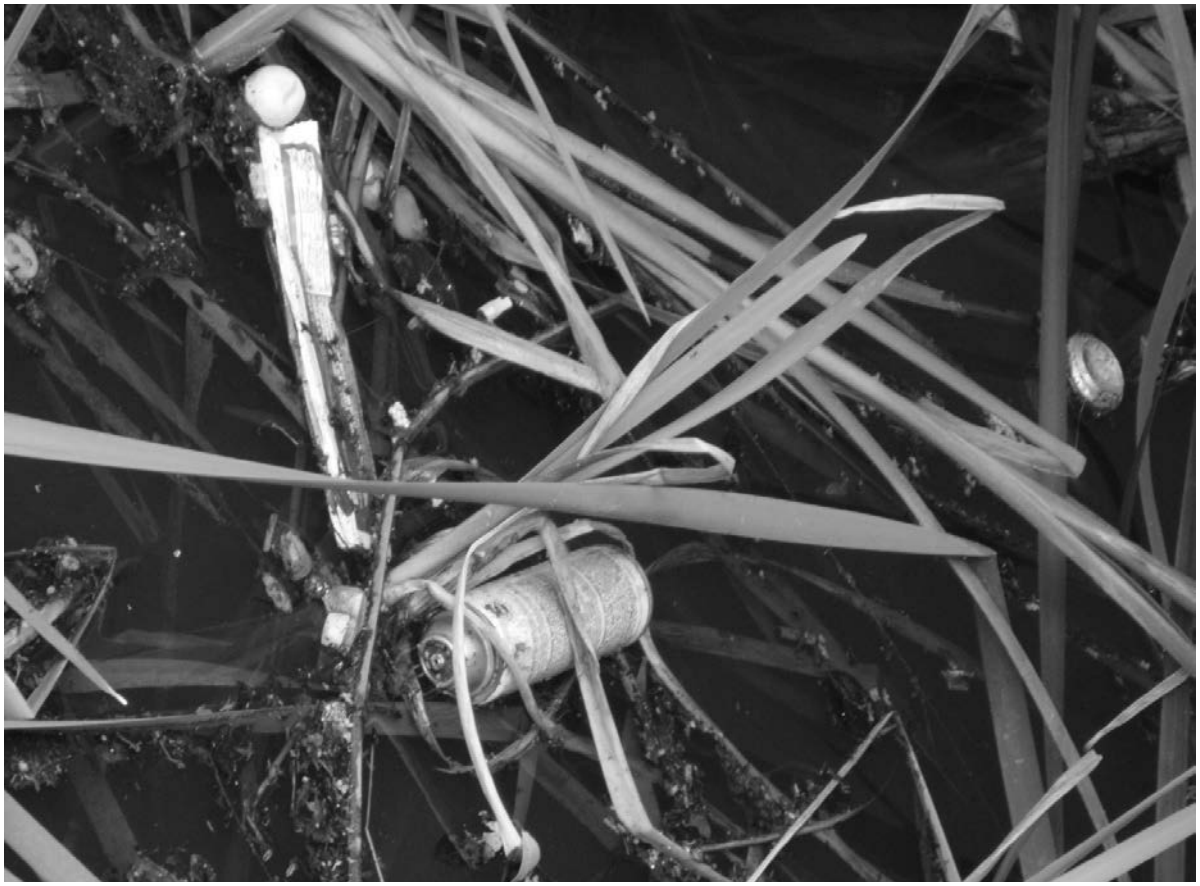


Figure 4.

"This picture is about trash! As you can see there is a can of aerosol in the water. This picture was taken in Natividad Creek Park also known as El Parque de las Casitas. This affects our community because it makes the park look bad . . . To change that we can go and help clean the parks and ask people or high school students to help and as appreciation they can get community hours."—Yuliana Cortez

Responses to Open-Ended Questions

To provide a richer, more nuanced understanding of participating youths' attitudes and experiences, several open-ended questions were included in the youths' weekly reflections. When asked how the YCC had affected him or her, one participant remarked that it "has affected my perspective of what is my community and it has helped me on many life skills that will help me later in the future. For example, presenting in front of a group and speaking what I feel needs to be heard, my opinion." Others responded that participation in the program "has helped me be more confident in what I do and what I believe"; "become a more outgoing person"; and "become more active in my community and actually feel like I'm helping and doing something good." Youth members also commented that they had a better understanding of how pesticides and other environmental exposures could affect their health.

When asked whether they would recommend the YCC to other youth, all but 1 of the 15 youth responded in the affirmative. In one typical response, a youth remarked, "I would because the YCC gives a good experience to make us more comfortable with speaking to different groups and adults. It

Table 2. Change in Youths' Perceptions of Their Attitudes and Abilities in Five Key Domains at Two Points in Time ($N = 15$)

Item From Questionnaire	In 2011 *M* (*SD*)	In 2012 *M* (*SD*)	One-Tailed *t* Test
ACTION SELF EFFICACY			
I can work well with a group of other students to organize a program or event at my school.	4.5 (0.5)	4.7 (0.5)	0.09
I can make a real difference in improving my city.	4.3 (0.6)	4.1 (0.6)	0.78
I can make a good presentation to students at my school on an issue I care about.	3.6 (0.7)	4.2 (0.7)	0.03*
I can make a good presentation to my teachers and principal on an issue that I care about.	3.6 (1.0)	4.3 (0.7)	0.00*
I can develop a research tool that gathers useful information.	4.1 (0.5)	4.0 (0.7)	0.62
I can use research results to come up with realistic recommendations.	3.9 (0.6)	4.2 (0.6)	0.11
SOCIOPOLITICAL SKILLS			
I am often a leader in groups.	3.5 (0.8)	3.9 (0.7)	0.03*
If I want to improve a problem in my city, I can work effectively with other students on this issue.	3.7 (0.5)	4.1 (0.7)	0.01*
I know how city rules and policies are made	3.1 (0.7)	3.4 (0.9)	0.13
LEADERSHIP EFFICACY			
I am good at leading groups.	3.8 (0.8)	4.0 (0.7)	0.11
I am good at organizing people to get things done.	3.9 (0.7)	3.9 (0.7)	0.50
I am good at getting other people to follow my ideas.	3.8 (0.7)	3.9 (0.6)	0.50
MOTIVATION AND INFLUENCE			
It is important for youth to try to improve our community or city even if we can't always make the changes we want.	4.5 (0.6)	4.6 (0.6)	0.38
Students should work to improve our school even if we can't always make the changes we want.	4.5 (0.5)	4.5 (0.6)	0.38
PARTICIPATORY BEHAVIOR			
I have made a presentation to a group of people I don't know.	4.1 (1.0)	4.1 (0.8)	0.50
I have spoken with adults in my school about issues that I want to improve at the school.	3.2 (1.1)	3.7 (1.0)	0.03*
If issues come up that affect students at my school, we do something about it.	3.7 (0.8)	3.5 (1.2)	0.92
If issues come up that affect youth in my city, we do something about it.	3.7 (0.7)	3.7 (1.0)	0.50

Note: Questionnaire was administered to 15 YCC members prior to action component of PhotoVoice project and 10 months later.

SCALE KEY: 1=Strongly Disagree, 2= Disagree, 3= Neither Agree Nor Disagree, 4= Agree, 5= Strongly Agree.

* $p = < .05$.

helps us become more familiar with our abilities and prepares us for future decisions." Another wrote that the program had provided "a great opportunity for all of us to see how we can detect good and bad things and actually do something about it little by little. It's showed me how to speak to people about the problems we need to solve and how to actually make things happen." Still others commented on the program's being "a great way to make positive change, the change you would want to see," and that participation "has helped me further develop my leadership skills [and given me] the opportunity to meet youth from other high schools." Several others noted that the combination of skill building and being able to make a difference in their community, while "having fun" in the process was a major strength leading them to recommend the program to others. The only person who reported that he/she would not recommend the program declined to state a reason.

Although most open-ended comments were positive, participants also raised a number of concerns when asked about the challenges faced, including conflicting time schedules, and "[getting] to talk to people about what we are doing and our [action] project." Transportation also was considered to be a major challenge for participants, whether getting rides to Saturday meetings from parents who worked weekends or finding other means of transportation. Transportation problems also were cited as obstacles to "getting my assignment done sometimes" and were particularly of concern when they prevented some youth from getting to such special events as the YCC co-organized 5k Run/Walk.

Some participants also found group dynamics to be a challenge. As one student remarked, "Having other people talk and get out of the conversation" was distracting, while another similarly commented on the problem of sometimes "getting off track with a subject we were discussing." As noted above, however, and despite these very real concerns, responses to the open-ended questions tended to stress the positive impact the program was having on participating youth. For one, the desire to "have more times to speak on the community events" was seen as a positive affirmation of increasing leadership and pride in the work being done collectively. As another participant reflected, "You guys really have helped me grow as a person and [the YCC] has helped me understand that things can occur and change the community."

Although we have summarized the quantitative and qualitative evaluation findings separately, the combined data from these two sources suggest an increases in youth efficacy, sociopolitical awareness and skills, and participatory behavior. The youths' significant increase in perceived ability to "work effectively with other students" on a problem affecting their community matched the youths' reflective comments following weekly PhotoVoice sessions concerning their ability to "become more active in my community" and work with others to help bring change.

DISCUSSION

As in other PhotoVoice projects,[2,3] the Latino youth participants in this study were able to identify features of their environment that impacted the health and well-being of their community. Youth were given the opportunity to present their findings to community leaders. We aimed to further develop their leadership skills by allowing them to plan and develop projects aimed at changing the environment in which they live. Common challenges noted by youth in other low-income communities of color were also found in this semi-urban agricultural community, including poor access to healthy, affordable foods and safe spaces for physical activity, and ease of access to tobacco products.[31–33] Finally, the YCC youths' identification of community strengths (e.g., helpful community-based organizations and adult role models) and their commitment to bringing their findings to the attention of civic leaders, was similar to those found in several other youth PhotoVoice projects.[8,9,34,35]

Like the urban Youth Empowerment Strategies! project in West Contra County, CA.,[9] the YCC PhotoVoice project also demonstrated individual change as a result of participation. As noted, for example, significant improvements were seen on five questions capturing key domains of interest, such as perceived sociopolitical skills, ability to make effective presentations, and confidence in one's ability to work effectively with other students to try to help address a problem in their city. However, a major limitation of this study involved the fact that the survey used to measure perceived individual level change, while administered twice over a 10-month interval, was not administered at baseline. Since substantial change could have occurred over the earlier (pre-action) phase of the project, it is likely that the survey evaluation results underestimated the extent of change that may have occurred. Further, the

youths' normal maturation over the course of the project may have affected their responses, and the lack of a control group precluded our ability to rule out maturation as an important confounder. At the same time, youth participants' written reflections and participant observation data are suggestive of the likelihood of at least modest individual level changes as a result of the program.

An important difference between the YCC PhotoVoice project and most other youth PhotoVoice efforts was that we sought to use this methodology in an urban agricultural Latino/a community as part of an effort to build youth leadership in environmental health. Projects including the West Harlem Environmental Action (WE ACT)'s "Earth Crew" summer leadership program, while not using PhotoVoice per se, have demonstrated the utility of such training both for youth development and cultivation of the next generation of environmental health leaders.[36] To our knowledge, however, the YCC project may be the first to combine environmental health leadership training with PhotoVoice among urban agricultural Latino/a youth. With the important exception of the project of farmworker youth in North Carolina[15] that focused on immigration most of the PhotoVoice projects in the U.S. to date, have focused on urban/metropolitan areas.

As in the YES! Project[9] and other youth participatory action research efforts,[4,9,37,38] the YCC PhotoVoice project emphasized the importance of attending to the social as well as educational needs and interests of youth participants. We therefore consciously attempted to balance task aspects of each session (e.g., dialoguing to "dig deeper" into the root causes of problems being explored) with elements that were fun, including ice breakers, healthy snacks, field trips and other activities. Together with the provision of new information on environmental health, and skill development in areas like public speaking and problem analysis, these more social elements helped create an experience that was interesting and entertaining for youth members, while also cultivating team work and sense of community.

LESSONS LEARNED

Training youth from a low resource community in the field of environmental health science presented several challenges. Participants live in a community, which, while resilient, has schools with substandard education, few opportunities for positive youth development, and elevated rates of youth violence. Youth reported that lack of opportunities for their own development, and stigmatizing media reports and attitudes about local youth, compounded these problems.

Scheduling conflicts presented a challenge for the YCC project. Students had other priorities such as athletics, academic and other extra-curricular activities, jobs, caregiving for younger siblings, and cultural events such as Quinceañeras (a special celebration of Latinas' 15th birthdays). Meeting location (a public library) and transportation also posed obstacles, as many youth lived beyond walking distance, and public transportation, while occasionally used, is under-developed in Salinas. Since many parents work on Saturdays when meetings were held, getting rides was also difficult for some.

To help address these constraints, YCC staff members maintained a strong and regular communication system and were flexible in scheduling sessions and other community events. Youth authors also commented on the importance of including participants who were dedicated to the goals of the YCC and have sufficient time to participate in program activities. Providing transportation may be useful, however in our case, university liability precautions prevented such efforts.

A valuable lesson from this study is that it is important to capture questionnaire data at the initiation of a project. The evaluative data collection through our 43-item survey, while helpful at two data points, lacked the important initial measurements that would have allowed a more accurate assessment of the project's impacts on individual participants' self-efficacy and attitudes in a variety of areas.

A related lesson learned involved the importance of using innovative methods to help youth learn about ethical issues in research. As Wang and Redwood-Jones[39] have noted, "PhotoVoice training never begins with camera instruction, but with a group discussion about the use of cameras, power, and ethics, as well as the responsibility and authority conferred on participants with cameras." Although we devoted a session to teach YCC members about research ethics, innovative methods were needed to help them engage more actively and effectively in learning this important material. Consequently, a university student team member developed a "Research Ethics Jeopardy™ Game, which was successfully used with these and other youth. This game is modeled on the popular Jeopardy™ television quiz show. The Research Ethics Jeopardy™ Game

helped youth work in teams and to better understand the rationale for human subjects protection processes. In this game, youth learned the importance of respect for persons, beneficence, justice and other key concepts in research ethics. Fun tools such as this game may help better engage youth and community members in research.

A final challenge faced in our PhotoVoice project involved the slowness of change, particularly when government or other bureaucracies is involved. Methods such as force-field analysis[40,41] and power mapping[42] as well as the Community Action Model (CAM) developed specifically for youth problem-solving and civic engagement[43] may be helpful in this regard. As suggested by Wang and Burris,[44] Israel et al., [45] Minkler[35] and Garcia et al.[46] however, the slowness of change and the commitment of participatory research to action for community or social change mean that planning for continuity of involvement beyond the funded project period is critical. In the case of the YCC project, while one action project (the 5k run/walk) was successfully planned and executed, the more involved development of a school and then district-wide recycling program will require continued effort into the future. Including the continuation of such projects in new funding applications will help ensure opportunities for youth engagement and their ultimate experience of success and empowerment in relation to these efforts.

CONCLUSION

We present the genesis, implementation and initial outcomes of a PhotoVoice project aimed at creating a cadre of urban agricultural area youth capable of identifying environmental health issues, while building their leadership and sociopolitical skills for tackling a wide range of challenges as they mature. The YCC PhotoVoice project appears to have been successful with respect to the core goals of PhotoVoice: (1) improving youth's understanding of community needs and assets, (2) enhancing their engagement in data collection and interpretation, and using findings for action and advocacy, and (3) creating conditions in which the youth could experience increased sense of empowerment.[3] By focusing on and involving Salinas high school youth in a visual CBPR project, we have chosen one path to potentially raising environmental health awareness in the larger community. Although not without significant challenges, the success of this PhotoVoice project with Latino youth adds to a growing evidence base on the utility of this visual participatory research method for engaging young people and in the process, helping achieve both individual and community level benefit.

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