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Mapping as a Means of Farmworker Education and Empowerment

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Abstract

Mapping is a simple activity that can be effectively linked to popular education of non-students. Mapping exercises have the potential to contribute to profound shifts in thought because the activity simultaneously draws on and challenges deep-seated experiential knowledge. The transformative potential of mapping is illustrated with health-promoter workshops for Latino migrant farmworkers in Benson, North Carolina, that took place in 1998 and 1999. The workshops are part of a larger project designed to reduce pesticide exposure by using community participatory research to develop and disseminate culturally appropriate teaching materials among Latino workers.

Keywords

radical pedagogy; popular education; empowerment; farmworkers; mapping exercise

As Paolo Freire and others have demonstrated, mundane experiences can be a powerful first step in the learning process (Freire 1970, hooks 1994, Wallerstein and Rubenstein 1993, Perez 1997). Mapping the everyday details of our lives can be particularly useful in this regard, especially beyond the classroom with non-student groups. When such contexts include language or literacy barriers, mapping exercises and visual lesson plans can provide the basis and motivation for further learning. By literally drawing the facts of their lives in black and white, non-students have the opportunity to both affirm their own knowledge and begin to pose challenges for their ideas.

Freire's well-known notions of empowerment, popular education, and radical pedagogy emerged from his highly successful literacy programs in urban Brazil. In this approach, the goal of education is to encourage people to act in ways that increase their control over their personal and community lives in order to create an impetus for social justice. Emotionally charged words and pictures are central to Freire's method of generating discussion and

action. As in our example below, words and images from daily life experiences are most effective in generating dialogue that can lead to learning. Freire's techniques of popular education have subsequently been a catalyst for a wide variety of educational endeavors including worldwide programs in literacy, English as a second language, health education, hospital worker education, youth programs, college courses, and community development (Kar et al. 1999, Greenstreet 1999, Swee-Hin and Floresca-Cawagas 1997). One of the most successful on-going experiments with empowerment education in the United States is the Highlander Education and Research Center in Tennessee (Wallerstein and Weinger 1992).

Studies of radical pedagogy demonstrate that education plays a complex role in social justice and social change. Educators debate where such teaching methods are most needed, where they can be most effective, who the target audience should be, and whether to work with popular cultural material or engage "high" cultural forms as well (Mayo 1999, Aronowitz and Giroux 1991, Cebotarev 1991). Most scholars agree that education can play a profound role in social change if alliances are cultivated with broader social movements (Swee-Hin and Floresca-Cawagas 1997, Hammond 1999). Even in the best context, however, there is a tension between liberatory goals of radical pedagogy and status quo outcomes. Thus, some educators suggest the need to work inside and outside formal institutions (Freire 1998, Gadotti 1996, La Belle 2000). In this way, educators expand their "sites of practice" and reach adults and other non-students who, in some cases, are most open to a reflexive critical dialogue (Mayo 1999, De Jardon 1999, Hopfer 1997, Walters 1999). It is also essential to expand beyond the classroom to those who have been excluded by racialized and other discriminatory processes (Hall 1996, hooks 1994, Mayo 1999).

Like other educators, geography educators who are committed to social justice need to see themselves as part of a broader community, not just as educators in the classroom (Smith 1995). They must find ways to bring geographical ideas to wider audiences, particularly those groups who are actively engaged in, or may become engaged in, social struggle. In this way, geography educators link ideas to action, a hybrid activity Freire calls "praxis." Harvey's (1973) classic *Social Justice and the City*, in which he showed that ideas, in and of themselves, can have radical or status quo implications, certainly brought widespread attention in the discipline to the concept of social justice. More recently, an introductory textbook acquaints students with ideas that explicitly concern social change action (Blunt and Wills 1999). Geography educators' roles are further complicated by the fact that classrooms are key social reproductive sites for the transmission of values (Merrett 1999). Some recent papers have addressed these complex issues through a focus on methods such as group work and curricular innovations such as women-focused lessons that can contribute to student empowerment (Burkill 1997, Stanier 1997, Nairn 1997). What are some of the constraints in putting these ideas into action? Sanders (1999) has shown that some of the barriers may be quite personal. At a National Science Foundation workshop designed to remedy disparities among males and females, participants were uncomfortable in assuming the role of change much preferred a "bank-agent (Sanders 1999). Theying model of education" in which educators deliver knowledge to students. Identifying a different sort of obstacle, Warf (1999) suggests that geography educators and research-oriented geographers can benefit from more dialogue with each other. A first step for geography educators would be to recognize education as a profoundly social and political process. Researcher-oriented

geographers, on the other hand, need to explain current geographical ideas in accessible language (Warf 1999). In a preliminary way, this is precisely what we hope to do in this article.

In a community-based research and education project, we designed an exercise based on Freire's principles. In our example, the non-students were Latino farmworkers in North Carolina. While our short-term goals were more modest than many of the educational programs mentioned above, we were convinced that the empowerment technique of focusing on daily experience would provide an adequate first step in what was potentially a long-term educational process. Therefore, we designed a mapping exercise as a means of engaging Latino farmworkers in discussions about health beliefs, behaviors, and injury prevention. Non-students, in this instance, sacrificed a weekend day of rest in order to participate in training sessions. Mapping itself was one part of a daylong workshop for health promoters who had agreed to share health knowledge and promote safe work practices with other farmworkers when they returned to their regular employment in the fields. Creating visual representations of workplace layout is particularly potent for engaging workers in discussion about potential hazards (Wallerstein and Rubenstein 1993, 62; Weinger and Lyons 1992, 680). The visual element, in particular, helps to bridge variable levels of literacy and language barriers. The visual document also helps students (and facilitators/teachers) to identify constraints on safe work practices. Naming and discussing such difficulties is a first step in gaining a measure of control over one's work life.

We believe that similar kinds of mapping exercises might be useful in other settings (e.g., community outreach, prison education programs, adult literacy projects, college classrooms, welfare alternatives education). We suggest that mapping is a simple activity that can lead to profound shifts in thought and the ignition of critical consciousness, because mapping activities simultaneously draw on and challenge our most deep-seated experiential knowledge. Mapping ordinary daily experiences is effective with non-student groups if the participants are given some freedom to set the agenda and decide which issues in their lives are most worthy of study, dialogue, and action.

Many geographers use classroom exercises that map experiences from daily life (Cromley and Cromley 1986, Gould 1983). The most common lesson plan of this type may be the mapping of activity spaces. The activity space is the "spatial network of links and activities, of spatial connections and locations, within which a particular agent operates" (Massey and Jess 1995, 54). College students can construct maps of their own activity spaces and use the maps to discuss and reflect on connections between local and global processes. This exercise provides a simple yet compelling way to encourage students to think critically about contemporary globalization. As Massey and Jess (1995) note, the idea of an activity space is not a precise theoretical concept yet is a useful heuristic device to help us into a particular way of thinking about the spatial organization of society. Another common mapping exercise in geography classrooms involves constructing mental maps to highlight one's knowledge (and lack of knowledge) of particular places and regions (Miller 1995, Chiodo 1993, Heatwole 1993). Critical mapping exercises that stimulate community empowerment by probing the limits and possibilities of maps as representational forms are less common but do exist (see McCann 1998).

Visual representation, such as the maps in our exercise, may be useful in a number of diverse teaching/learning contexts that have not been fully explored. Outreach programs in prisons might find this technique effective because it can transcend variable levels of literacy and different language backgrounds. Similarly, non-students or non-traditional students involved in welfare-to-work programs might find mapping exercises to be a useful means of identifying some of the socio-spatial barriers in their lives. For instance, drawing the daily transportation details of their lives might be a first step in imagining and working toward a different reality. On the other hand, college students in a typical classroom setting might employ a mapping exercise as a means of documenting and discussing campus violence. College students may also benefit, and find a measure of personal empowerment, from life-story mapping as a means of exploring personal identity and family history (Stanley 1998) or the closely related lesson plan of using travelers' diaries to map migration (Hull 1994).

We base our argument about the transformative power of mapping on health-promoter activities in Benson, North Carolina, that took place in the summers of 1998 and 1999. These workshops were an integral part of a broader four-year study titled Preventing Agricultural Chemical Exposure among North Carolina Farmworkers (PACE). PACE is a community-based participatory health project involving migrant and seasonal farmworkers, a poor and medically underserved population for whom community participation in health research can be simultaneously empowering and culturally appropriate (Arcury et al. 1999). To provide context for what follows, we first present an overview of the situation that farmworkers encounter in the fields in contemporary North Carolina. We then briefly describe the PACE project and offer specific details on health-promoter workshops that are designed to promote behavior change in regard to safety and health in field work. Next, the mapping exercise from the workshops is described and analyzed. Finally, we offer suggestions about the wider significance of this teaching strategy.

BACKGROUND AND CONTEXT

Our example is drawn from PACE, a community-based participatory project in North Carolina, that addresses health concerns surrounding farmworker occupational exposure to pesticides and other agricultural chemicals. It was initiated as a partnership of university (University of North Carolina at Chapel Hill and Wake Forest University School of Medicine) and community representatives (the North Carolina Farmworker's Project [NCFP]). This four-year endeavor is funded by the National Institute of Environmental Health Sciences as part of the Community Based Prevention/Intervention Research Project in Environmental Health Sciences initiative (RFA ES-96-008). The desire to respond to the RFA came initially from university researchers who had been involved in issues of migrant health and saw this program as an opportunity to address the specific issue of chemical exposure. NCFP, as a community-based organization, became involved in the initial stages of proposal development.

North Carolina is a significant setting for farmworker education, as the state ranks fifth in the nation in terms of the number of farmworkers. Recent estimates place the number of migrant workers and dependents in North Carolina at 140,000, with twice as many seasonal farmworkers (North Carolina Employment Security Commission 1995). In the United

States, there are an estimated 4.2 million seasonal and migrant farmworkers and their dependents, with 1.6 million classified as migrant. Migrant and seasonal farmworkers now work in at least 42 of the 50 states (Health Resources and Services Administration 1990). While some areas of the United States have routinely employed large numbers of seasonal and migrant farmworkers, other areas are experiencing a dramatic increase in these workers as family labor gives way to hired labor, as well as a change in the ethnicity of workers. Ten years ago in North Carolina, for instance, most farmworkers were African-American. Today only 10% are African-American; most, like the rest of the U.S. farmworker population, are Latinos (Mines et al. 1997). Such rapid ethnic change in the state's farmworker population has made pesticide exposure among the state's farmworkers a more immediate and more significant challenge than it might have been otherwise. Language barriers, rapid geographic mobility, and wide variations in levels of literacy are only some of the more obvious problems for the state's Latino farmworkers as they confront daily risks of pesticide exposure.

Changes in the distribution and composition of the farmworker population thus have resulted in considerable demand for effective and culturally appropriate health education materials that can be used with farmworkers and their families by public and private providers of health services. This need intensified in 1992 with the promulgation of the U.S. Environmental Protection Agency (EPA) Worker Protection Standard (WPS), and with full implementation of regulations in place in April 1994. Among other requirements, the WPS states that farmworkers must receive worker-safety training that covers 11 specific topics related to pesticide exposure. As part of the implementation of the WPS, the EPA commissioned the development of health education materials to be used by farmers and health educators to meet the farmworker training requirement of the WPS. PACE project members reviewed diverse training materials (Quandt et al. 1999) and are developing materials that both complement and extend items currently available.

The goal for PACE is to reduce pesticide exposure among farmworkers by using community participatory research to develop (through formative research), implement, evaluate, and disseminate culturally appropriate interventions. Community participation is designed to promote broad-based community involvement during the development of the intervention, as a foundation for the subsequent steps in the project (Arcury et al. 1999). In addition to the participation of farmworkers, the PACE project has reached out to other stakeholder communities including farmers, health care providers, and the Cooperative Extension Service.

PACE operates in an eight-county area in central North Carolina, the region with the state's highest concentration of farmworkers. Agricultural products of the region include tobacco, cucumbers, sweet potatoes, and a number of other fruit and vegetable crops. PACE focuses on farmworkers involved in tobacco or cucumber production, as these involve large amounts of chemicals and hand labor throughout the agricultural season.

Preventing or reducing exposure to agricultural chemicals is an important focus for health educators serving migrant and seasonal farmworkers and their families (Arcury and Quandt 1998). Acute chemical poisoning can be life threatening, and chronic low-level exposure to

pesticides and their residues has been implicated in neurological impairment, cancer, and reproductive problems (Arcury and Quandt 1998). Agricultural chemicals include a variety of pesticides (e.g., herbicides, insecticides, fungicides), fertilizers, and ripening agents. The particular chemical used depends on the type of crop cultivated, time of year, weather conditions, and types of pests present. While some crops have fairly standard application practices, others (e.g., flue-cured tobacco) receive chemical treatment specific to micro-environmental conditions in particular fields. These varying patterns of usage and the fact that farmworkers frequently work in several different crops in a year make it difficult for workers to know to what chemicals they might be exposed. Therefore, a safety training that promotes awareness of a variety of potential hazards and individual analysis of the work environment is appropriate. By encouraging independent analytical thought, PACE'S health-promoter workshop provides a crucial first step for workers who must negotiate such complex and changeable work-places.

Prevention of pesticide exposure involves avoiding direct contact with concentrated chemicals during mixing and application, as well as minimizing contact with pesticide residues on plants, soils, and farm equipment. Simple behaviors are involved. Washing hands before eating, drinking, and smoking reduces the risk of ingesting pesticides. Wearing clean work clothes daily that cover much of the skin, washing work clothes separately from household clothes, and washing hands before toileting reduce the risk of absorbing pesticide residues through the skin. Removing work shoes outside the house and washing field produce before bringing it into the house are important because these steps break the pathway of chemicals into housing.

HEALTH-PROMOTER WORKSHOP

The PACE project provides direct on-site pesticide education as well as a health-promoter workshop designed to encourage on-going education and increased awareness of pesticide risks and protective behaviors (Arcury et al. 2000). Workshop attendees were volunteers from farm labor residence sites (e.g., on-farm camps and trailer parks) where the PACE project had earlier conducted a direct training of EPA Worker Protection Standards information for groups of farmworkers. Volunteers traveled to weekend workshops at the NCFP office in Benson, North Carolina. Armed with more knowledge, these health-promoters returned to the fields with distinctly colored baseball caps that identified them to other farmworkers as health-promoters. This approach is intended to have a multiplier effect as farmworkers and resource people share ideas in intensive workshops and subsequently with a larger target population. Educational initiatives on pesticide risk in Pennsylvania and Nicaragua have successfully employed this multiplier strategy to reach large populations (Weinger and Lyons 1992).

The promoter training-program is intended to supplement the direct on-site training by providing lay advisors who have additional safety training and problem-solving skills to assist fellow workers in seeking remedies to pesticide related hazards in the farm work environment. In 1999, 45 promoters from 14 different sites attended; 21 promoters from 14 sites participated in the 1998 sessions. Workshops were conducted in Spanish, although language is a more complex problem than it might appear to be in this context. Spanish is a

second language for some farmworkers who speak indigenous Mexican or Central American languages. Likewise, although PACE facilitators are quite fluent in Spanish, they regularly encounter language issues that result from differences in facilitator's national backgrounds. In 1999, for instance, facilitators were from Honduras, Dominican Republic, and the United States. Ninety percent of the farmworkers, on the other hand, were from Mexico.

MAPPING EXERCISE

The mapping exercise serves a number of purposes at the health-promoter workshops. It is simultaneously an icebreaker, a means of affirming participants' unique experiential knowledge, and a starting point for assessing each participants' knowledge of health risks in their environment. The latter two issues are significant for PACE'S purposes. Mapping one's work and living environment documents the immediate situation, while providing the key for critical analysis. Used in conjunction with other methods of popular education, mapping is a technique that can lead to dialogue, reflection, and critical thinking. In this process, a simple technique can therefore provide a stimulus for action and empowerment. In this section, we describe the mapping exercise in a general way and then provide a few specific illustrations of the transformative potential of mapping from PACE workshops.

Ordinary farmworkers who attend the health-promoter workshop draw the maps we discuss below. Teams of four to six workers from the same site were initially asked to create a table-top map of the farm layout, including fields, housing, barns, machinery, eating areas, portable toilets, and other objects they deem relevant. Large sheets of paper and markers were provided for this preliminary step. Participants were then asked to identify the different places where agricultural chemicals can be found. These places were colored with a red marker.

The mapping exercises involved considerable physical activity as participants moved about the room to produce colorful maps on large pieces of paper. The NCFP office is a converted commercial storefront building. This setting invites social interaction because it has been set up to provide a workspace for diverse activities (note the bulletin boards filled with newspaper clippings and announcements in the background of Figure 1). At the beginning of the weekend workshop, we asked farmworkers to produce maps of their own work environment and living arrangements as described above. As soon as drawing materials were distributed, farmworkers quickly began to work on these maps and were engrossed in the assignment (Figures 1 and 2).

Later, each group was asked to describe their map (or maps) to the others (Figure 3). They enthusiastic discussion. Standard discussion questions for beginning to identify exposure hazards are:

Where do you find pesticides on the farm?

Where do you think most people are exposed to pesticides?

Where are the hand washing facilities located?

Where are the bathrooms in the field?

Where do you wash clothes?

The maps reflect diverse situations on North Carolina farms. Pesticides may be stored near farm equipment as seen in Figure 4, or perhaps near an occupied trailer, as seen in Figure 5. In either case, workshop participants could discuss potential pathways of exposure and possible preventive measures. When these points had been made, the more difficult and more abstract notion of residue was introduced. Because formative research had shown that farmworkers do not understand that pesticides leave residues which should be avoided (Quandt et al. 1998), PACE investigators have spent considerable time and thought developing a tangible way to represent the concept of residue. They have developed a residue symbol, an anthropomorphic ghost “El Terror Invisible,” that is used throughout the training materials to reinforce the idea.

Farmworker occupational environments and living arrangements in North Carolina often overlap to some degree. Thus some participants in the health-promoter workshop produced one map that showed the continuous spaces and layout of the farmstead and the living area within (or adjacent). Other participants needed to produce two (or more) maps to describe the reality of their own work life and home life.

How does a map of one’s working environment and living arrangements inspire critical thinking about pesticide exposure and risk? In the PACE project we identified four principal avenues for critical thought: examining the locations of certain items in the house itself; discussing the membership of the household; examining relative locations of such things as household and field; and discussing possible vectors of risk, exposure, and transmission. Each of these is considered below.

Each map drawn by a health-promoter documents a number of simple yet crucial details about the house (or worker camp) in which the health-promoter lives. The most significant locations for our purposes include the location of bathing facilities, kitchen (or communal food preparation areas), laundry facilities, and waste receptacles. Representing these items on a piece of paper can provide the impetus for asking questions about the adequacy of bathroom, kitchen, and laundry facilities (for the numbers of residents, for the tasks required, for safety and safe behaviors). Another consideration may be the storage of clean work clothes, storage of soiled work clothes, storage of unwashed field produce (e.g., watermelons, eggplants, corn, okra), and storage of any other contaminants.

At the bottom of each map, participants were asked to list the members of their households. Specifically, they were prompted to consider whether there were children or other members of the household not engaged in farmwork. If so, they could make a map overlay that illustrated the activity spaces of these other persons. With this document, they could begin to ask themselves whether there might be places in which young children might be at particular risk.

Relative location is another important consideration, and one which is quite easy to discuss after making these simple health promoter maps. For the PACE study, we asked participants to map and to consider the relative locations of chemical storage, farm implements, households, and farm fields.

Finally, it is essential to discuss the vectors of exposure and transmission. Maps of each person's living arrangements provide an easy way to begin this discussion. At this stage of the workshop, PACE health-promoters were encouraged to consider wind currents (from proximate fields), direct contact (e.g., touching, children playing), and such hazards as spills, dumping, and waste storage.

Although mapping exercises in themselves do not change the difficult conditions encountered on North Carolina farms, they provide an initial means of dialogue about pesticide safety. In the best case scenario, when such an exercise is linked to a larger popular education effort, it can be a tool for personal transformation (Friere 1970, hooks 1994, Mayo 1999). It can be one element that serves to strengthen social networks for subsequent collective efforts. In this way, mapping exercises that focus on daily life experiences can be a stimulus for the kinds of personal and social transformations that Freire considered the primary goal of education.

CONCLUSIONS

The PACE experience illustrates the power of simple mapping exercises to promote education, critical thought, and the potential for empowerment. We believe our methods are particularly important for non-students and non-traditional students, although the techniques will be beneficial for analyzing certain topics in traditional classrooms as well. One of the central strengths of the PACE exercise was that it reaffirmed participants' knowledge while provoking further intellectual questions and challenges. These dual elements have been crucial in our efforts. Farmworkers in North Carolina are better able to think critically about pesticide exposure when they feel some sense of personal empowerment. The mapping exercise helped to provide a sense of well being and empowerment because it was an active learning technique and, more importantly, because it demonstrated to each participant and to others the value of each participant's knowledge and intelligence.

Mapping is a common technique in participatory education and occupational training (Wallerstein and Rubenstein 1993, Weinger and Lyons 1992, Perez 1997). When applied to pesticide safety training, it provides an opportunity for farmworkers to demonstrate their knowledge of the workplace and visualize the sources and pathways of exposure. In a more general sense, mapping one's immediate work environment provides a visual way to interrogate one's control over the labor process. The visual element stimulates different sets of questions than verbal discussion alone might generate. Used in conjunction with other popular education techniques, therefore, this exercise may add complexity to notions of what is possible and how we may act to influence conditions in our workplaces and work lives.

The PACE exercise has considerable overlap with other mapping lesson-plans that focus on daily life experience, in that each is an active learning technique. In addition, each relies on the student's own knowledge as a starting point for further discussion. The student's experience—whether a college undergraduate or a Latino farmworker—is first validated and then used to illustrate social relationships across space that shape the individual's daily life. In the best of situations, such visual illustrations can be a first step in a transformative process.

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Figure 1.
Farmworkers drawing a map of their work environment.

Figure 2.
Team of farmworkers drawing a map of another work environment.

Figure 3.
Farmworker describing his map to workshop participants.

Figure 4.
Pesticide storage near farm equipment.

Figure 5.
Pesticide storage adjacent to a residential trailer.