

The Social Production of Toxic Uncertainty

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Based on both archival research and two and a half years of ethnographic fieldwork in an Argentine shantytown with high levels of air, water, and ground contamination, this article examines the social production of environmental uncertainty. First, we dissect residents' perceptions of contamination, finding widespread doubts and mistakes about the polluted habitat. Second, we provide a sociologically informed account of uncertainty and the erroneous perceptions that underlie it. Along with inherent ambiguity surrounding toxic contamination, the generalized confusion about sources and effects of pollution is the result of two factors: (1) the "relational anchoring" of risk perceptions and (2) the "labor of confusion" generated by powerful outside actors. We derive two implications from this ethnographic case study: (1) Cognitive psychology and organizational sociology can travel beyond the boundaries of self-bounded communities and laboratory settings to understand and explain the collective production and reproduction of ignorance, uncertainty, and error. (2) Research on inequality and marginality in general, and in Latin America in particular, should pay close attention to the contaminated spaces where the urban poor live.

How do people perceive an environmental-ly risky situation? When do they fail to understand what is objectively a clear and present danger? How and why are (mis)perceptions shared within a community? Public understandings of health-threatening environmental contamination have been the object of much detailed research. Many studies have examined the views and sentiments of affected residents in several communities in the United States

(Brown and Mikkelsen 1990; Bullard 1990; Checker 2005; Couch and Kroll-Smith 1991; Lerner 2005; Levine 1982).¹ Although diverging in methodology, analytic depth, and empirical focus, a typical sequence can be extracted from most of these accounts: collective ignorance about the presence and impact of toxins is interrupted when a neighbor or a group of neighbors, in many cases "irate housewives turned into activists" (Mazur 1991:200), begin

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¹ For a recent review of research on and protest against "environmental racism," see Pellow 2002, 2005; for discussions on environmental inequality, see Anderton et al. 1994; Davidson and Anderton 2000; Downey 2005; Gould 1998; Krieg 1998; Mitchell, Thomas, and Cutter 1999; Weinberg 1998.

to make the connections between their place of residence and the existence of certain illnesses, between illness and toxic hazards, and between their individual problems and those of others (Kaplan 1997).

Brown and Mikkelsen (1990) coined the term “popular epidemiology” for the process through which victims “detect” a disease pattern (in their case, a leukemia cluster in Woburn, Massachusetts). This progression usually includes an active process of learning, with a great deal of frustration, in which victims quickly become skilled at playing political games with authorities and absorbing scientific knowledge (Brown 1991; Brown, Kroll-Smith, and Gunter 2000; Cable and Walsh 1991).

Despite divergent theoretical orientations, most of the available accounts share a classical Marxist model of consciousness: physically proximate aggrieved people overcome false beliefs or persistent uncertainties through reflection and interaction. The outcome of this “loss of innocence” (Cable and Walsh 1991; Levine 1982) is almost always a single and determined consensus regarding the problem and its solution. Tellingly, the main actor is most often “the community.” By emphasizing changes in collective perceptions of legitimacy and mutability of objective conditions, most of this work portrays, either implicitly or explicitly, a variation of what McAdam (1982:34) terms “cognitive liberation” (i.e., the “transformation from hopeless submission to oppressive conditions to an aroused readiness to challenge those conditions”).

Most studies of risk highlight perceptions as independent variables: beliefs about hazards are used to explain behavioral outcomes (i.e., the collective actions people organize to protect themselves) (Tierney 1999). Despite the well-documented process of discovery and mobilization, the *sources* of such perceptions (which, as Lupton [1999b:2] rightly puts it, are the “outcome of sociocultural processes”) usually remain underexplored (for an exception, see Beamish 2001; see also Heimer 1988). Moreover, in the almost exclusive focus on successful cases (i.e., cases in which communities were either relocated, compensated, or cleaned up) and in the emphasis on the ultimate achievement of a shared consensus regarding sources, effects, and solutions to contamination (i.e., communities that “discover” and establish

shared knowledge about surrounding toxicity), the extant literature remains silent about cases in which there is neither a clear outcome nor a single shared understanding. When confronted with neither increasing awareness nor cognitive liberation, but with the reproduction of ignorance, error, disagreement (when there is no single “community” to speak of), and doubts about the origins, extent, and effects of toxins, we are at an analytical and theoretical loss.

We argue in this article that organizational theory and cognitive psychology have much to offer scholars who are seeking to understand the mechanisms and processes involved in the perseverance of uncertainty and mistakes. Drawing on both archival research and a two and one-half-year-long ethnography in Flammable (the town’s real name), an Argentine shantytown with high levels of air, water, and ground contamination, we describe an instance in which risk uncertainty has been perpetuated. In so doing, we concentrate on a “negative case” of consciousness about imminent danger. Taking heed of existing sociological research on risk perception and critically translating the insights of organizational sociology and cognitive psychology for the case of Flammable, we explain the reproduction of uncertainty and confusion about pollution as the product of two processes: (1) the “relational anchoring” of risk perception and (2) the “labor of confusion” produced by socially consequential institutions. These two processes are hinted at in existing scholarship on lay-public risk assessments but remain empirically unspecified. In providing grounded empirical insight, our analyses and findings offer a clearer theoretical picture of pertinent processes. Moreover, they provide a useful analytic blueprint—a blueprint that can and should be extended to lived experiences of toxic hazards in communities throughout the Americas.

RISK PERCEPTIONS AND UNCERTAINTY

Scholarship on risk perception has significantly expanded during the past two decades (Caplan 2000; Clarke and Short 1993; Dietz, Stern, and Rycroft 1989; Lupton 1999a, 1999b; Stallings 1990; Tierney 1999) and now emphasizes the socially constructed character of the varying ways that lay persons (Beamish 2001; Heimer

1988), policymakers (Jasanoff 1986), organizations (Clarke 1989; Eden 2004; Vaughan 1990, 2004), and communities (Brown and Mikkelsen 1990; Couch and Kroll-Smith 1991; Edelstein 2003; Erikson 1976; Levine 1982) understand risk and assess hazards. Social scientific research has shown that factors such as class (Douglas 1985), gender (Flynn, Slovic, and Mertz 1994), and age (Field and Schreer 2000) shape perceptions of risk (for a review, see Mythen 2004).²

Schemata (Bourdieu 1977, 1998, 2000), cognitive structures (DiMaggio 1997), or frames (Eden 2004; Vaughan 1998, 2004) mediate between a hazardous environment and the subjective experiences of it, giving form to what people know, think they know, ignore, or (mis)interpret about surrounding dangers. A plethora of social influences shape these frames or schemata. Existing sociological research recognizes the roles of organizations (Clarke and Short 1993; Perrow 1984, 1997; Stallings 1990), institutional interests (Clarke 1989, 1990; Tierney 1999), expert systems (Beamish 2001; Proctor 1995), and the state (Freudenburg 1993; Pollak 1996) in the molding of lay public “risk frames.” People’s trust (or lack thereof) in the organizations (governments included) and experts in charge of producing information about risk, those responsible for protecting the public, and the producers of hazards are directly relevant for risk perceptions (Beamish 2001; Freudenburg 1993; Perrow 1997). Extant scholarship agrees that to understand and explain the widespread uncertainty and confusion dominating the lives of people living at risk, empirical research needs not only to delve deep, both synchronically and diachronically, into the frames actors use to perceive their surroundings, but also to find out why these frames are what

² Lupton (1999a) critically describes the main concerns and epistemological underpinnings of the three major theoretical perspectives on risk: the “cultural/symbolic” (identified mainly with Mary Douglas), the “risk society” (Ulrich Beck), and the “governmentality” (Foucault). Our analysis shows, by way of example, that we share Lupton’s general critique of these three perspectives when she writes that they “tend to operate at the level of grand theory, with little use of empirical work into the ways in which people conceptualize and experience risk as part of their everyday life” (1999b:6).

they are (Heimer 1988; Tierney 1999). As Beamish (2001:11) argues, “historical legacy” and “interpretive context” are central in giving form to perceptions of risk.

Cognitive psychologists have also contributed to our understanding and explanation of the ways in which individuals perceive risk. Through a variety of ingenious laboratory experiments, they have documented a series of heuristics that individuals rely on to simplify the selection and digestion of an overabundance of information under conditions of uncertainty (Gilovich, Griffin, and Kahneman 2002; Kahneman, Slovic, and Tversky 1982). Two of these cognitive heuristics are of particular relevance to the study of risk perceptions: availability and anchoring. *Availability* refers to individuals’ tendency to give excessive importance to information that, for reasons that are logically accidental, grabs their attention. *Anchoring* induces people to give undue weight to an initial value that in turn powerfully affects their subsequent judgments. In other words, estimations of risk are affected by the availability of information and by the reference points that frame a person’s cognitive mapping of a situation. Heimer (1988) rightly notes that sociological studies of risk perception should contextualize these inferential shortcuts by specifying what factors influence the availability of information and the sources of reference points.³

THE CASE OF ENVIRONMENTAL HAZARDS

We follow Heimer’s call for specification in two ways. First, we dissect the ways that two powerful actors (state officials and doctors) shape the availability of information about origins and effects of toxic contamination as they make striking but contradictory claims about existing hazards. Second, we examine the

³ For an illuminating application of cognitive heuristics to the study of policy diffusion, see Weyland (2005). For an illustration of the working of heuristics for the case of toxic poisoning, see Heimer’s (1988) interpretation of Clarke (1989) and Levine (1982). For a summary of the methodological problems in cognitive-scientific studies, see Mythen (2004).

anchoring device in the context of a neighborhood's history, daily routines, and interactions.

Most research on "contaminated communities" (Edelstein 2003) focuses on cases in which everyday life is abruptly dislocated by the uncovering of nearby hazards. The "disruption of the quotidian" (Snow et al. 1998) begins with initial suspicions regarding the existence of dangerous toxins in the vicinity of a residential area and their potential or actual effects on residents' health. These initial qualms are typically followed by a process of discovery through "popular epidemiology" (whereby residents detect a disease pattern and trace it back to a toxic origin) and accompanied by a shared consensus regarding the problem's sources and solutions—an emerging new frame (Brown 1991; Brown and Mikkelsen 1990; Capek 1993; Clapp 2002; Levine 1982; Murphree, Wright, and Ebaugh 1996). *Risk frames*, in this typical sequence, emerge in interactions with other aggrieved parties (some of whom quickly surface as unexpected leaders)⁴ and in confrontations with the state and other expert systems (e.g., physicians) that typically deny, cover up, or minimize the actual or potential damage (Beamish 2000, 2002; Bryson, McPhillips, and Robinson 2001; Clarke 1989; Gephart 2004; Lerner 2005; Petryna 2002; Phillimore et al. 2000).

Collective perceptions of risk have rarely been scrutinized in specific sociospatial universes such as Flammable, where daily life is dominated by ignorance, error, and doubt regarding the sources and effects of toxicity and socially consequential actors neither minimize nor deny the existing dangers.⁵ To explain

the social production of toxic uncertainty, we heed the call for a radical contextualization of the heuristic devices and frames that actors draw on to make sense of hazards (Eden 2004; Heimer 1988; Vaughan 1990, 1998, 1999, 2004). To foreshadow our argument: During the 70 years that health-threatening pollution was slowly and inexorably incubating in Flammable, neither a major industrial accident nor a sudden discovery of a disease cluster ever disrupted daily routines. This temporal dispersion of contamination resulted in what, combining insights from cognitive psychology and organizational sociology (Eden 2004; Gilovich et al. 2002; Kahneman et al. 1982; Vaughan 2004), we label *relational anchoring of risk perceptions*. We argue that uninterrupted routines and interactions worked smoothly as blinders to increasing environmental hazards.

During the long period of slowly germinating contamination, the actions of the state and the authorities with regard to pollution in the neighborhood were less consistent and more contradictory than either the denial or underestimation documented in the existing literature. The multiple, contradictory, and incongruous actions gave shape to what we term, combining insights from students of symbolic power and newsmaking (Bourdieu 1991; Molotch and Lester 1975; Thompson 1984), a *labor of confusion*, which had a decisive effect in creating shared (mis)understandings.

The existence of what we call toxic uncertainty in Flammable has interesting parallels with Vaughan's (1990, 1999, 2004) detailed

⁴ Larry Wilson in Yellow Creek, Key Jones and Kathleen Varady in Pennsylvania, Anne Anderson in Woburn, Margie Richard in Diamond, and the now legendary Lois Gibbs in Love Canal, are the best-known examples of stubborn, almost heroic, leaders of "long and bitter" struggles (Couch and Kroll-Smith 1991).

⁵ For work emphasizing ambiguities in understandings of risk and contradictions in official discourse, see Zonabend's (1993) study of risk perceptions among residents living near a nuclear reprocessing plant in Normandy, France. Ethnographic studies by Macgill (1989), on lay responses to the radioactive discharge from the Sellafield nuclear plant in the United Kingdom, and

Reilly (1999), on collective understandings of the Bovine Spongiform Encephalopathy crisis in Scotland, provide evidence regarding the variety of meanings people attach to risk in their daily lives, particularly the "depth, complexity and ambiguity" of people's "risk attitudes" (MacGill 1989:62) and the factors that shape them. Similar in analytical intent, our study differs from these two studies in the kind of specification we provide regarding the sources of collective "risk frames" and in the substantive conclusions we reach. In contrast to Macgill and Reilly, we detect neither a decreasing reliance on expert systems when it comes to assessment of risks nor an increasing reflexivity in residents' monitoring of toxic risks (for a summary of these two studies and their relationship to Beck's "risk society" approach, see Mythen [2004]).

examination of the production and normalization of a cultural belief in risk acceptability within NASA. Noting the absence of major disruptions and the gradual increment of seemingly minor problems in the space-shuttle program, she writes (1998:38):

Had all the changes occurred at once, had damage been occurring on every flight due to a common cause, or had there been a discernable pattern of damage, the work group would have had some strong, clear signals with the potential to challenge the cultural belief in risk acceptability. Instead, the damage occurred incrementally, each incident's significance muted by social context and a learning-by-doing approach that had engineers interpreting each episode as separate and local.

It was, to quote from an informant in Eden's (2004:271) penetrating analysis of the ways of thinking about fire damage in American nuclear planning since World War II, a "continuing pile-up of things." That constant "pileup" shapes the way planners incorporate (or fail to incorporate) fire effects into standard models of nuclear damage, gives form to the ways that NASA personnel think about risk, and molds the frames Flammable residents use to think and feel about their environment.

Besides the case of (mystified) experience in a highly-contaminated setting, what can we learn from the ensuing analysis? Our ethnographic case study has both substantive and analytical implications. Most notably, the wretched environment in which the urban poor live remains a marginal, if not absent, issue for students of poverty in Latin America. A recent comprehensive review of sociological studies of poverty and inequality in Latin America (Hoffman and Centeno 2003), as well as a symposium (published in the most prominent journal of Latin American studies) on the history and state of studies examining marginality and exclusion in Latin America (González de la Rocha et al. 2004), make no mention of environmental factors. With just a few notable exceptions (Farmer 2004; Schepher-Hughes 1992), ethnographic work on poverty and marginality in Latin America has failed to take into account one simple, essential fact: the poor often breathe polluted air, drink polluted water, and play on polluted grounds, with dire consequences for their current health and future capabilities. By focusing on the ways that shantytown

dwellers think and feel about their physical surroundings, we seek to explore this missing dimension in the study of poverty in Latin America.

The following case study also has analytical implications. In contemporary ethnographic work, we rarely see individuals hesitating and making mistakes—subjects usually know something that we do not; we rely on "informants" to guide our way into the "unknown." Uncertainty and ignorance have not been a dominant focus among ethnographers because, as Last (1992:393) writes, "it is hard enough to record what [subjects] do know." But our ethnography points to the importance of ignorance, uncertainty, and error and makes a case for extending cognitive psychology and organizational sociology beyond the confines of the self-bounded communities and laboratory settings in which existing analytical tools and substantive findings originated (for an insightful statement about the importance of error in understandings of social life, see Tilly 1996).

METHODS

This article is based on 20 formal in-depth interviews with residents of Flammable and, perhaps more importantly, innumerable informal conversations and direct observations carried out over a two and one-half year period of team ethnographic fieldwork, during which one of the authors lived in the neighborhood (May 2004 to October 2006).⁶ The other author conducted fieldwork during June and July 2004, July and August 2005, and July and August 2006. We conducted half of the interviews with the neighborhood's old-timers (residents who had lived in Flammable more than 25 years) and half with new arrivals. Both groups are split evenly along gender lines. We describe internal differences in more detail momentarily.

We tape-recorded, transcribed, and systematically analyzed our in-depth interviews for their content. We coded and analyzed our field notes using open and focused coding (Emerson, Fretz, and Shaw 1995). Applying the evidentiary criteria normally used for ethnographic research (Becker 1958, 1970; Katz 1982, 2001, 2002),

⁶ Debora Swistun was born and raised in the neighborhood and lived there until July 2007.



Photograph 1. Romina's house in the midst of garbage and poison, August, 2006.

Source: Javier Auyero.

we assigned higher evidentiary value to conduct we were able to observe versus behavior reported (by interviewees) to have occurred. Individual acts or patterns of conduct recounted by many observers also received higher evidentiary value versus those recounted by only one observer.

Our fieldwork was not restricted to the neighborhood. We also conducted 13 formal in-depth interviews with doctors who worked in the community health center (N = 2), teachers employed at the local school (N = 2), state officials who worked on environmental policy for the municipal, state, and federal governments (N = 4), lawyers who sued some companies in the compound on behalf of residents (N = 2), personnel who worked in the petrochemical compound (N = 2), and a scientist who conducted an epidemiological study in the neighborhood (N = 1). To examine public officials' announcements and debates about Flammable and the adjacent petrochemical compound, we also analyzed three national periodicals (*Clarín*, *La Nación*, and *Página 12*) using their respective search

engines for news coverage of Flammable, Dock Sud, and the Polo Petroquímico from 1999 to 2006.

POLLUTION AND ENVIRONMENTAL HAZARDS IN FLAMMABLE

Slums, shantytowns, and squatter settlements are, in Argentina and elsewhere, intimately associated with environmental risks and unsanitary living conditions. Their deleterious health effects have been noted repeatedly (Davis 2006; Stillwaggon 1998; United Nations Human Settlements Programme 2003). A significant proportion of the shantytown growth in Buenos Aires has taken place along the highly contaminated banks of the Riachuelo, the river that flows through the south part of the metropolitan area.⁷ A recent count by the federal

⁷ From 2001 to 2006, the population living in precarious settlements in Greater Buenos Aires almost doubled. According to a study conducted by the

ombudsman's office shows that 13 shantytowns are located on its banks (Defensoría del Pueblo de la Nación Argentina 2003). According to the Pan American Health Organization (PAHO 1990, cited in Stillwaggon 1998:110), this river receives "huge amounts of heavy metals and organic compounds owing to the discharge of industrial waste" (see also Merlinsky 2007a). Tons of toxic sludge, diluted solvents (dumped by meatpacking plants, chemical industries, tanneries, and households), cadmium, and lead are routinely tossed into the Riachuelo's dead stream.

Flammable, a shantytown sitting on the southern banks of the Riachuelo's mouth, is surrounded by one of the largest petrochemical compounds in the country (the Polo Petroquímico y Puerto Dock Sud), by a hazardous waste incinerator, and by an unmonitored landfill. Flammable's soil, air, and water streams are highly polluted with lead, chromium, benzene, and other chemicals (Defensoría del Pueblo de la Nación Argentina 2003; Dorado 2006; Programa de Acción Estratégico 2003).

In 1931, the first Shell Oil refinery opened in what was to become the compound or "polo." The Shell refinery is the most important plant there, but the compound also houses another oil refinery (DAPSA), three plants that store oil and its derivatives (Petrobras, Repsol-YPF, and Petrolera Cono Sur), several plants that store chemical products (including TAGSA, Antívari, Dow Química, and Solvay Indupa), one plant that manufactures chemical products (Meranol), one dock for containers (Exolgan), and one thermo-electrical plant (Central Dock Sud) (Dorado 2006).

According to the latest available figures, Flammable had 679 households in 2000. The population is fairly new, with 75 percent of the residents having lived in the area less than 15 years. Moreover, although no exact count exists, municipal authorities, community leaders, and people who live or work in the area (in the petrochemical compound, the school, and health center) told us that in the past decade, the pop-

ulation increased at least fourfold. This growth was fed by shantytown removals in the city of Buenos Aires and by immigration from other provinces and nearby countries (Perú, Bolivia, and Paraguay). Internal differences separate a small sector composed of old-time, lower-middle-class residents from the majority of newer, low-income dwellers. These internal class differences are crucial for understanding the reproduction of mistakes and confusion about the surrounding contamination.

Flammable, like many other poverty enclaves in urban Argentina, was deeply affected by the explosive growth of unemployment in the 1990s (Auyero 1999, 2001). Scavenging, state welfare programs, and part-time manual jobs with one of the companies in the compound offer the main sources of subsistence in the neighborhood. What distinguishes this shantytown from others, however, is the particular relationship it has with the compound's main company, Shell-Capsa, and the extent of the contamination that affects the area and its residents.

The brick walls and guarded gates that separate the compound betray the organic connection that Shell-Capsa has had with the community for more than 70 years. In the life stories we collected, older residents remember an abundance of work in the area. They also recall the lack of housing close to the compound and their strenuous efforts to build what were initially shacks in the middle of swamps (lowlands still exist in the center of the neighborhood). In old-timers' narratives, filling in the swampland appears as a very important joint activity of the early days—and it still is, according to our interviews and observations. One possible source of contamination, however, is the very material that people in the neighborhood have used (and still use) to level their plots—the material is often packed with toxic waste. In fact, many of the life histories suggest that filling plots with garbage was a common strategy in the neighborhood. As Marta, who has lived in Flammable for 25 years, said, referring to the plot on which her house currently stands: "This was a lagoon. We filled it with all sorts of stuff, cement, stones, that black thing. . . . We paid 5 pesos per truck."

Several elements of material and symbolic entanglement exist between the neighborhood and Shell, or *la empresa*, as residents call it. Historically, Shell provided formal and informal

geographers at the Universidad de General Sarmiento (*La Nación* 2006), the population of slums, shantytowns, and squatter settlements went from 638,657 residents in 385 precarious settlements in 2001 to an estimated 1,144,500 residents in 1,000 precarious settlements in 2006.



Photograph 2. The walled petrochemical compound as seen from Flammable, June, 2004.

Source: Javier Auyero.

jobs for men (who worked in the refinery) and women (who did domestic work such as cleaning and babysitting for the professional workforce within the compound). Old-timers remember not only working for Shell, but also attending the health center located on the company's premises, obtaining drinkable water from the company, and receiving pipes and other building material from the company. A decade ago, Shell funded the construction of the health center in the neighborhood. The center employs seven doctors and two nurses and has a 24-hour guard and an ambulance, something quite uncommon in poor neighborhoods throughout the country.

Although Shell is no longer the main employer in the community (because many of its operations have been automated), it still provides jobs to residents, young and old. Furthermore, Shell routinely grants funds for the local school in what a company engineer we interviewed defined as a "social performance plan." Shell also funds many other services, including a

nutritional program for poor mothers that includes the distribution of food; computing classes for local students (held inside the Shell compound); windows, paint, and heaters for the school building; the end-of-the-year trip for graduating classes of the local school; T-shirts with the Shell logo for student soccer, volleyball, and handball teams; and toys for the school kids during the celebration of Children's Day. Through its community relations division, the company seeks to follow what a former municipal official called a "good neighbor policy." Shell's presence undoubtedly distinguishes Flammable from other poor communities.

While Shell and some other companies in the compound have created community relations programs in Flammable that do not exist in other poor neighborhoods, their industrial processes have also produced more environmental hazards than those experienced in other Argentine shantytowns. Flammable is different from other destitute neighborhoods throughout Buenos Aires in the extent (and known



Photograph 3. Romina's children playing on contaminated grounds, August, 2006.

Source: Javier Auyero.

effects) of its air, water, and soil pollution. Experts from both the local government and Shell agree that, given the air quality associated with the compound's industrial activities, the area is unsuitable for human residence, especially because it has been used as a dumping ground by many nearby companies. It is still used as an open-air waste disposal site by subcontractors who illegally dump garbage in the area (we witnessed several occasions of this during our fieldwork). Many of the pipes that connect homes to the city water supply are plastic. Defects in the joints and breaks allow toxins in the soil to enter the stream of the officially defined "potable water." A nauseating stench often comes from these garbage disposal sites, from putrid water filled with this same garbage, and from the chemicals stored and processed in the compound.

One epidemiological study compared a sample of children ages 7 to 11 living in Flammable with a control population living in another poor neighborhood with similar socioeconomic char-

acteristics but lower levels of exposure to industrial activities (PAE 2003). In both neighborhoods, the study found, children are exposed to chromium and benzene (both known carcinogens) and to toluene. But lead, "the mother of all industrial poisons . . . the paradigmatic toxin [linking] industrial and environmental disease" (Markowitz and Rosner 2002:137), distinguishes the children of Flammable from the others. In Flammable, 50 percent of the tested children had higher than normal blood levels of lead, compared with 17 percent in the control population.⁸ Not surprisingly, given what we know about the effects of lead in children, the

⁸ Currently, 10 µg/dl (micrograms per deciliter) is considered a normal blood level of lead. On the history of lead epidemiology, see Berney (2000) and Widener (2000). On the history of "deceit and denial" concerning the pernicious effects of lead, see Markowitz and Rosner (2002) (see also Warren 2000).

study found lower than average IQs among the Flammable children and a higher percentage of neurobehavioral problems.⁹ The study also found strong statistical associations between frequent headaches and neurological symptoms, learning problems, and hyperactivity in school. The Flammable children reported more dermatological problems (eye irritation, skin infections, eruptions, and allergies), respiratory problems (coughs and bronchospasms), neurological problems (hyperactivity), and sore throats and headaches.

RESULTS

TOXIC UNCERTAINTY

With the black and white smoke pouring from the surrounding smokestacks, the constant noise of alarms and heavy trucks, the random odors of gas and other pungent substances, and the surrounding garbage and dirt swamplands, it is hard for anybody in Flammable to deny that, as many a neighbor told us, “there is something here.” As we were repeatedly told (and experienced ourselves): “Sometimes you can’t be outside, the odor stinks, your throat stings. It smells of gas. Even if we close our doors, it smells.” And yet, when residents have to talk about the specifics of contamination, when they have to put a name to the sources, location, and contents of pollution, things get murky. Doubts and mistakes abound when neighbors speculate out loud about the deleterious health effects of pollution.

Flammable residents talk extensively about their environment. In analyzing our interviews and informal conversations, we found four types of errors or sources of what we call “toxic uncertainty”:

1. Misinformation—as when residents assume that lead contamination is clustered in the poorest section of the shantytown or when they assert that “lead is produced by the coal processing plant.”
2. Shifted responsibility—as when respondents argue that poor parenting is responsible for high levels of lead contamination.
3. Denial—as when residents actually challenge existing data that shows environmental pollution has reached toxic levels or when they use their own healthy bodies to deny serious contamination.
4. Blindness—as when neighbors ignore their own risk-perpetuating, land-filling practices.

Residents say that oil contaminates water streams, but they also deem it harmless. Many residents say the real problem is not the oil refinery but the nearby storage of chemical substances. Residents believe that the Shell refinery is completely safe (“it is the safest plant in the world”); they also think it is highly contaminating (“Shell is killing us,” “they give presents to cover contamination”). Similarly, they think the coal processing plant located inside the compound is poisonous (“a cancer factory,” “that is where all the lead is coming from”) or innocuous (“because nothing is vented into the air”).

With lead, however, the discrepancies take a different form. Nobody denies that lead is harmful, but most respondents displace it elsewhere. It is not located in the neighborhood but in the poorest and newest part of the shantytown. It is not stored in their (or their children’s) bodies but in those of the most destitute shantydwellers whose “kids play barefoot,” who “do not wash their hands,” and who “bathe in dirty waters.” Rather than the environment itself, permissive mothers are, to this way of reasoning, responsible for exposing children to lead. As Susana, who has lived in the neighborhood 10 years, told us: “It’s their mothers’ fault. They allow those kids to play in the garbage; they don’t bathe them . . . that’s why they get contaminated.”

Martinez (in his 70s and a resident of Flammable for the past 50 years) and Marisa (in her 60s, born and raised in the neighborhood) expressed common doubts about the extent and sources of contamination:¹⁰

⁹ Lead accumulates in the human body (in blood, tissues, and bones) in proportion to the amount of lead found in the environment. Lead in the environment results from the use of lead in industry. Lead absorption (measured in feces, urine, blood, and other tissues) is an indication of exposure and poisoning (Berney 2000). Lead may cause a range of health effects, from behavioral problems and learning disabilities, to seizures and death. Extremely high exposures to lead “cause encephalopathy and death, lower doses cause severe retardation, and lesser doses lead to school problems, small but significant shifts in IQ, and other measures of central nervous system function” (Berney 2000:239).

¹⁰ Most names and some identifying biographical details have been changed to ensure anonymity.

Martinez: I don't know, I don't know what contamination people are talking about. They blame the coal [coke] plant, but the whole [industrial] process is a closed circuit, nothing is vented into the air. Years ago, the coal was all processed in the open. . . . Not even a single coal worker is alive, *that* was unhealthy (original emphasis). . . . Not now. Listen, I worked there [at Shell] for 38 years. . . . They used to make gasoline with lead, but not anymore. I worked at the gasoline tanks, and I never got sick. . . . If this were contaminated, imagine; she (referring to his wife, Norma) has been here since 1944, and I have lived here since 1950, but we had no illness from the contamination (*no tuvimos ninguna enfermedad de la contaminación*).

Marisa: The lead-poisoned kids are all from there [the newest and most destitute part of the shantytown]. None of the kids from here have anything. . . . They [the children] get sick because of all the garbage that they themselves collect.

Still, it is a matter of common knowledge among neighbors that there is "something" in, mostly, the air. There is less certainty or awareness about ground and water pollution. What people know (or say they know) is one thing, but how people interpret this information is another (Eden 2004; Vaughan 1990, 1998). One way of thinking and living pollution acknowledges its existence but denies its seriousness. Many adults in Flammable use their own bodies as instruments of denial. After all, they "never had any health problems." As old-time neighbor Francisco put it: "I raised three kids here. I myself have been inside many of the plants, and I don't have any [health] problems." Other residents, however, are less certain about what they can learn from their bodies, or as many residents told us: "I don't really know if I am polluted or not. . . . I don't even know what the symptoms are." "So, you don't really know if you have something," said Rosita, who has lived in the neighborhood for 30 years.

Confusion sometimes comes together with denial. As Romina, who has lived in the neighborhood since 1990, said:

The water here is good. Well, that's what we say. We feel it's normal, but it'd be good to have it tested. It's not the same water you drink elsewhere, it's kind of strange . . . and they say the soil is contaminated. But my kids were playing with lentils, and they threw them there, and a plant grew. So, it cannot be contaminated.

Many neighbors believe Flammable might be contaminated, but that "we are not" or "we don't

yet know" because "we have not so far been tested"—as if the effects of environmental pollution are a black and white proposition, something one has or does not have.

Some people acknowledge the extent and severity of pollution, but, like Marisa (quoted earlier), they also point to the victims' own behavior as the true source of the contamination. Marga is the president of the local improvement association. Her comments illustrate the generalized uncertainty. Like many others, Marga thinks "contamination is terrible." She said, "If you were to think about it and start mulling over it, you'd want to leave this place right away." She thinks of the compound as "a world apart." As she sees it, "most of the time you have no idea what's going on inside" (like every person with whom we talked, she does not even know how many plants are located within the compound). Marga is convinced that the small farms that once abounded in the neighborhood disappeared because of all the industrial waste: "The soil was all contaminated; it stopped being useful." However, when speaking about the present, she expressed doubts about the sources and symptoms of lead contamination: "We should not put all the blame on those at the top [i.e., in the government or the compound]. Parents are also responsible because they never cared to attend to their children and to see what could be done." "I don't really know if I'm contaminated," she said. "Who knows what the symptoms are?"

How are we to understand and explain this complex combination of error, blindness, denial, and confusion? Why, in the midst of a slow-motion toxic disaster, where children have record levels of lead in their bloodstreams, where the air and water residents breathe and drink is highly contaminated, do Flammable dwellers allow themselves to doubt (or worse, deny) the "hard facts" of industrial pollution? Two repetitive elements show that there is nothing inherent in the powerlessness of poor communities that in and of itself can explain the widespread toxic uncertainty: (1) Some of the most confused or mistaken residents are found among the least poor residents of Flammable (those living in the oldest part of the neighborhood). (2) Nearby contaminated communities, which are as powerless and as poverty-stricken as Flammable, have gone through a process of increasing critical awareness (through a ver-

sion of “popular epidemiology”), which evolved into massive protests against toxic assaults (for a recent example of collective action in response to the discovery of a leukemia cluster in a nearby poor neighborhood, see Merlinsky 2007b). In other words, although material and symbolic destitution and vulnerability are indeed general features of Flammable, they do not explain the generalized uncertainty about surrounding contamination. In the following discussion, we argue that the twofold answer to the preceding questions lies in the relational anchoring of risk perceptions and in the labor of confusion performed by powerful actors.

RELATIONAL ANCHORING

Environmental degradation (i.e., increasing pollution of the air, water, and soil) was not suddenly imposed on Flammable residents. Unlike other “contaminated communities” (Edelstein 2003) that witness the sudden installation of a landfill, an incinerator, or a toxic industry in their proximity, or whose members discover toxic assault through “popular epidemiology” (Brown 1991), contamination in Flammable has been incubating very slowly—for as long as both the compound and the neighborhood have existed. The Shell refinery, for example, opened 75 years ago. Nicanor, one of the oldest residents, told us that his family used to live in what are now compound premises and were ordered one day to vacate.¹¹ Other chemical companies have been inside the compound for at least 50 years. This temporal dispersion of pollution is reflected in old-timers’ narratives. Nobody points to a moment in history when pollution and environmental degradation began. From a past filled with small farms and gardens, with fruits and vegetables that “smelled delicious,” in which residents spent the weekends at the nearby beach (“one of the most beautiful beaches in the entire country”), accounts move to a dirty present without any transformative events. One day they stopped going to the beach; another day they realized the last farmer was gone.

¹¹ African American residents in Diamond, Louisiana tell similar stories about original inhabitants’ forced relocation by Shell (Lerner 2005).

Gustavo has lived in Flammable more than 40 years. His recollections of his first days in the neighborhood illustrate all the things that have disappeared: “There were small farms; [they were] beautiful. I enjoyed working on my small plot a lot. I had lots of fruit there. . . . It was full of birds, thrushes, caracaras, storks. . . . In my plot, I planted onions, melons, pumpkins.” Gustavo’s memory of the early days is similar to that of many old-timers:

I came here for three months and I’m still here. . . . I became fond of this place (*me encariñé con el lugar*). Things began to work out; I made more friends here. The kids began school. I had my little farm and I got a job. Thank God I always had a job. And then . . . this was a small neighborhood . . . we all knew each other; we were like a family. We used to take care of each other. It was beautiful.

The gradual incubation of industrial pollution (in which farms slowly disappeared, streams got darker and dirtier, and the soil became filled with toxic garbage and debris) was lived mainly as a period of attachment, of taking roots in the neighborhood through work, family, and friendship networks.¹² As old-timers recollect: “There was this smell of flowers, fruits, wine, pears . . . it was a spectacle. But everything is lost, there’s nothing now.” “The farms had peppers; (they were) this big! And the tomatoes were huge. What a perfume! There were pears, plums, grapes.”¹³

As residents’ surroundings were slowly changing for the worse, they were building families, enjoying their friends, and working, “always working.” As the air, water, and soil got filthier, Gustavo and his neighbors were busy

¹² On the “incubation” of hazards, see Turner (1978).

¹³ It is quite probable that residents’ memories are somewhat idealized, as Erikson (1976:203) puts it, “partly because it is natural for people to exaggerate the standard against which they measure their present distress, and partly because the past always seems to take on a more golden glow as it recedes in the distance.” We should take into account this usual idealization. We should also note that, paraphrasing Erikson, one way to convey a current uneasiness is to contrast it with a time and place that never existed in quite the form it is remembered, but the need to do this strongly indicates the depth of one’s present discomfort.

living their lives. As simple as it sounds, the process through which Gustavo and most of the old-timers in Flammable passed is crucial to understanding how they think and feel about this (contaminated) place—not as an outsider might, but as a group thoroughly embedded in history and the routine organization of daily life (Bourdieu 1998, 2000). The cognitive heuristics people use to select and digest information about their environment—and thus their perceptions of hazards—are relationally anchored in everyday routines.

A *routine* is “a regular course of procedure; a more or less mechanical or unvarying performance of certain acts or duties” (*English Oxford Dictionary*). Familiar routines (e.g., going to work, sending kids to school, preparing meals, putting babies to sleep) have an ordering effect. They orient and stimulate action and have a comforting, almost soothing effect. We can count on routines, and the interactions they involve, to help us navigate difficult, uncertain moments. We find security in what is familiar to us, in what we can get a hold on. Routines help us screen out, or at least suspend the thought of, the unpleasant (Heimer 2001). Because routines provide us with a known route, with an “objective universe of incitements and indications” (Bourdieu 2000:222), they ground our existence. This latter aspect of routines’ cultural work is quite relevant to understanding residents’ experiences of contamination. In many of the life stories, in-depth interviews, and informal conversations we had with the residents, it was quite clear they had been occupied with the same tasks that engaged other recent migrants to the city (e.g., finding work, building a home, forming a family). As Elsa put it: “I have lived here since 1955. I grew up here. I got my education here, got married here, had my children here. The people who live here . . . we were born here, our folks died here and they left us here.”

As Flammable residents constructed their lives and relationships, their land, water, and soil were, little by little, being filled with pollutants. Yet because the process of contamination was slow and gradual, their daily routines were never disrupted. No major accidents occurred, and no generalized diseases that could be traced to activities in the compound were discovered (e.g., cases of leukemia or other types of cancers that have incited people to act in other

parts of the world). Because continuity was never threatened (if anything, residents were, as Gustavo said, “making progress,” or as Rosa put it, “living our lives”), routines (“working, always working”) and relations (“we were all friends”) rooted residents in Flammable and simultaneously obscured the growing toxic hazards.¹⁴ In other words, the lack of major disturbances contributed to the smooth operation of routines in what they do best: work as horses’ blinders. The lack of disruption in their routines enhanced residents’ focus on the tasks at hand (building homes, getting a job, putting children through school) and restricted their vision of the dangers shaping up outside the immediate environment of their homes.

Residents did not abruptly “discover” that their neighborhood was polluted. No alarm suddenly went off, no warning was signaled, no “tipping point” was reached “when impressions of what was normal quickly changed” (Beamish 2000:481). Lead, benzene, toluene, and all sorts of chemicals gradually accumulated in the ground, streams, and bodies. Through this gradual process, Flammable residents’ schemes of perception became, much like those of scientists and other professionals within highly specialized organizations, embodied history. Their collective frames are “the active presence of the whole past of which [they are] the product” (Bourdieu 1977:56).

THE LABOR OF CONFUSION AND STATE (MIS)INTERVENTIONS

Classic and current scholarship (Eden 2004; Erikson 1976; Heimer 1988; Petryna 2002; Vaughan 2004) shows that confusion and ignorance (about surrounding threats or risks) do not stem from individuals but are generated in the context in which actors live and work (see Mythen 2004 and Lupton 1999a). In Flammable, this context—filled with a multiplicity of incongruous and puzzling interventions—slowly but steadily changed over the past 70 years. This section examines the (mis)interventions of state officials and the (mis)understandings of doctors who serve the local population. It also briefly describes the

¹⁴ On the containment of risk through the performance of everyday activities, see Skinner (2000).

influence exerted by two other actors: Shell and the media. Together they affect neighbors' (mis)representations of their toxic surroundings.

The layout of the installations (e.g., tanks and pipes) within the petrochemical compound illustrates the almost complete lack of state regulation of industrial facilities in Argentina. As the current undersecretary of environmental policy of Buenos Aires told us while we were touring the compound's premises: "See the distribution of tanks, gas tanks close to chemical tanks, pipes crisscrossing the area. . . . It's basically the same thing that happened with urban space at large: it's all completely unregulated."

Companies inside the compound have basically been left to monitor their own installations. As late as March 2004, the secretary of production and environmental policy of Avellaneda publicly admitted that her office does not directly control the plants inside the compound but relies on their reports of their own operations (see also a report published in *La Nación*, March 30, 2004). If neither the federal nor the provincial or municipal governments have been able or willing to control activities within the compound, they certainly were unlikely to monitor what went on in the adjacent land, which was (and still is) used by plants and individual contractors as a free and unregulated dumping site.

Overall, state actors have manifested no concerns about pollution as a by-product of activities within the compound or with the effects of environmental degradation for the people of Flammable. As far as we were able to reconstruct, drawing on oral histories, published documents on the history of Avellaneda, and newspaper reports, the pernicious health effects of industrial pollutants were not even a public issue until fairly recently in Argentina. This absence is consistent with the denial documented in the literature (Beamish 2001; Freudenburg 1993; Levine 1982).

Things began to change when a progressive administration took charge of the municipal government in 1999, and notably when an "unexperienced" official (i.e., new to politics and to the things one can publicly say and do) became the local secretary of the environment. With an academic background in environmental sciences, this neophyte politician slowly began to put the issue of, in his words, "envi-

ronmental risk and vulnerability" onto the public agenda—and consequently into the collective consciousness of Flammable residents. In December 2000, at the initiative of the municipal government, an agreement was reached between the national administration, the government of the province of Buenos Aires, the government of the city of Buenos Aires, and the municipality of Avellaneda to monitor the air quality in the area surrounding the petrochemical compound. The Japanese International Cooperation Agency (JICA) would fund the study. After much wrangling between the parties involved, JICA provided further funds for an epidemiological study that eventually uncovered the lead contamination.

Both the "air" study and the epidemiological investigation generated intense community activity in Avellaneda and in Flammable. The local municipality organized meetings to explain the details of both studies and to solicit the cooperation of the local population. Notably, they also created a committee for environmental control, which lasted about a year and a half and included representatives from local and provincial governments, community associations, and compound plants.

While these studies were being conducted and community meetings were proliferating, several local schools in Dock Sud (the borough within the district of Avellaneda where Flammable is located) had to be evacuated because of reported "toxic leaks," presumably coming from the nearby compound. These episodes, together with the massive publicity received by the "Japanese study" (as many neighbors still call it) and public speeches by the mayor of Avellaneda and the secretary of the environment calling for better controls of compound activities and emissions (see, e.g., *La Prensa* 2001), had a stirring effect on the local population. In November 2001, approximately 200 Dock Sud residents, including some from Flammable, created a roadblock to the entrance of the compound, effectively stopping hundreds of trucks for a few hours. One protester summarized the neighbors' claims: "We are always suffering the consequences of toxic leaks and nobody does anything. They come, they take a look, they listen to us, and they leave" (*Diario Popular* 2001a).

This protest generated a revealing polemic among government officials. Laborde, the

mayor of Avellaneda, accused the government of Buenos Aires of “protecting and defending the private firms of the compound, when it should be protecting the health of the neighbors of Dock Sud” (*Diario Popular* 2001b). Mayor Laborde demanded he be given the power and the resources to control the compound activities. Buenos Aires government officials swiftly replied that “the municipality already has jurisdiction over the compound . . . this polemic makes no sense.” The mayor, in turn, said, “On the one hand there are the companies that contaminate and on the other the government of Buenos Aires that is not controlling them as it should.” This public debate among officials illustrates the way in which the problem of industrial pollution (and its real-life consequences) is often treated by a state: as a problem whose solution is always someone else’s responsibility. This attitude can be seen in a reproach made by a state official to the active secretary of the environment when the latter publicized the results of the JICA report: “Since you [the official who broadcast the JICA report to the national media] created the problem, you have to solve it.” As the former local secretary of the environment told us: “This is how officials see the issue of contamination, as a problem that some of us create for them.” Not for nothing, this official refers to the JICA report as an “Exocet . . . a missile capable of making a lot of damage, for other state officials, that is.”

A month after the second JICA report was released, the president of Argentina and the governor of Buenos Aires signed an agreement to relocate the petrochemical compound. In a public meeting in a local school, which only two years earlier had to be evacuated because of toxic leaks, President Kirchner (*Telam* 2003) said:

We want companies to come [to the country] to produce, but we are tired of them coming at any cost. . . . These companies generated a lamentable environmental situation. . . . The environment is part of our riches and part and parcel of our quality of life. [The compound] is an affront to the dignity of all the Argentines.

Neither local officials nor Shell personnel took this agreement or the public announcement that followed seriously. “They didn’t sign anything,” said actors (state officials and Shell personnel) who are usually on opposite sides of the debate. When we interviewed the current secretary of

the environment of Avellaneda, she admitted that the agreement for relocation of the petrochemical compound was an “optical illusion.” Events seem to suggest this is true. Since 2003, other than noncompulsory lead screening for the poisoned children (screenings that were constantly suspended or postponed), nothing has been done to address either the problem of environmental contamination or the massive poisoning head on, notwithstanding the incendiary pronouncements of public officials against the contamination produced by the compound.

On one hand, state officials raise the issue of contamination, publicly denounce the companies that operate the compound for its health-threatening emissions, push for a thorough study of the extent and effects of industrial pollution (but not its sources), and (in the words of none other than the president himself) promise the relocation of the compound. On the other hand, as we witnessed several times during the course of our fieldwork, state officials randomly show up in Flammable talking about relocation (not of the compound, but of the neighborhood) or to conduct a census presumably related to removal, but they then disappear without leaving a trace of any relocation plan. During our 30 months of fieldwork, we also witnessed state officials’ push for a thorough lead-screening program, which was then surreptitiously suspended and later arbitrarily restarted without explanation. In this way, the state’s “averted gaze,” represented in the words and deeds of high- and low-level officials, feeds uncertainty and confusion “by its implacable opacity, its refusal to comprehend, and its inability to act responsively to the human suffering that presents itself” (Scheper-Hughes 1992:294). How can residents *not* be puzzled if state officials, presumably in charge of their well-being, send such a barrage of confusing and contradictory messages?

DOCTORS’ (MIS)UNDERSTANDINGS

Several times in the course of formal interviews or informal talks, Flammable residents told us that local doctors advised them that if they and their children are to be cured, they must move out of Flammable. Other residents reported the confused and confusing silence of doctors concerning their complaints or doctors’ suggestions of an “aspirin prescription,” which

residents know “does nothing.” Some of them suspect that because “doctors are paid by Shell”—which is not true, even though the local center was built with Shell funds—they have to “keep their mouths shut.”

In extensive interviews conducted with physicians at the local health center, we encountered puzzling responses to our queries regarding the population’s precarious health and the connection to environmental contamination. Like the residents, the medical personnel showed an uneasy denial. They demonstrated an utter ignorance regarding the documented links between poison and individual health but had their own suspicions about (in a doctor’s own words) “something strange going on here.”

During our first visit (July 2004), we talked with a team of three doctors and a nurse about what they saw as a set of common health problems in Flammable. Drawing on their experiences in other poor areas, however, they contended that the pathologies affecting Flammable residents did not differ from those affecting other impoverished enclaves. In a diagnosis separating something that usually comes together (i.e., poverty and environmental degradation), they matter-of-factly said: “Illnesses here are the result of poverty, not of contamination.” They further said that respiratory diseases are not caused by pollution but “by the problems of poverty, such as overcrowding.” When asked why Flammable has a health center with a 24-hour emergency service, an operating ambulance, and seven working doctors on site—all very uncommon—their reply further accentuated their cognitive dissonance: “Well, yes, to tell you the truth, there’s something rare here. But we don’t know. Nothing is what [it] appears to be in Flammable.”

A year later (July 2005), we interviewed a pediatrician and a clinician who worked at the health center during the morning hours. They also denied the existence of pollution-related illnesses exclusive to Flammable. They too believed that the anemia and allergies in the community are quite common in other poor areas: “What you see here is the same thing you treat in [the poverty-ridden district of] Solano.” When quizzed specifically about the probable effects of pollution, they told us (in the individualizing logic typical among doctors) that until adequate case studies are conducted, any

conclusion about toxicity in the environment would be premature. At the same time, though, they added that the local population should be relocated because “this area is uninhabitable” (incidentally, one of the JICA air quality monitors was located at the health center and registered higher than normal concentrations of benzene there). They also told us about two recent cases that clearly undermined their own pronouncements that contamination is not the problem: “A while ago, two women became blind. That might be because of contamination.”

These two doctors did not know much about the JICA epidemiological study and thought (wrongly) that lead affects only the children of adults who work with lead. There are no contamination-related diseases here, they repeated several times. Yet, in the course of our conversation, it became apparent that they had little training in the detection and diagnosis of these kinds of diseases. In seven years of study at medical school, they only took one class on environmental health. One doctor tried to dispel her own never fully-articulated uncertainties about the situation by having herself tested (for lead, chrome, and toluene). Both doctors said that a physician left the center because “she claimed she was contaminated with toluene.” This physician was tested again at her new workplace and her levels of toluene were even higher. So, the doctors deduced, “it can’t be this place.”

These doctors are not alone in combining ignorance and suspicions. The associate director of the main hospital in Avellaneda, one of the largest hospitals in Buenos Aires, told the federal ombudsman office that his hospital did not have the ability “to identify the toxic substances or to conduct studies” on contamination-related illnesses. In his interview with a federal ombudsman team, this high-level functionary said he knew about the JICA study, but he admitted he had ignored its findings. Officials from the federal ombudsman office found the same lack of factual knowledge among the physicians of two nearby health facilities—both serving Flammable’s population—the Hospital Ana Goitía (specializing in pregnancies, births, and neonatology) and the Hospital Cosme Argerich.

Although the physicians seem convinced that there are no specific health pathologies in Flammable (they told us they communicate that

to their patients), their patients sometimes heard something different. Many residents told us that their doctors advised them to move out of Flammable because their sickness or that of their children might be related to their place of residence. We have no way of telling whether doctors actually conveyed this to them. What is important, however, is what residents think they hear from the doctors they trust. The contradictions between physicians' deeds and words and the apparent differences between their public attitudes and what they say in the context of individual interactions are sources of confusion. How can local residents *not* be mystified and mistaken if even local doctors are doubtful or wrong about the sources of disease in Flammable?

The media and Shell are two other powerful actors that exercise influence on the collective perceptions of risk that predominate in the neighborhood. As a key "node of risk communication" (Mythen 2004:95), journalists baffle residents because they randomly come into the neighborhood, focus on the most extreme aspect of life there, and then broadcast the news in the authoritative language of journalism, emphasizing how improbable life is in this "inferno" (as one national newspaper recently called Flammable). Neighbors believe that the media focus on, in their words, "bombs," only to disappear a couple days after the explosion. Newspapers often produce one-line, attention-seeking headlines such as "half of the children are contaminated" or "the compound causes cancer." Reporters seem oblivious to one basic truth: the residents of Flammable are not only producers of stories for the media, they also consume these reports (mainly those broadcast on TV). Residents' stories move out of the neighborhood to the TV and the newspapers, and they come back as one-sided, sensationalized scripts of dreadful lives, directed mainly at the larger public, not at Flammable residents. If the media unanimously tell them their life is an impossible one, we wonder: How can they *not* be puzzled?

Through authoritative spokespersons and a sustained public relations campaign (illustrated in the company's annual reports), Shell promotes a positive self-image of "total safety" that revolves around three key themes: sustainable development, corporate social responsibility, and protection of the environment and

future generations.¹⁵ In an extensive interview, the company's manager of health, safety, environment, and quality told us that the area surrounding the compound is "not fit for human residence because it is an industrial zone." Contradicting this statement, he also told us that, "Flammable residents have no problems that are associated with industrial activities. The problems the neighborhood has are those associated with poverty: drugs, alcohol, etc." With respect to the specific issue of lead contamination, he asserted, contrary to the JICA study, that "lead is in every shantytown." He continued, "It is not exclusive to Flammable. Lead has to do with poverty, with the fact that they [the poor] get a hold of what they have around them, for example they recycle car batteries. . . . Lead is not in the shantytown. Shanty dwellers *bring it into* the shantytown because they go out to scavenge, they fill their plots with rubble" (our emphasis). A full-fledged account of Shell's specific contribution to the labor of confusion and the way it interacts with the company's charitable work in the neighborhood is beyond the scope of this article (see Auyero and Swistun, forthcoming).

DISCUSSION AND CONCLUSIONS

Our long-term ethnography captures the collective construction of toxic uncertainty and mistake *in situ* as it unfolds.¹⁶ We were there when neighbors discussed their individual or collective fate, and when they wondered out loud about the possible short- and long-term effects of air, water, and soil pollution. We were also there when all sorts of simultaneous and often contradictory material and symbolic interventions were molding people's perceptions of their surroundings. We read the newspaper and watched TV with residents when news about the relocation of some plants in the compound was announced, and when municipal officials informed the public that "soon" hundreds of families were going to be moved out of the neighborhood "because of the contamination."

¹⁵ Shell's annual reports for 2001, 2002 to 2003, and 2003 to 2004 are available online (<http://www.shell.com.ar>).

¹⁶ For calls for ethnographic studies in naturalistic settings, see Vaughan (1998) and Wacquant (2005).

We were there when children's lead screenings were abruptly suspended and then suddenly restarted (without any official explanation), and when neighbors paid visits to the local doctors in search of a cure for their recurrent allergies. This was not a retrospective reconstruction but an embedded form of inquiry in real time and space (Wacquant 2005; Willis and Trondman 2000).

Once we ethnographically tilled the soil of existing meanings and behaviors related to surrounding contamination, we found neither the shared critical understandings regarding toxic danger nor the state discourse of denial or minimization described in the literature on risk perceptions and collective action around environmental issues. Instead, we uncovered confusion and contradictions. Toxic contamination is "inherently uncertain" (Edelstein 2003). A body's past exposures, the dose-response relationship, synergistic effects, and etiological ambiguity all contribute to the problem of haziness in both toxicology and epidemiology (Brown et al. 2000)—even more so when the activities of big companies are involved (Phillimore et al. 2000). In this article, we heeded the insights of cognitive psychology and organizational sociology and argued that widespread toxic uncertainty does not stem solely from the intrinsic complexity of environmental contamination, but it also stems from the relational anchoring of local residents' perceptions and from the labor of confusion performed by powerful actors.

"Patterns of information obscured problem seriousness," writes Vaughan (2004:331) in her exploration of the ways that a cultural belief in risk acceptability was produced and normalized within NASA. The identification and correction of problems such as recurring O-ring damage were, Vaughan (1990) argues, blocked by organizational patterns. These patterns (in NASA's case, autonomy and interdependence) undercut effective discovery and obstructed collective knowledge. The normalization of risk and the perpetuation of mistakes do not derive from technological complexity alone but also from organizational forms. Eden (2004) makes a similar argument when analyzing why the U.S. government did not incorporate predictions of fire damage caused by nuclear blasts into the organizational routines developed for nuclear war planning (see Tilly 2006). In both

cases, we see how perceptions are situated in specific social universes, or as Lupton (1999b:15) puts it, "housed within collective cultural networks." Recurrent relations within these universes condition what insiders overlook, fail to note, or misinterpret.

The radical contextualization of belief production that Vaughan and Eden advocate can be extended beyond the limits of complex organizations (e.g., NASA or the U.S. military) and into the less formalized but equally routinely governed world of a neighborhood.¹⁷ While the organizations responsible for the welfare and health of Flammable's residents were more dysfunctional and inept than the Shuttle and nuclear programs, the same anchoring of perceptions is apparent in the shantytown.

Risk frames (what people see, what they don't see, what they know, and what they don't know) are socially produced, but this production is hardly a cooperative creation. The anchoring of perceptions is a crucial process in the molding of the collective schemes residents use to assess hazards—a process manipulated by material and discursive power (Heimer 1988). Given that opinions and interventions are endowed with different power (Bourdieu 1991; Thompson 1984; Williams 1977), what physicians have to say about health in the neighborhood (and what they silence) and what the president or other state officials affirm, do, or avoid doing, carry a different weight than what a regular neighbor asserts or does.

Perceptions about a (toxic) environment should thus be analyzed as products of individual and collective biographies, as sedimentations of actors' previous place-based experiences (Bourdieu 2000; Schutz 1962). Toxic beliefs, or to put it in phenomenological terms, toxic experiences, are rooted in the interactions and routines that characterize a particular place. But perceptions of hazards are also manipulable, that is, they are susceptible to being molded by the practical and discursive interventions of powerful actors. The stock of knowledge actors have about their hazardous surroundings at a particular time and place is thus the joint product of the history of that place, the routines and interactions of its resi-

¹⁷ For another call for contextualization of risk perceptions, see Beamish (2001).

dents, and the power relations in which they are enmeshed. In scenarios like Flammable, collective attempts to lift the (toxic) veil that clouds actors' perceptions and to initiate processes of cognitive liberation (such as those analyzed under "popular epidemiology") will have to contend with the mutually reinforcing effects of local history, expressed in anchoring routines, and the power relations manifested in the labor of confusion.

Future work on contaminated communities should empirically examine the specific forms that the relational anchoring of risk perception takes and the varying influence of the labor of confusion. This empirical work should pay particular attention to the impact that both processes have on attempts to conduct "popular epidemiology." Researchers should also look at the presence of other individual and collective actors that might counteract the reproduction of toxic uncertainty (for work in this direction focused on NGOs, progressive state actors, and social movement activists, see Mello [1998] and Evans [2002]).

Typically, risk frames are used as an independent variable to explain the collective actions people take to protest (and protect themselves) against toxic hazards (Beamish 2001; Brown and Mikkelsen 1990; Lerner 2005; Tierney 1999). Although the general uncertainty that we analyzed may be related to the collective quiescence quite apparent in the neighborhood, this article did not focus attention on this analytically different phenomenon (for a classic statement on collective inaction and the power mechanisms involved in producing it, see Gaventa [1980]). We focused instead on the confused and mistaken beliefs people hold about danger as dependent variables, inspecting the social origins of these perceptions.

In the scholarship on social movements and contentious politics, no generalizable connection exists between participation and consciousness or, more specifically, between collective action and certainty. Protest might be the consequence, as well as the cause, of increasing critical awareness or knowledge (for different arguments, see Mansbridge and Morris 2001; McAdam 1982; Polletta 2006; Snow and Benford 1988; Tarrow 1998; Tilly 1978, 2003). Future research should empirically scrutinize the links between the social production of risk frames and their social outcomes—either protest

or quiescence. Such analyses will further our understanding of the connections between perceptions of danger and mobilization and, more generally, of the recursive relationship between collective understandings and joint action.

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