Title

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Journal

Journal of Architectural and Planning Research, 27(2)

ISSN

0738-0895

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Publication Date

2010-06-01

Peer reviewed

UNDERSTANDING MINORITY RESIDENTS' PERCEPTIONS OF NEIGHBORHOOD RISKS AND ENVIRONMENTAL JUSTICE: NEW MODALITIES, FINDINGS, AND POLICY IMPLICATIONS

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There is a pressing need to more deeply understand how incompatible land-use patterns intersect with place attachment and experiences of environmental injustice. While environmental policy is strongly influenced by the classic, probabilistic model of environmental risk, *the present research instead aims to develop notions of environmental impact that more closely reflect the lived experience of community residents. This entails employing a phenomenological stance toward the analysis of environmental impacts, as well as research methods that seek to uncover the narratives and cognitive representations that residents actually employ. In our exploration of these issues in the town of Val Verde, California, we discover how a nearby landfill encroaches on the everyday lives of the residents in ways that go beyond the classic model of* risk. *For example, rather than employing a positivist measure of environmental hazard, residents experience the landfill viscerally and emotionally in terms of its impacts on their everyday lives. Broadly stated, analysis is not simply to be associated with thought, but also with lived experience. We conclude the article by reflecting on the implications of this type of research for policy analysis.*

INTRODUCTION

The primary motivation for this research is the desire to improve policies that address the needs and aspirations of communities. We are particularly interested in the issues of environmental quality and land use (*i.e.*, what land uses are approved, where they are located, and how to deal with conflicts between these uses, especially under rapid urbanization). Most broadly, we inquire into both the kinds of knowledge that are crowded out of the policy space and the necessary avenues for institutional reform.

We begin with the fact that there are always dominant conceptual frameworks that guide public policy. In the area of environmental quality, one such framework is that of *risk*, which is classically defined as the probability that the presence of a polluting land use can lead to adverse health effects among those who live and work around it. This dominant notion often turns policy discussions into a numbers game in which the goal is to ensure that measured or estimated *risks* fall below established regulatory thresholds (*e.g.*, *de minimis* cancer risks).

Our thesis is that community members experience environmental injury in ways that are deeper and more complex than this simple notion of *risk*. We proceed to investigate aspects of this experience in a community residing near a major landfill. To go beyond the dominant framework, however, it helps us to let go of the classic, probabilistic model of *risk* and open up our investigation to understanding how problematic land uses are experienced. We put the word *risk* in italics as a reminder that the term is to be used simply as a placeholder that is to be filled in with more faithful descriptions of lived experience. In fact, in our discussions with community members, we find ourselves talking about broader notions of place and visions of a better life. In this respect, we are informed by phenomenological investigations of place (*e.g.*, Casey, 1993; de Certeau, 1999; Relph, 1993; Seamon and Mugerauer, 1985). At no point in our discussions did we introduce dominant frameworks such as *risk* or *environmental justice* — this is a necessary prerequisite for what Spiegelberg (1982) has called phenomenological "intuiting." In fact, the researchers did not inject the landfill into the discussion until the residents broached the subject themselves.

It is clear, however, that our research in this community is not simply about the phenomenology of place but, more specifically, is about how the landfill enters into the lives of residents. As we will argue, the complex ways in which some problematic issue (such as a landfill) intrudes into the lives of community members creates a need for policy responses that respect this utter contextuality (Lejano, 2006). In this light, we found a need to use different methodologies and research artifacts to gain deeper insight into the day-to-day experiences of community residents. It is our belief that policymakers need to broaden their understanding of what constitutes policy-relevant knowledge and, correspondingly, what constitutes evidence (see also Chaudhury and Mahmood, 2008).

The reductionistic notion of *risk* traces its roots to the decision sciences. In particular, von Neumann and Morgenstern (1944) used the model of a lottery to construct a notion of *risk* as a pure probability of an uncertain negative or positive outcome. Subsequent investigations, notably by Kahneman and Tversky (1979), have shown that people do not perceive prospects as simple cardinal measures, whether on a probability or other scale. The general notion of *risk* as a positivist measure remains to this day and guides environmental policy. Conflicts about *risk* are interpreted as disagreements over measured values of these probabilities and outcomes. In this model, the problem can be solved by simply closing the gap (through better information or public-relations processes) between real, measured *risk* and public perceptions of it (*e.g.*, Lundgren and McMakin, 1998; Morgan, *et al.*, 2002). In our research, we are guided by the notion that conflicts over *risk* stem from the more basic fact that people understand *risk* in more complex and multidimensional ways than the traditional policy model allows and to a degree that better communication may never completely remedy. This sentiment is shared by other researchers in the fields of environmental psychology and risk analysis (Bickerstaff, 2004; Fischhoff, *et al.*, 1978; Rowe and Wright, 2001; Sjöberg, 2001; Slovic, *et al.*, 2004; Vaughan, 1995).

One rich source of insight into deeper structures of knowing is the very way that people talk. The study of narrative stems from the realization or claim that narrative is the most basic mode by which people transmit knowledge (Bruner, 1986; Griffin, 1993; Polkinghorne, 1988) and that, it stands to reason, narrative analysis

is a powerful way to uncover different knowledge (*e.g.*, see du Toit, 2009; Gadamer, 1960/1975; Lyotard, 1979; Ricoeur, 1991). We do not have to wonder, for the moment, if the way people talk truly represents the way they reason. We simply have to recognize that mere stories can embody a person's or community's complex experiences and moral deliberation and that conversations can integrate the diverse experiences, knowledge, and moralities found in a place (*e.g.*, see Forester, 1999). The other sources of content that we employ in this research are sketches done by community residents, both individually and as a group. In this way, we provide multiple forums for expression, including graphic instruments that allow communication of everyday experiences and sentiments that may be difficult to put into words. This is characteristic of the realm of post-normal science (Funtowicz and Revetz, 1994), in which knowledge uncertainty intersects with normative conflict and nontraditional instruments like sketches become most relevant.

The modalities of analysis that we are espousing have much to do with recent efforts to foster participative planning practices (Forester, 1999; Healey, 1996; Innes and Booher, 2005). As Mehta (1998) points out, current planning and policy institutions exhibit aspects of technocracy, where positivist, scientific frames of knowing crowd out other discourses, especially in formal decision making, a point made, too, by Lyotard (1979) in his contrasting positivist versus narrative knowledge. The alternative is an intersubjective, communicative type of rationality (Habermas, 1984). This, in turn, requires new institutional designs to allow alternative ways of knowing (Schneider and Ingram, 2007). Glicken (2000) calls for modes of risk analysis that value experiential knowledge, which nonscientists acquire individually, along with value-based knowledge, which resides in the community. We see this research as responding to this call for incorporating experiential knowledge into urban planning practices, as seen in the individually based cognitive-mapping exercises and in the shared group knowledge that emerged in the collectively drawn community vision maps.

METHODOLOGY AND CONTEXT

The study was conducted in Val Verde, California, a town with a population of just under 1,500 (U.S. Census Bureau, 2000). It is a majority Latino community (51.6% as compared to 44.6% for Los Angeles County) and low to middle income (annual per capita income of $15,626 versus $20,683 for the county). It is situated right next to the Chiquita Canyon Landfill, one of the largest solid-waste sites in Los Angeles County. Cancer risks to residents due to the landfill are estimated to be as high as 1,000 in a million, significantly higher than the federal guideline of one in a million (UCI, 2006). The present study was conducted with the help of URPAVV (*Union de Residents para la Proteccion Ambiental de Val Verde*), an environmental justice advocacy group composed of residents who lobby for better environmental conditions in the town. The movement began when the county proposed the expansion of the Chiquita landfill (County of Los Angeles, 1992). When the Val Verde neighborhood association settled litigation with the county, thus allowing the expansion to take place, the group vowed to continue the struggle against the landfill and formally formed URPAVV. Most recently, the county informed the public that it was considering expanding the landfill yet again (County of Los Angeles, 2005).

The Chiquita landfill, located in the town of Val Verde, has operated since 1972. In 1998, the California Integrated Solid Waste Management Board approved an expansion plan that increased the fill area of the landfill from 154 acres to 257 acres, meaning an increase in elevation by 180 feet (County of Los Angeles, 1996). This expanded the landfill's total solid waste capacity by 23 million tons. It is presently accepting 4,930 tons per day, and if it continues accepting at that rate, it will be able to operate until 2015. Note, however, that there is presently a proposal pending to add an additional 98 acres to its fill area. Chiquita is the second largest operating landfill in Los Angeles County and is exceeded in throughput only by the Puente Hills landfill, which accepts 12,250 tons per day (Alva, 2007). The residents of Val Verde sued the county over the most recent expansion but had to settle the suit in exchange for some compensation and increased environmental monitoring requirements. URPAVV represents a group of residents who are indignant over the settlement and continue to protest the landfill.

The situation in Val Verde invokes a common thread in the broader literature on environmental justice (EJ), which focuses on the ways and extent to which lower-income communities of color are disproportionately exposed to environmental *risk* (see Bullard, 1983; Mohai and Bryant, 1992; and UCC, 1987, for some of the

earlier definitive work on EJ). Landfills are a major example of environmental injustice — in fact, one of the very first studies on EJ, a report by the U.S. General Accounting Office (U.S. GAO, 1983), revolved around the siting of landfills. There is ample work in the extant literature on the direct impacts of landfills on nearby residents in terms of the objective measures used by the agencies (see Vrijheid, 2000), as well as on less direct impacts such as property devaluation (Nelson, *et al.*, 1997) and community concern (Elliott, *et al.*, 1997). As reflected in other cases in the EJ literature, the Val Verde case exemplifies a community's unfair treatment with regard to outcomes (*i.e.*, siting) and process (*i.e.*, exclusion from risk-assessment forums). Going beyond the literature, this research adds insights into how communities are excluded from process — in this case, it is the limitation of analyses to the narrower, positivist, and objective measures privileged by the agency, ignoring the broader, multidimensional ways of understanding employed by the community (see also Sassa, 2002).

The community group approached the university researchers with an existing agenda. The goal of the collaboration was a series of planning exercises revolving around improving the quality of life and infrastructure of Val Verde.

This article pertains to three community workshops that the URPAVV collaborative held over a period of six months in 2004. The first and third workshops involved cognitive- and collaborative-mapping exercises. The second workshop was devoted to the collection of personal narratives from residents. The latter involved face-to-face interviews, which consisted of both open-ended and semi-structured batteries of questions, with trained bilingual researchers since the participants spoke in both English and Spanish. The interviews were then translated and transcribed.

The participant pool included male and female Latino residents from a wide age range. Representatives of URPAVV invited members of the community who were not directly affiliated with their organization to participate. By drawing from a pool outside of the organization, our goal was to diminish participant bias. It is important to point out that the focus of the research was not on the statistical testing of hypotheses but on an exploratory attempt to uncover narratives of place and the landfill, so we did not seek a random or representative sample. Our research material consisted of personal reflections, cognitive mapping, collaborative mapping, and resident interviews, as discussed below.

Personal Reflections

We attempted to gain a direct insight into the experience of the place. This involved repeatedly visiting the community, taking photographs, meeting residents, and entering into the experience of the place. One of the authors has been working with residents in Val Verde for almost a decade.

Cognitive Mapping

To try to access residents' cognition of the place, we engaged members of the community and asked them to conduct a cognitive-mapping exercise. In doing this, we follow the lead of pioneering work on the use of cognitive mapping as a way to bring out people's understanding of place (*e.g.*, Appleyard, *et al.*, 1964; Lynch, 1960; Milgram and Jodelet, 1976; Orleans, 1973). We then interpreted patterns in these mappings. For example, in their studies of sketched maps of Paris, Milgram and Jodelet (1976) associated salience of features of place with the consistency of inclusion in residents' maps, the prominence of sketched features (*e.g.*, their size, location of icon, boldness of line), and other criteria.

Eleven adult residents (eight females and three males) from Val Verde were asked to sketch maps of their neighborhood. Each person was provided with an 11" x 17" (28 cm x 43 cm) sheet of paper and told they would be given about 45 minutes to complete the exercise. No other prompts or cues were given. After each resident finished her sketch, she was given a chance to annotate her map with comments, and if she wanted, to provide a subjective rating on a scale of -7 to +7 to represent the positive or negative effect of the particular landmark. The entire session took about an hour and a half. The researchers subsequently listed all the landmarks that were found on the maps and prepared an aggregate list.

TABLE 1. General overview of questions asked.

Opening Question: *Tell me about your thoughts (anything whatsoever) or experiences of living in Val Verde.*
Non-judgmental Prompts (followed by prompted responses): *Say anything that comes to mind, your views of what it's like to live here, things that affect you, anything.*
Follow-up Statements: *You mentioned it's all right living here ... why do you say so? Can you talk a little bit more about why you would say it's all right?* Or *You said there are some problems ... could you discuss them for a while? What do you experience? How do these things affect you?*
More Specific Questions: *Now I would like to hear what you feel or think regarding the problems in the community.*

Collaborative Mapping

Another research artifact was a set of collaborative maps that were produced as a group exercise (in contrast to the individual sketches discussed above). The collaborative-mapping session involved gathering approximately 20 residents around a large easel and contributing ideas to be captured on the large sheet of paper. One or two community members would then draw these on the map as the rest of the group watched. Two maps were produced: one was a vision of the positive aspects of Val Verde, and a second one portrayed what the residents thought were the most pressing negative aspects. It is important to note that these maps were not the researchers' idea, but the residents'.

We conducted an interpretive analysis of the collaborative mappings. The hermeneutic approach requires first immersing one's self in the images. This then leads to finding themes reflected in the drawings — most immediately, identifying key iconic features. This also involves studying graphic elements of the drawings.

Resident Interviews

We strengthened the observations of the above mapping exercises through face-to-face interviews with the same 11 participants. The interview protocol was comprised of a semi-structured series of general questions designed to capture how the participants understand and experience their neighborhood. Interviewers were trained to engage the participant in conversation without influencing his or her responses. In fact, mention of the landfill was not initiated by the researchers but only evolved as interviewees discussed their thoughts and feelings about Val Verde. The goal of the research design was to yield insights into how residents felt about Val Verde and, more specifically, how the landfill entered into the residents' experiences. In addition, the analysis illuminates the cognitive processes people use in understanding environmental *risks*, though we deliberately set aside the strong concept of *risk*, as well as any mention of the term. Using a funnel design, the open-ended interview became more focused as it progressed (Ericsson and Simon, 1994; Morgan, *et al.*, 2002). Interviewers referred to a worksheet of prompts and directions during the interviews (see Table 1), which generally lasted up to an hour, though several exceeded that. The interviews were taped and transcribed, and Spanish portions were translated. Later on, follow-up interviews were conducted with residents who indicated a desire to share more insights. All of these were done over the phone due to logistical problems with arranging face-to-face meetings. The above methods were pilot-tested with residents at a university housing complex.

ANALYSIS AND DISCUSSION

Agency's Analysis

First, we examine the official agency analysis in order to contrast this with the alternative modalities presented herein.

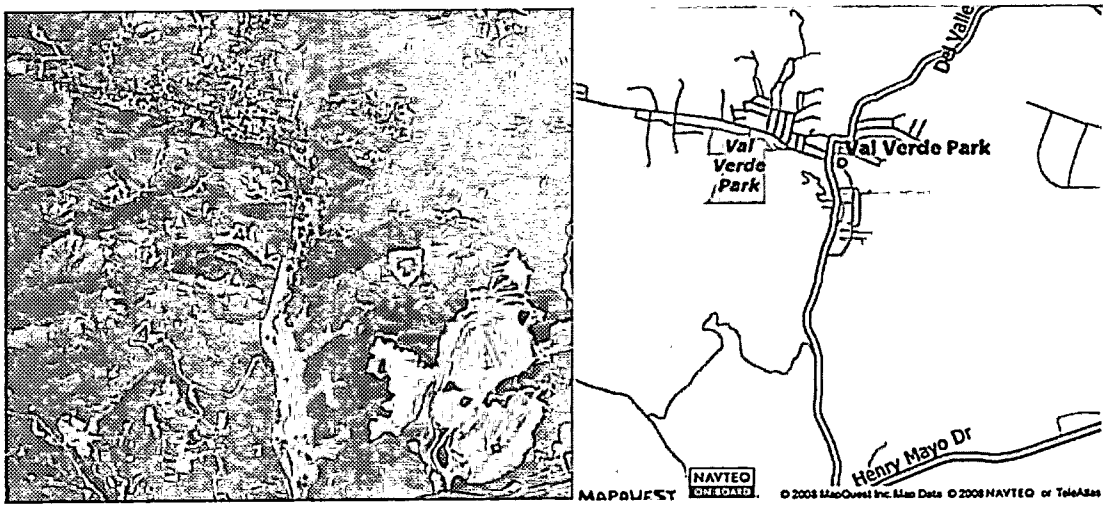

FIGURE 1. Aerial view and street map of Val Verde, California.

In the environmental impact report (EIR) for the last approved expansion plan, air-quality-related risks were dealt with in two ways. First, the impact of air toxins on the local community was estimated by calculating air toxin concentrations due to the landfill at the nearest residential area in Val Verde. The EIR concluded that the total additional cancer risk fell below the threshold risk level of 10^{-6} or one in a million, representing the probability of an exposed resident developing cancer as a result of air quality. The second calculation entailed comparing total emissions of non-cancer-causing criteria pollutants with thresholds for regional-level impacts in the South Coast Air Basin. The EIR concluded that total emissions fell under the basin's threshold levels (County of Los Angeles, 1996).

We next contrast the above representation of *risk* with the community's. For the agency, *risk* is defined numerically and corresponds to a fairly specific, narrower understanding of *risk* that is limited to:

- considering concentrations of air toxins listed by the State of California (numbering almost 300 carcinogens and almost 100 toxic non-carcinogens, in contrast to the thousands of toxic air constituents identified in bioassays and epidemiological studies);
- limiting effects to only cancer and non-cancer endpoints, including birth defects and neurotoxicity (leaving out odor, nausea, asthma, allergies, and other chronic endpoints);
- using the agency thresholds as categorical decision points (*i.e.*, reducing the question to a yes/no response);
- considering aspects of *risk* in a separate, piecemeal fashion (*i.e.*, not analyzing cumulative effects); and
- most fundamentally, reducing impact to direct biochemical interactions of the landfill gases with human organs (*i.e.*, leaving out stress and stress-related impacts, anxiety, nuisance, etc.).

In contrast, our data reveal how the community understands *risk* in its Gestalt — as an experience of manifold aspects that all contribute to multiple problems associated with the landfill. It is also important that none of the problems experienced by the community fall under the categories that the EIR analyzes as *risk*. This has implications for the methodologies we employ in analyzing the experience of *risk*. In the EIR, classic risk analysis provides probabilistic estimates of *risk*. It is clear that, in order to understand *risk* as experienced by a community, we need to go beyond these standard probabilistic estimates of *risk* and employ other modalities such as ethnographic interviews and cognitive mapping. Because classic risk analysis relies exclusively on objective information (in the sense that positivist data are considered objective), we recommend an alternative and broader approach that incorporates both subjective and objective modes of risk assessment.

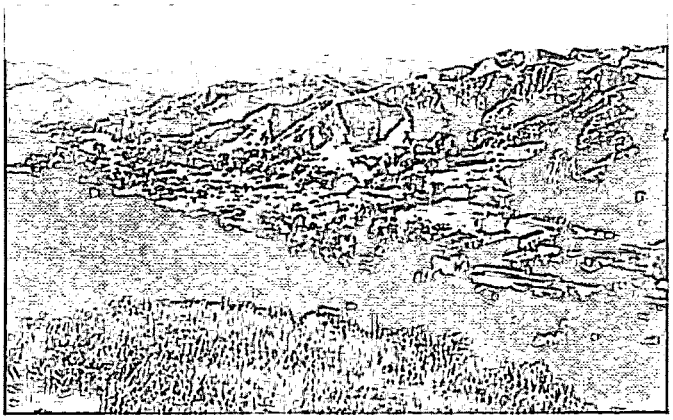

FIGURE 2. Bird's eye view of Val Verde, California.

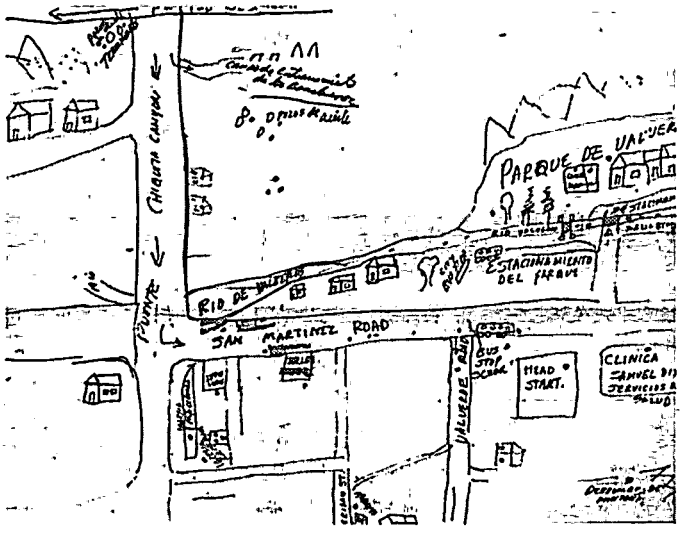

FIGURE 3. Resident's cognitive map of Val Verde, California.

Personal Reflections

The researchers began by simply spending time in Val Verde and drawing from their evolving impressions of the place. They also consulted several groups of graduate students regarding how they felt about the place the first time they were brought to it. For most, impressions of Val Verde begin with the entry into the town, which is through a long, narrow road that takes one by a rather colorful and dramatic series of hills. Coming from Los Angeles, the visitor is taken by the rustic color of the place. The town itself consists of loosely arranged rows of houses placed along intervals with enough randomness to bring an interesting spontaneity to the place. Most of the homes are small one- and two-bedroom wooden bungalows, many of them aging but reasonably well-kept, and the town has a gently rolling quality to it. There is an unmistakable charm to the area.

It is also important to note that one could visit the town for an entire day and not get a sense that there is a major municipal landfill nearby. The landfill itself cannot be seen from Val Verde, as it is tucked away behind a row of hills. Figure 1 shows an aerial photo and street map of the area, and Figure 2 provides a panoramic picture of the town. The landfill is on the lower right-hand portion of the map and aerial photo, bordered by the hills. Just north of these hills lies the town of Val Verde, strung out across the narrow canyon that extends to the northwest. The aerial view gives a striking image of how dominant a land use the landfill is. And yet, we remind ourselves, the landfill cannot be seen at all from the ground. Is it possible that the natural topography suffices to hide the landfill from the lived experience of the residents? On the other hand, if the landfill somehow affects life in Val Verde, in what way does it do so, and how is this reflected in residents' representation of the place?

Cognitive Mapping

Figure 3 is one of the cognitive-mapping sketches. The landfill certainly seems to be part and parcel of most residents' cognition of the place — it appears in seven of the 11 maps. The sketches show, too, how the landfill looms large in the residents' consciousness as a dominant feature of the place, even though, at ground level, it is not even visible to them. Of course, the landfill is not the only thing that appears on the maps. Other landmarks that appear on most of the maps include the clinic, Val Verde Park, San Martinez and Chiquita Canyon Roads, and invariably, each mapmaker's home.

In many cases, the landfill is indicated somewhere near a corner of the page (*e.g.*, upper right-hand side of Figure 3), almost as if to show how it is tucked away at the edge of their everyday world. But, inevitably, it is there on the page and, by extension, in their cognition. Note that there is no Spanish word for landfill, and in some of these maps, this landmark is indicated as *basura* (garbage) or *basurero* (garbage collector).

Collaborative Mapping

We found the results of the group mapping sessions to be powerful, direct expressions of the residents' experience (Figures 4 and 5). We should keep in mind that these two maps were meant to be graphic embodiments of what the residents wanted to say as a group. The icons on each page were not simply contributed without reflection but were first discussed by the group. So, in a sense, the images in Figures 4 and 5 convey the shared experiences of the residents.

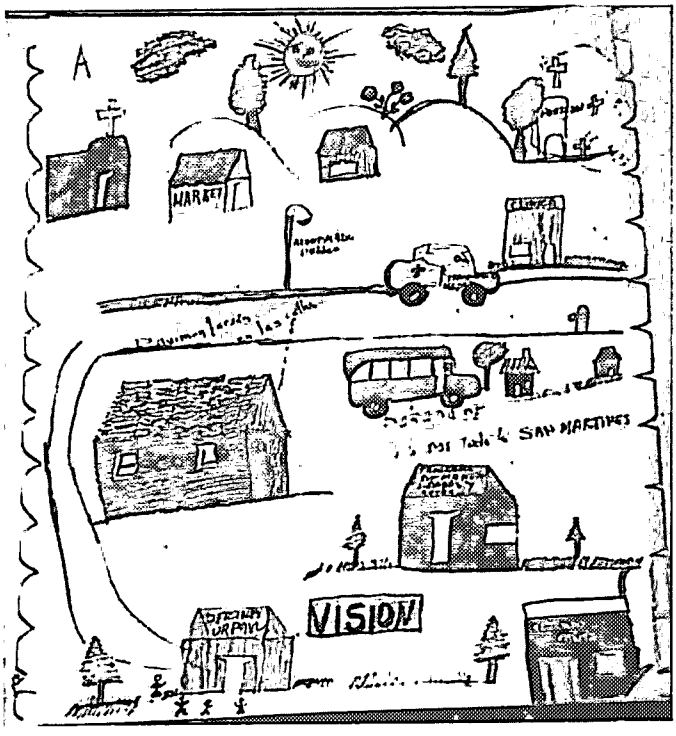

FIGURE 4. Collaborative map (A).

Taken side by side, the two maps are graphic portrayals of the dialectic of life in Val Verde. The notion of a dialectic, without attaching too much theoretical framing to the term, comes from the residents themselves, as they sought to produce two pictures, one expressing "things that needed to be fixed immediately" and the other expressing "the great things about Val Verde that others also need to know." In Map A (Figure 4), we see a picture of coherence, where everything has its place and seems to fit. These are elements of the place that all somehow fit, even the street, which is associated with health (the clinic). The hills blend into the scene, and there is circularity to the design of the drawing, as the eye moves around it in an unbroken circle. There are small people at the bottom of the page who, though tiny, seem to be playing in the sun. The map includes good aspects of the town that could already be found in it, as well as a vision of things that the group is working to attain. Thus, we find on the same map the clinic and URPAVV office (both already there), along with the church and school (both envisioned). One of the things envisioned was a cemetery, and when this was inquired about, one of the residents explained, "This is where we have lived for so long, this is where our children were born, and this is where we would like to be buried .... [T]his is our place, forever." In short, Map A is a vision or representation of Home, which is a place that people have come to associate themselves with. Literally, Home is the place that they are a part of and which is a part of them. The unbroken circle of Map A reflects the circle of relationships that extend from self to neighbor to place and then back to self. There is a wholeness to the scene, as each landmark finds a place of its own, spaced evenly and comfortably across the landscape. In this scene of balance and equilibrium, each thing has a niche, so to speak.

In contrast, the negative elements of Val Verde are depicted in Map B (Figure 5). Contrast the placid circularity of Map A with the highly angular, broken scene of Map B. In contrast to the pleasant street in the previous map, neutral in its horizontal alignment, the street here cuts diagonally through the community, invasively, bringing not health but garbage trucks. The hills are intrusive. There is no balance in the scene but, instead, a dynamic tension expressed as angularity. The scene is replete with rodents, redolence, and squalor. There are people here, too, though the figures are grotesque, sharing graphic elements (the blobs of gray) with the rodents on the upper right-hand side. In contrast to the pleasant hills at the top of the page in

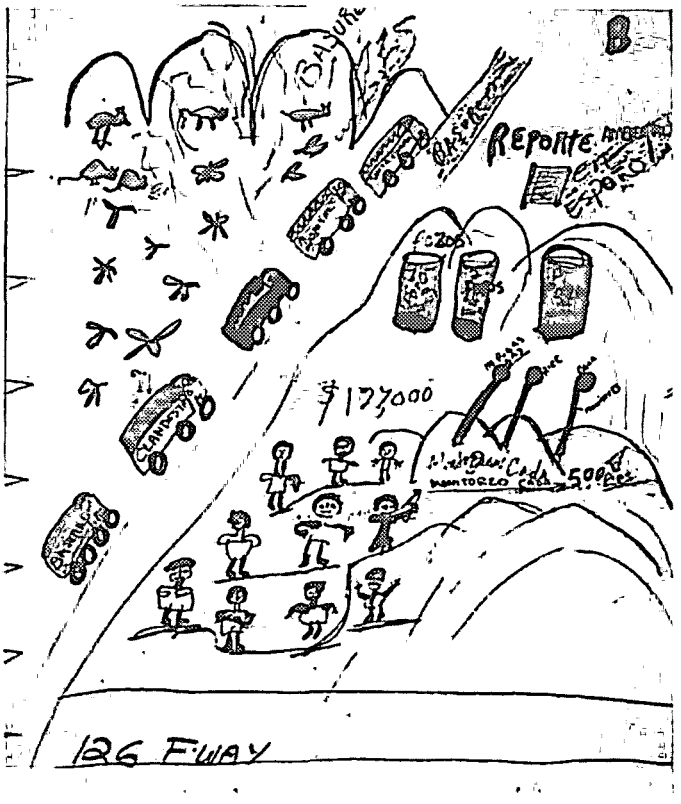

FIGURE 5. Collaborative map (B).

the positive vision map, here, the mountains are everywhere and dominate the place, intruding into everything. It is an ugly scene, and the colors portray this, in contrast to the previous map. While we find a sense of coherence and completeness in Map A, in Map B, we find a disturbing pestilence. Even elements of city infrastructure, seen in the pipes (*pozos*) in the upper right-hand quadrant of the page, are broken, draining into the community, looking like garbage cans themselves. Map B also speaks of betrayal, symbolized by the figure "$127,000," the amount of the legal settlement that should have been spent on environmental studies, and the term "*Reporte Ambiental*," a Spanish version of the term "environmental report," referring to the report that the researchers did not provide to the residents.

The members of the community and the other elements of place are all drawn in a murky gray. In fact, the only vibrant colors on the page are associated with the trash trucks — suggesting a sort of taking over of the place by these alien intruders (*clandestina*). In the scene, the grotesque people/creatures become part of the squalor. In a sense, Map B speaks to dehumanization (a notion that will appear again in the resident interviews), where the residents are, graphically, treated almost like garbage themselves. The colonization of the community by the landfill (and, more directly, by the garbage haulers) is vividly illustrated as a stream of trucks invading the space almost like a column of tanks of some conquering army. Unlike the utopian equanimity of Map A, there is a dynamic tension in Map B, where movement and agency are associated with the trucks. The element of the grotesque is deliberate in this picture. We try to take people's sense of comfort away, says one of the group's leaders. We should note that this same person has been photographed in the past dressed as a corpse during *El Dia de los Muertos* (the Day of the Dead) on November 1st, which the group uses as an occasion to protest the landfill.

It is also important to take these maps together, since that is the main intent of the residents. These maps, labeled matter of factly as Maps A and B, reflect the lived dialectic of the place. Val Verde, in fact, is both of these, but the dialectic is used to better convey the experience of the place, which cannot be captured with one simple picture. Perhaps, we can surmise, life itself is experienced here in dialectic terms. They also express the conflicted nature of life in Val Verde. The seeming equanimity of the place is broken by the abrupt reality of the landfill — yet both are part and parcel of the place.

The Gestalt of the community's lived experience is directly reflected in these artifacts, where elements of the situation are not analyzed piecemeal but, instead, are incorporated into a comprehensive picture of the entire community. What the collaborative maps are suggesting is that residents experience place as a whole, and the need to produce two maps in part represents the dialectic of life there, where the strong attractions of home and community are countered by the fear engendered by the landfill. Thus, there is a need for methodologies (such as mapping and drawings) that probe into the Gestalt of place and not just piecemeal elements (which is characteristic of the EIR).

Resident Interviews

The interviews began with talking about people's general impressions of Val Verde and life in it. A common feature of narratives about the place involved words such as placid, peaceful, tranquil, and pleasant. Some spoke of how everyone knew their neighbors and how Val Verde had become their home.

The interviews provide more insight into how the landfill, though not visible, dominates the landscape. The interviews, which were couched as a general discussion with residents about Val Verde, generally did not touch on the landfill until the residents brought it up themselves. In each of the interviews, the residents invariably mentioned the landfill early on in the discussion, which speaks to the presence of this otherwise invisible entity in their everyday lives. Part of its invasive presence manifests itself through an insidious odor that seeps into their very consciousness.

When I worked you could smell the stench ... . I would put vapor rub on my nose and when I would arrive over there I would blow my nose ... . I would clean myself so I wouldn't smell the stench right, and still I would breathe all that ... . [W]hat can I do, the air enters you, and you can feel the ammonia.

The landfill is present, they are saying, but its presence is manifested through none other than the residents' own bodies. It is, as Casey (1993) describes, the "emplacing" power of the body to establish modal location. Presence and location are mirrored in the residents' bodily experiences, whether through the incessant cough, the invasive stench, or the feeling of nausea. Further interviews with other residents speak to the same issue:

"There are gases. And the wind is the same ... . [T]he wind is what attacks a person." "Sometimes the air blows it this way and sometimes the other way, the wind is what dominates everything." "[N]ow we no longer smell those strong odors. Although sometimes it still does come at night like waves sometimes. Because the wind is like that."

In these narratives, the landfill manifests itself as the "wind," which, especially in the last quote, is likened to the inexorable, overpowering ocean. This notion of the wind that invades everything and which one cannot escape underscores the tragic element of these narratives. By tragic, we mean, most specifically, the dramatic form in which the protagonists attempt to defy what they see as their (usually unfortunate) fate, yet in the end, succumb to it anyway. The inevitability of fate also carries with it the futility of struggle, as expressed in the following:

"But ever since the landfill came, all this started but ... what can we do?" "Well, for my part I feel bad, because there are many children (who have gotten sick) and we don't have the means to cure them." "And what can we do in that case? If they are like that, like I said, they have the power ... . [O]ne feels incapable of not being able to do that."

These narratives speak to a profound helplessness. Feelings of betrayal are part and parcel of this experience, and most of the interviews recounted instances when they felt lied to. One vivid account portrayed a county official stuffing her face with lunch while scolding the community group about how they should be grateful that the landfill brought development to Val Verde. The sense of dehumanization is even more graphically portrayed in statements like the following:

But in that company lots of people work there, like more than 500 persons every day, every day, every day. [A]nd we were dragging ourselves in the dirt in the mud when it was raining, that's how they put one in to work. One doesn't escape ... . We suffered a lot in our work, and badly paid.

In the statement above, the speaker gives a metaphorical account of how community members are treated, literally, like beasts of burden. In a sense, this echoes images in the collaborative mapping that portray residents as creature-like figures in a thoroughly grotesque representation (Map B). Location, environmental insult, and injustice are all played out in and through the person's body. The most moving and painfully tragic account of helplessness was recounted by one longtime resident who spoke about one fateful day, years ago:

My granddaughter. She died at a year and a half. And well, poor thing she already talked, very funny and affectionate, and she loved us very much. And well, that day I remember that a woman passed by,

it was right in the middle of the day, the sun was out ... . And since the house has like [inaudible], the little girl stopped there in front, and in that little while a strong wind comes. And like I said, I grabbed the little girl and I reclined her in my stomach, and I told her, "Child let's go inside because this wind is too strong." And it smelled bad. So then we went inside. Well in a few days the little girl started being sick ... . Yes my granddaughter. And she couldn't save herself.

The last part of the quote ("she couldn't save herself") captures, in the deepest way, the tragic narrative that was common to many of the interviews.

Again, we observe that these narratives exhibit a dialectic of sorts, mirroring that of Maps A and B mentioned in the previous section. One must keep in mind that, despite the years of frustration and felt betrayal, the members of URPAVV had a resolve to stay in Val Verde even if they had the means to leave. As one resident put it:

One of the good things about Val Verde is that my children live in peace. I have some neighbors that have really helped me out when we had problems.

Do the residents employ images or concepts that resemble the policy model of *risk*? One common way that the landfill was spoken of was as a "contamination" ("*contaminación*") and, in fact, a ubiquitous kind of contamination: "It doesn't stop being a problem .... [T]he wind is what dominates everything," and "The wind, the water, is what moves the filth." They also spoke of the landfill as a source of "infection." To a lesser degree, some also associated the landfill with a constant noise.

This contrasts with the classic notion of *risk*, which posits a probability of injury. Instead, for Val Verde residents, the landfill is a constant — it shows up in cognitive maps drawn of the place, and it maintains a constant presence in the daily lives of the residents. The effects of the landfill are not probabilistic — they are always there, manifested in residents' everyday health and in the very way they are treated. Associating the landfill with the wind, it is what "dominates everything." This brings us to the second common way that residents spoke of the landfill, which is in terms of prejudice ("*prejuicio*" or, more commonly, the verb "*prejudicar*," to injure). That is, residents associated the landfill with the way they felt they were treated by authorities, the landfill operator, and others: "Every day, when we go out for a walk, we encounter the odor from the landfill that is injuring the area."

The landfill is also associated with a nagging fear on the part of the residents, some of whom "feel a desperation, they are scared and, when they have that (panic attacks), they feel alone, sometimes, their whole brain hurts" — again, registering the landfill not in terms of the probability of a future consequence, but in terms of presence. Only two residents, in fact, ever used the word "*riesgo*" ("*risk*") in the interviews.

Another way that the residents' experience diverges from the rationalistic policy model of *risk* is that, while the latter depends on the spatial location of the landfill in relation to the community, the presence of the landfill does not register in these spatial-locational terms. Rather, the landfill, like the wind, surrounds the residents and dominates everything. It is akin to a global locality that the phenomenological concept of primal depth produces, as the wind and by extension the landfill are, in a sense, everywhere at all times (Merleau-Ponty, 1964; Whitehead, 1953). Rather, the landfill's presence registers along the here-there dimension (Casey, 1993; Lakoff and Johnson, 1980), where, whether due to nature ("the wind") or intentionality ("going out for a walk"), the landfill invades the here. These notions are, in turn, related to transactional models of person-place interactions, which view places in terms of their social, physical, or locational affordances, rather than simply in terms of their mere location (Saegert and Winkel, 1990; Stokols, 1981).

Lastly, the classic notion of *risk* involves translating the hazard to a measure that one then weighs or values according to some cardinal scale. This is missing from the residents' narratives. When asked whether they would consider receiving monetary compensation to make up for the effect of the landfill or to allow them to move out of Val Verde, only one resident said they would consider compensation. The landfill needed to be closed because "it is just not right." As one resident said, "No, well even if they increase the amount [of

compensation], that does not help me at all." Phrases like "it is not right" convey a moral mode of reasoning, not a utilitarian one (Forrester, 1982).

CONCLUSION: POLICY LINKAGES

We began with a note about how policy is dominated by a reductionistic, probability-based model of environmental *risk*. This leads to policy responses that are fairly limited as a result, such as reducing the conversation to technological measures to decrease expert-measured estimates of *risk* below regulatory thresholds. In contrast, the experience of life near the landfill is multidimensional and inherently more complex than the classic model. As shown in the sketches and narratives, the landfill is registered not as a positivist measure of hazard but in terms of presence and effects that manifest daily in the residents' own bodies. The issue of the landfill is understood in terms that are not primarily technological, but are, rather, relational (*i.e.*, the landfill is viewed through its presence as a bad neighbor and the unjust manner in which residents feel they have been treated). The technological measures employed by the agencies and the landfill operator do nothing to address the moral dimension in which residents regard the landfill. Environmental policy analyses should focus on the modes by which residents understand the landfill, instead of on only the narrow, classic (probabilistic) measure of *risk*. As a research objective, we need to better describe such phenomena in relational terms (Lejano, 2008).

The contrast in the ways *risk* is analyzed by the agency and the community underlies the sense of injustice felt by the latter. The community members' experiences are ignored by the agency analysis. Whereas the objective measures employed in the EIR all suggest no *risks*, community members report a host of impacts ranging from direct health effects (*e.g.*, headaches, nausea) to equally important experiences of anxiety. Recent epidemiological evidence linking stress to traditional health outcomes like cardiovascular disease and immunodeficiency only underscores the gravity of these subjective experiences. In short, classic risk analysis does not adequately represent the lived experience of *risk*.

The sense of alienation is compounded by exclusion from the agency process. The following were among the problems cited by the URPAVV members:

- non-availability of EIRs and other documents in Spanish,
- the fact that, for whatever reason, URPAVV did not receive a number of air-quality and water-quality monitoring reports, and
- the lack of consultation with local residents.

But perhaps the most fundamental source of alienation among community members can be traced to the agency's official statement of findings "that the remaining unavoidable environmental effects of the project have been reduced to the extent possible and to an acceptable level and are outweighed by specific, social, economic and environmental benefits of the project" (County of Los Angeles, 1997:1). Essentially, their ultimate finding is that problems faced by the residents of Val Verde are outweighed by the greater good.

The last point raises the question of whether or not agency analyses can include residents' viewpoints and their subjective experiences. Should agency analysts employ methods like interviews, focus groups, and surveys?

Our foremost conviction is that such phenomenological considerations have important implications for policy. In the case of Val Verde, analyses such as those conducted by the agencies should consider the multiple ways that the landfill impacts life around it, instead of just concentrating on the measurable toxic, volatile chemicals that are emitted from the landfill. The analysis should consider ways that residents are treated in agency forums. As Map B of the collaborative-mapping session indicates, the way that all agency proceedings regarding the landfill have been crammed into one large, technical report is a betrayal of the community. Rather, assessments of environmental quality should consider the residents' feelings. In fact, as our research has endeavored to show, environmental policy analyses should include the residents' own narratives, expressed in their own words. These narratives should be a part of reports, discussions, and agency hearings. Similarly, there is as much need to show sketches (Maps A and B) from the collaborative-

mapping sessions in agency planning documents as the expert-produced topographic and other maps. If indeed there are differing cultural systems for understanding an issue such as *risk*, then there is a need to validate these different systems through policy (*e.g.*, see Brenot, *et al.*, 1998; Rayner, 1992).

In terms of policy responses, there is a need to address how alien the landfill and the trash trucks appear to the community. The dominance of Chiquita Canyon Road, which brings many of these trucks to the landfill, looms large in the everyday experience (and sketches) of the residents. Environmental remediation measures should include the phaseout of the landfill. In the near term, these measures should include strategies for reducing the negative impact of the truck route on the community, such as rerouting truck traffic, utilizing less polluting (low-emission) trucks, or considering changes in hours of operation. The ubiquitous nature of malodor from the landfill is an important consideration that does not appear in expert risk assessments (which mainly consider toxic air emissions of volatile carcinogens). Most importantly, the squalor of the landfill should be considered in relation to what residents value about the community — its tranquility and sense of wholeness, which the landfill violates. Along with mitigating effects of the landfill, agencies should consider other needs of the community, as expressed in Map A of the collaborative-mapping sessions.

The problem is not when the situation matches the agency's objective representation of *risk* so that the objective measures clearly point to significant impacts. Instead, the main question pertains to those gray areas where these objective measures suggest little impact, yet the lived experience of the residents suggests a larger impact. In these latter cases, perhaps there is a need to allow these subjective evaluations to provide guidance to decision-makers. Distances to noxious land uses might be increased to a point that these subjective impacts would no longer be felt. New methods of inquiry (*e.g.*, focus groups) might be put to use in these gray areas. The mere acknowledgment of these subjective experiences and documentation in official reports and EIRs would be an important policy reform.

So, the first recommendation is for formal agency procedures to more explicitly incorporate nonobjective aspects of community experience. This leads directly to a suggestion to utilize nontraditional instruments for analysis. In this research, we have demonstrated how some of these instruments, which have been extant for a long time, could be put to novel use in environmental impact assessment. This requires that we acknowledge these instruments are as rigorous and formalizable as those used in the physical sciences (such as traditional risk analysis). This is in keeping with a realization that complex phenomena, such as community *risk*, require an openness to multiple ways of knowing (see Schneider and Ingram, 2007) and transdisciplinarity (Stokols, 2006).

The risk-perception literature shares our fundamental premise that perceived *risk* deviates systematically from measured *risk* (*e.g.*, Fischhoff, *et al.*, 1978). However, we are trying to say something altogether different. Unlike the risk-perception literature, which represents perceived *risk* in the classic form of probabilities, we look at the different qualitative ways that residents understand *risk*. Part of this is to understand *risk* not merely as a measure but as a feature of the Gestalt of place — this is the reason why we elicit sketches and interviews from the residents instead of probabilities. The gap between perceived and measured *risk* that we are concerned with is not merely a matter of degree; it is fundamentally different in nature. We also depart from the risk-perception literature in attempting to view community representations of *risk*, as opposed to the classic analytic focus on individual perception of *risk*, which is why community vision maps are so important to us. The use of cognitive maps and community visioning to capture the lived experience of *risk* is, in fact, a fundamental addition to the literature. Thus, we propose the formal inclusion of analytic instruments such as those used in this research in agency environmental impact assessment processes. If the maps and sketches provide a glimpse of what really matters to community members, then this material should be directly relevant to community and agency decision-making practices.

Lastly, the investigation reveals how present efforts to contain the landfill's environmental impacts have done nothing to reduce these to levels that are below community members' thresholds of significance. The standards of significance that residents employ are more complex, having to do with trust, a sense of security, and a regard for home, which the continued presence of the landfill threatens. The findings from this research contradict expert analyses of the landfill, which are found in the EIR for the landfill expansion project and the quarterly environmental monitoring reports. Despite all the agencies' assurances of environ-

mental controls and a legally mandated settlement agreement, the landfill continues to disrupt the everyday life of Val Verde residents.

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ACKNOWLEDGMENTS

The authors wish to thank Jose Vega, Sr. and Elvia Vega, president and vice president of URPAVV, respectively, for their kind permission to use the community drawings (Figures 3-5 in the article). We are deeply inspired by their continuing work to better the lives of the Val Verde residents. We also thank Chikako Sassa Yamada for permission to use her photograph (Figure 2 in the article) and her exemplary thesis on Val Verde. We thank Jose Vega, Jr., Hannah Aoyagi, Toby Warden, Maritza Angulo, Karolina Soriano, Elvia Salas, Gabriela Noriega, Jared Eskenazi, and Josias Gonzalez for their work on conducting the workshops and subsequent analysis. Figure 1 is used with permission from MapQuest, Inc. MapQuest and the MapQuest logo are registered trademarks of MapQuest, Inc. Map content © 2008 by MapQuest, Inc., NavTeq, and its respective copyright holders. Used with permission.

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Manuscript revisions completed 8 December 2009.