

WHY THE GRASS IS ALWAYS GREENER: UNDERSTANDING COMMERCIAL
PESTICIDE APPLICATORS AS ACCIDENTAL RISK COMMUNICATORS

A Thesis

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ABSTRACT

Within the risk communication literature, considerable attention has focused on messages delivered by “official” messengers. This research pursues an alternative course, examining unintentional risk messages and their “unofficial” carriers. Referred to in this study as “accidental risk communicators” (ARCs), these individuals routinely discuss health and environmental risks with the public as a secondary, not formally recognized part of their job. From the tanning salon owner explaining the “safety” of UV radiation, to the auto mechanic performing a routine inspection, to the commercial painter handling lead-based paint, ARCs span a variety of occupations. Since ARCs often represent for-profit businesses, the public may be suspicious of their message, perhaps assuming that the information reflects corporate avarice rather than “impartial” scientific information. Yet often blue-collar laborers, ARCs may appear more similar to some sectors of the public, and thus more credible than “remote” government officials. In some cases, the pressure to sell a product may lead the ARC to deemphasize risks, whereas an occupational injury may make certain risk factors more salient.

Though a novel term, the ARC concept relies on several strands of existing literature in the risk communication, science and technology studies, and management disciplines, among others. Central concepts included in this study were: technical and cultural rationality, expertise, invisibility, citizenship, emotional labor, perceptions of risk, and heuristic biases. While these concepts were identified prior to the study, in following a grounded theory approach, I assumed that other concepts would emerge from the data.

To begin explicating this concept empirically, this research examined the communicative practices of one sector of ARCs: turf and lawn-care workers in New York State who are trained and certified to apply pesticides, and often expected to

discuss health and environmental risks with both paying clients and curious onlookers. Licensed by the state, these individuals receive extensive training covering application methods and workplace safety, as well as basic principles of toxicology. Overall, the questions guiding this research were as follows: How do applicators make sense of the role they (do or do not) play in delivering risk-related information? How do CPAs make decisions about *when*, *what*, and *how* to communicate with their clients and the general public about pesticide-related risks? And, what are the dominant stories and themes used to characterize, make sense of, and discuss pesticide-related risks?

In-depth interviews were conducted with 29 respondents affiliated with the Green Industry in New York State, and short written questionnaires were received from 24 participants at the 2007 Empire State Green Industry Show. All respondents were affiliated with the Green Industry (e.g., landscaping, turf/lawn care, municipal parks, etc.), and the questions were designed to cover the main areas of the in-depth interviews. Interviews were recorded and transcribed, then coded line-by-line both by hand and with Atlas.ti qualitative data analysis software. (Questionnaire responses were coded similarly.)

Emergent themes were grouped into the following categories: the institutional culture of the applicator's workplace, the perception of a "successful" applicator, the perception of the applicator's "role," and the perception of risk and "Western" science, as related more centrally to turf and lawn pesticides. Among these themes, the idea of the applicator's work as "emotional labor" and/or "background work," and the effect of his occupational "expertise" on ideas of democratic citizenship are discussed in length. To continue building a theoretical foundation for the ARC concept, future research questions in these areas are posed. Practical implications for both Cooperative Extension and the Green Industry in the areas of applicator training, pesticide product labeling, and the "framing" of the industry are also discussed.

BIOGRAPHICAL SKETCH

Laura Rickard received a B.A. degree from Brown University in Environmental Studies, where her research focused on communication and informal learning with respect to global climate change. Prior to beginning post-graduate study, she held a position at North Country School/Camp Treetops in Lake Placid, NY, where she worked as a farm/garden intern and as an ESL (English as a Second Language) teacher. At Cornell, her research interests center on science/environmental communication and risk perception. She is particularly interested in how risk information is communicated in informal settings and by “non-traditional” or “non-recognized” individuals to the larger public. Another area of interest relates to how farmers seek information and make decisions related to sustainability issues, such as integrated pest management (IPM) and agricultural plastics recycling.

After completing a Ph.D. in Communication, Laura hopes to pursue either a university position or a government position in an environmental or agricultural-based agency. Whether in academia or not, she plans to maintain teaching and community outreach as central, rather than secondary, elements of her job. In her spare time, she enjoys playing the cello, running, hiking, gardening, and exploring beautiful places with family and friends.

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LIST OF ABBREVIATIONS

ARC - Accidental Risk Communicator

BCERF - Cornell University Program on Breast Cancer and Environmental Risk Factors

CCE - Cornell Cooperative Extension

CPA - Certified Pesticide Applicator

EPA – (United States) Environmental Protection Agency

FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act

IPM - Integrated Pest Management

MSDS - Materials Safety Data Sheet

NYS DEC - New York State Department of Environmental Conservation

NYSTA - New York State Turfgrass Association

OSHA - Occupational Safety and Health Administration

PEL - Permissible Exposure Limit

PPE - Personal Protective Equipment

REI - Restricted Entry Interval

WPS - Worker Protection Standard

CHAPTER 1.

INTRODUCTION & THE CASE

From the weather report, to a nutrition label, to a construction worker on the freeway, we receive risk information in varied forms on a daily basis. Both intended (weather advisories and warning labels) and unintended (the construction worker forgoing his hard hat), these messages permeate our day-to-day routines, shaping our understandings and perceptions of the underlying risks. Within the risk communication literature, considerable interest has focused on the effects of *intentional* messages on a variety of audiences, with major attention paid to “official” risk messages and messengers. Studies in organizational risk communication, for example, have examined best practices for institutions in relaying risk-based information (e.g., Chess, 2001). Often targeting government agencies, this rich literature deals with recommendations and priorities for organizations well aware of their status and responsibility as risk-communicators (e.g., Zarcadoolas, Pleasant, & Greer, 2006). Central to many of these studies is the admonition that these risk communicators, from one official to an entire agency, both recognize and respond to the needs of the particular audience (e.g., Juanillo & Scherer, 1995). Likewise, literature on health campaign development deals with awareness of audience as central to crafting effective, appropriate risk messages that resonate with targeted populations (e.g., Rogers & Storey, 1987; Scherer & Juanillo, 1992; Dervin, 1989). As Zarcadoolas, Pleasant, & Greer (2006, p. 165) sum up, “A tacit agreement, long established between public health officials and the publics they serve, is that timely, accurate, and trustworthy information will be delivered in order to safeguard people’s health and well-being.”

Accidental risk communicators

Rather than focus on the format of “official” sources of risk information, or the effects of these transmissions on public audiences, this research will pursue an alternative course: *unintentional* risk messages, and their unlikely carriers. The following research examines a critical source of the public’s risk information, a motley collection of individuals ubiquitous in our daily life, yet fundamentally understudied. As a group I will call “accidental risk communicators” (hereafter referred to as “ARCs”), these individuals serve as unofficial sources of risk information; they are routinely called upon to discuss risk with the public often as a secondary, and *not necessarily formally recognized* part of their job. Moreover, these individuals may *not* necessarily perceive themselves as serving the role of risk communicators with the public, nor feel *accountable* to the public in terms of answering questions or volunteering information. Since ARCs often represent for-profit businesses, the public may be suspicious of their message, perhaps assuming that the information reflects corporate self-interest, rather than “impartial” scientific information. Finally, ARCs may have participated in a variety of formal hazard or safety trainings and may deal with technical risk messages, such as warning labels, on a daily basis.

While ARCs have gained little to no notoriety in the literature thus far, the justification for more systematic study connects to several current areas of study in risk communication. As a potential first line of communication with the public, ARCs may also be the *only* communication the public receives about particular health-risk issues. Often blue-collar laborers, ARCs may also be perceived by some members of the public as more similar to themselves; recent studies on the effects of trust and credibility in risk communication lead to the hypothesis that some individuals might judge the ARC to be more credible or trustworthy than a “remote” government official (e.g., McComas & Trumbo, 2001; Slovic, 1993). Due to the nature of their jobs, ARCs

may receive inadequate training in communicating with public audiences, and/or may be reluctant to engage in dialogue with the public. Moreover, because they likely collect and receive risk information from varied sources, ARCs may be conflicted (or confused) about *which* information to communicate with the public. Significant experiences both on the job and in their personal life may also contribute to positive or negative attitudes towards the risk. The pressure to sell a product or service, to report to a boss, or to receive a commission may lead the ARC to deemphasize risks. On the other hand, having a family member with an injury or sickness may lead the ARC to be more sensitive to certain risk factors.

Of the limited studies that have (arguably) involved an ARC population, the particular emphasis has been on case studies of *crisis* rather than day-to-day situations. For example, through interviews and focus groups with affected postal service employees, Quinn, Thomas, & McAllister (2005) as well as Blanchard et al. (2005) discuss the overall failure of federal and state-level health authorities to communicate effectively with US postal workers throughout the 2001 anthrax emergency; what the studies *fail* to address, however, is how these workers, in turn, might have communicated health information with their clients, the greater public. While studying the communicative practices of formal institutions is no doubt critical, this research posits that ARCs, too—such as these postal workers—be included in the formal study of how risk messages reach the general public and how these messages can be best constructed.

The case

For the purposes of this research, New York commercial pesticide applicators in the turf and lawn care industry served as representative ARCs. Trained and licensed

to apply pesticides¹, these individuals function as both *receivers* and, more importantly, *sources* of risk information. As *receivers*, they participate in state mandated commercial pesticide applicator certification and re-certification courses, as well as training programs sponsored by their employers. While the targeted population included turf and lawn care workers in the state, for the sake of comparison, a small number of individuals applying pesticides inside residential and commercial buildings were also included. (See Chapter Three: Methods for further explication of the sample.)

Whether treating a residential lawn, maintaining a golf course, or spraying a university athletic field, commercial pesticide applicators often are primary information *sources* to the greater public about pesticide-related risks. Perhaps a client's neighbor voices concern about the health of her pet, or a university student wants more information on possible carcinogens. In these and other cases, workers pass on information through both their words and behaviors (e.g., wearing protective clothing). In any given situation, these workers face critical choices about which form or forms of communication to engage in with the public. In some cases, individuals may even decide to forgo interpersonal communication entirely; instead, they may choose to avoid the confrontation, distribute written materials, or simply defer questions to a boss or supervisor. How these workers perceive and evaluate environmental and health-related risks may play a critical role in both *what* and *how* they communicate with the public, as well as the effectiveness of this communication. Thus merging the roles of source and receiver, commercial pesticide applicators must

¹ According to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the term "pesticide" refers to: 1) any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. 2) Any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

interpret technical risk information, and, in turn, digest it into a form appropriate for their own needs, as well as those of the public.

Turf and lawn care pesticide use in New York

The increasing presence of commercial pesticide applicators on both residential properties and public grounds has prompted both tacit acceptance and vocal outrage—a dual response that may be representative of the culture surrounding pesticide use. Beginning with Rachel Carson’s watershed publication *Silent Spring* (1962), the American public has become increasingly aware of the human health and environmental implications of pesticides. Yet domestic pesticide use continues to abound, notably among homeowners who spend increasing amounts of money for the emerald of suburbia: the green lawn. Within the state of New York, 3.4 million acres are covered in lawn or turf (Rossi & Grant, 2006), and hundreds of thousands of pounds of pesticides are used to treat these areas annually (Lee, 2006). Rising concerns about the health of citizens, including the threat of cancer, has prompted New York counties and cities to pass ordinances limiting pesticide use (New York State Department of Environmental Conservation, 2007). As of January 1, 2008, ten counties, including Tompkins and New York City, had “opted in” to the Neighbor Notification Law, a regulation requiring a 48-hour notice of a residential commercial lawn application for occupants of single and multiple dwelling homes, and other occupied structures. Applicators are required to post visual “notification markers” in these settings, and retailers selling general use lawn pesticides must provide similar signage (New York State Department of Environmental Conservation, 2007a).

Instead of applying pesticides, many state farms, schools, and public areas have begun to substitute integrated pest management (IPM) to protect crops, buildings, and grounds from pests like insects, rodents, plant pathogens, and weeds. Grieshop, Zalom, & Miyao (1988, p. 77) describe IPM as a “complex cluster of technologies that

include specific sampling methods, timing of those methods, data collection and record-keeping, and communication, among others.” In recent years, considerable funding has been devoted to statewide IPM research, education, and outreach through the New York State Integrated Pest Management Program, a programmatic division of Cornell Cooperative Extension.² Despite the increasing adoption of these alternative techniques, however, Wargo, Adelman, & Wargo (2003) estimate that as much as several *million* pounds of pesticides are used annually on lawns and turf within the state.

Certified pesticide applicators (CPAs): NY and federal legislation

While there are three “tiers” of *commercial*³ pesticide applicators in the state of New York—commercial pesticide apprentices, certified commercial technicians, and certified commercial pesticide applicators (CPAs)— for the purposes of this research I focused on the “highest” tier: CPAs.⁴ To become certified to apply pesticides commercially in the state, individuals must pass two written exams administered by the NY State Department of Environmental Conservation (NYS DEC). While the “core exam” covers application methods and workplace safety, as well as principles of basic toxicology, entomology, and environmental science, a “category exam” deals with concepts central to the particular pest control area in which the applicator works (e.g., “turf and ornamentals”) (Cornell University PMEP, n.d.). Importantly, for the purposes of understanding this case study, a certified commercial applicator may:

- Purchase or use any pesticide for commercial application.

² See <http://nysipm.cornell.edu/> for more information.

³ In the context of this discussion, “commercial” refers to application that is *not* private, and/or at a residence.

⁴ To date, there are approximately 27,000 applicators licensed in NY and roughly 75% of these individuals are commercial applicators. There are approximately 300 commercial applicators employed by Cornell University (Jerry Kimmel, NYS DEC, personal communication, May 16, 2007).

- Supervise or train other individuals to make commercial applications (Cornell University PMEP, n.d.).

In addition to the above responsibilities, CPAs may also engage in mixing, loading, transporting, and storing pesticides, as well as cleaning equipment and preparing chemical waste for disposal. Applicators must also pay annual fees and maintain up-to-date re-certification credits, most often awarded through attending additional training seminars and workshops. Finally, as outlined in the 1996 Pesticide Reporting Law (Environmental Conservation Law Article 33, Title 12) each year the CPA is responsible for maintaining records documenting each commercial pesticide application he or she administered.⁵ Subsequently, the NYS DEC compiles this information yearly from statewide applicators and submits it to the Governor in the “Annual Report on New York State Pesticide Sales and Applications” (New York State Department of Environmental Conservation, 2007b).

Once certified in the state of New York, CPAs must follow the guidelines of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), a piece of legislation first established in 1947 to register pesticides and establish standards for labeling (Whitford, 2002). Under FIFRA’s first iteration, the U.S. Department of Agriculture (USDA) oversaw this registration process; however, since its establishment in 1972, the Environmental Protection Agency (EPA) has since been awarded jurisdiction over the registration of pesticides in the US. Importantly, under NY law, NYS DEC retains the right to “modify” the list of pesticides approved at a federal level and has made a large number of federally registered pesticides *illegal* to

⁵ The CPA’s records must include: EPA registration and number, pesticide name, quantity used, date and address of application, dosage rate, target organism, method of application, and place of application.

use in the state.⁶ Generally speaking, federal and state agencies rate the hazard posed by the pesticide by determining the toxicity of the pesticide times the exposure, with toxicity based on acute (i.e., single, short-term event) rather than chronic exposure; however, this complex risk analysis process also involves accounting for the various economic and social *benefits* to society (e.g., higher crop yields) introduced by the pesticide.

Before pesticides can be legally sold, distributed, used, or transported within the state, NYS DEC must register them; registration lasts two years, after which time the registration must be renewed. Should the pesticide's registration fail to be renewed, selling, purchasing, distributing, or using the pesticide within the state would be rendered illegal. Applicators as well as other members of the public can access a list of currently registered NYS pesticides either through their local Cornell Cooperative Extension office, or online at the NYS DEC website (Cornell University Pesticide Management and Education Program, n.d.).

An amendment to FIFRA added in 1992 known as the Worker Protection Standard (WPS) protects pesticide handlers by making employers responsible for certain safety standards. More specifically, WPS ensures that employers train their employees in safe application techniques, provide the appropriate personal protective equipment (PPE), and arrange for any necessary medical care. Moreover, 24 hours before a pesticide treatment, employers must post accurate signage denoting the restricted entry interval (REI) of a treated area, ensuring that signs remain for an additional thirty days past the REI expiration. For the most part, WPS pertains most directly to pesticide applicators in the agricultural sector, and thus was not considered specifically in this research.

⁶ Currently, approximately 50,000 products are registered at the federal level whereas only 9,800 are registered for use in New York (Eric Harrington, Cornell University Office of Environmental Health & Safety, personal communication, May 16, 2007).

Also regulated under FIFRA, pesticide product labels represent another source of risk information immediately available to CPAs. According to FIFRA, the “label” refers to the written, printed, or graphic matter on *or* attached to the pesticide.

Included in this label is:

- The brand name (e.g., Malathion)
- The pesticide type (e.g., insecticide)
- The active ingredient and percentage of active ingredient
- EPA registration number
- Precautionary statements (e.g., “You must wear a long-sleeved shirt.”)
- PPE standards (e.g., respirator, gloves, etc.)⁷
- A “signal word”(e.g., “danger”; “warning”; “caution”)⁸

Per New York State law, the applicator is required to supply the home occupant with the label information prior to the application; as of July 3, 2007, homeowners are now able request this information in either written, digital, or electronic format. When applying the pesticide, the applicator must also keep a hard copy of the pesticide label, as well as his applicator license on his person at all times (New York State Department of Environmental Conservation, 2007a).

In addition to the pesticide label, a materials safety data sheet (MSDS), again, federally-regulated, provides risk information to both the CPA and the public. As part of a firm’s “hazard communication program,” the MSDS includes information about the pesticide’s chemical make-up and toxicity, as well as safety measures necessary in the event of exposure. More specifically, the front page includes the chemical name,

⁷ PPE includes protective gear for skin (dermal entry), mouth, eyes, and respiratory system (lungs). To comply with federal law, the applicator must wear *at a minimum* what is indicated on the package, but has the option of wearing more extensive PPE.

⁸ Per FIFRA, a particular signal word is assigned based on the outcome of six acute toxicity studies (e.g., acute oral toxicity, dermal toxicity) performed with the product formulation. The signal word corresponds to the most *severe* toxicity category result for the product (US Environmental Protection Agency, 2007).

hazardous ingredients/chemical identity (e.g., Permissible Exposure Limit (PEL) set by the Occupational Safety and Health Administration (OSHA)), physical characteristics (e.g., smell, appearance, melting and boiling temperatures), as well as fire and explosion data (e.g., flammability). The back page includes reactivity (i.e., incompatibility, instability), health hazards, usage, handling, and storage (i.e., how to clean up a spill), and special protection and precautions (e.g., PPE). While the MSDS provides limited information on carcinogenicity, current federal pesticide labeling laws allow manufacturers to omit information on cancer or other *chronic* (i.e., long term) health effects from pesticide product labels (U.S. Environmental Protection Agency, 2003).

To better understand this case study, we must also discriminate between what is referred to as “general use” versus “restricted use” pesticides. General use pesticides can be sold by any business and purchased by citizens or businesses for use on their own property. Seen as posing minimum risk to the applicator, these pesticides can be applied without a commercial license. In order to sell or apply “restricted use pesticides”—a category of chemicals that the EPA or NYS DEC classify due to increased risk to human health and the environment—one must obtain a commercial permit (Cornell University PMEP, n.d.). Per FIFRA, an individual may not use a restricted-use pesticide in a manner inconsistent with its label; once the package seal has been broken, the individual is required by law to be a certified applicator.

Thesis overview

Clearly, identifying certified commercial pesticide applicators as ARCs raises significant questions as to the nature of communication between these individuals and the public. Having been exposed to both technical (e.g., trainings) and cultural (e.g., personal experience) understandings of risk, how does the applicator draw from these divergent “rationalities” (Plough & Krinsky, 1987) to communicate risk to the public?

How do race, gender, and other “sociopolitical factors” like perceptions of trust and stigma (Finucane, Slovic, Mertz, Flynn, & Satterfield, 2000) affect the risk perceptions of the applicator? How do these perceptions translate into what the applicator chooses to say to a member of the public? Chapter Two of this thesis explores these and other questions that contribute to describing a commercial pesticide applicator and, more generally, a prototypical ARC. Drawing from literature in risk communication and allied fields, I suggest critical characteristics of these individuals, as well as the challenges they face.

While this research followed a grounded theory approach, it is nonetheless prudent to explore elements of the current literature that were expected to become relevant during data collection and analysis. Chapter Three presents the research methodology, including a discussion of the generalizability and validity of qualitative research. In Chapter Four, I outline the results of the research, coupled with analysis and discussion of these findings. Chapter Five follows with pertinent conclusions and implications for further research. Appendices appear at the end of the document to include data and analysis peripheral to the core research findings.

Broader impacts

This research seeks to complement a three-year Hatch/Unilever-funded project begun in 2006 by Cornell University’s Program on Breast Cancer and Environmental Risk Factors (BCERF). BCERF, affiliated with the Sprecher Institute for Comparative Cancer Research, conducts research, publishes and consolidates materials, and provides educational resources about cancer in both humans and animals. As the primary focus of the project, a Fall 2007 mail survey of certified commercial pesticide applicators in New York gauged risk knowledge and perceptions as related to pesticides and cancer, as well as the degree to which health-related knowledge, attitudes, and concern can predict both risk perceptions and precautionary intentions

and behavior (Clark, Ota, & Snedeker, 2006). While survey results are undetermined at the time of writing, the following study supports the survey data with in-depth interviews with commercial pesticide applicators about the nature of risk communication between the workers, their clients, and the greater public. The analysis generated by this study will hopefully contribute to the ultimate goal of the BCERF project: creating effective health risk communication and educational strategies to share with Cornell Cooperative Extension (CCE), the applicators themselves, and, in turn, the greater public.

CHAPTER 2.

THEORETICAL PERSPECTIVES ON ARCs

Who is an ARC?

Examples of ARCs span a wide variety of occupations. Consider, for example, the tanning salon owner who assures a potential customer that the tanning bed—and accompanying UV radiation—is “absolutely safe.” Likewise, tattoo and piercing artists may explicate the risk involved in a particular (voluntary) procedure to a potential client, all the while displaying their own body jewelry and inked extremities. A health food store employee may swear by a certain nutritional supplement, claiming its (scientifically unsubstantiated) power to cure a laundry list of ailments. Auto mechanics are routinely called upon to formulate and communicate judgments about the safety of a vehicle, and the customer must decide whether a particular estimate reflects the risk posed by a faulty car part, or the avarice of the mechanic—or perhaps, a bit of both. Commercial painters may occupy the ARC role on an occasional basis, and, like the pierced tattoo artist, often through their appearance rather than their words; in neighborhoods rife with lead-based paint, a painter without appropriate safety gear sends a powerful risk message to the surrounding community.

From some of the examples listed above, one might dismiss the ARC as a commonplace blue-collar worker—in the case of the commercial pesticide applicator, a laborer charged with killing weeds and eradicating pests with his chemical arsenal; given the centrality of these figures in communicating both scientific and risk-related information to public audiences, however, this conception may be lacking. By describing the interplay between credentials, competing rationalities, and multiple memberships, as well as providing salient examples, the following section draws a more complex picture of the role of the ARC and the character of his or her “expertise.”

Invisible technicians and background workers

Within the Science & Technology Studies (S&TS) literature, the term “invisible technician” has been used to describe a practitioner contracted to perform various duties related to the scientific pursuit; a “right hand man” to a prominent scientist, the technician attends to crucial, yet often overlooked or “invisible” responsibilities. Steven Shapin (1989) introduced the concept in the context of the quintessential 17th century laboratory technician, assisting the likes of natural philosopher Robert Boyle by setting up apparatuses, recording observations, and carrying out experiments; however, Shapin and others have also applied the concept to technicians in modern laboratories. According to Shapin, such individuals were historically thought of as contributing manual skill, not intelligence; while they might have constructed the physical air pump, they did not construct the scientific truths emerging from its use. Despite their skill at performing day-to-day tasks, technicians were usually afforded little autonomy. Accompanying this emphasis on brawn over brains, as Shapin points out, was the perception that *anyone* could perform the type of tasks allotted to the 17th century technician. Few scientists, and even fewer members of the general public, recognized the tacit knowledge and craftsmanship required to complete the job, leading to the perception that “such workers [were] easily interchangeable on the labor market” (Shapin, 1989, p. 557). When technicians *did* become both visible and accountable, however, was in the wake of a problem, such as a malfunctioning apparatus; in such cases, the technician could be used as a scapegoat, an “understood moral resource for explaining and excusing experimental failure” (Shapin, 1989, p. 558).

Ultimately, Shapin argues that these sensibilities have been perpetuated in similar form in modern laboratories, in that technicians often “carry out the manipulations dictated by the results of the scientists’ thoughts” (Shapin, 1989, p.

562). While this work is indispensable to the process of generating results, the contributions of most technicians become opaque in the “official representations” produced, such as authorship of journal articles. Beyond the laboratory context, Christopher Henke (2000) equates the field workers assisting an agricultural field trial to invisible technicians, in that they perform tasks that are critical, yet unrecognized, to the completion of the scientific experiment. Through “deep knowledge of farming practices, and of the criteria used for judging the maturity and quality of crops” (Henke, 2000, p. 498), these workers are indispensable to the research process, yet rarely mentioned in the resulting publications.

Unlike the laboratory technician stuck in the back room of equipment, or the farm worker toiling in the corner field, an ARC’s job may be quite prominent in a purely physical sense. Working in public parks, school athletic fields, and front lawns, the commercial pesticide applicator’s work, for example, may even appear to be on display, virtually open to public scrutiny. While Shapin argues that the 17th century technician became both visible and culpable only when experimental equipment or processes failed, in the case of the pesticide applicator, visibility and blameworthiness may be more closely associated with the *stigma* attached to their job. When a community opposes the use of pesticides, for either human health or environmental reasons, the applicator may become the target of such backlash. This association of an individual with deeply held, negative, cultural values may prevent the community from both appreciating the craftsmanship of the job and respecting the science of pest control. (Further discussion of the idea of stigma will be provided later in this chapter.) Unlike the field worker or lab technician, whose “invisible” tasks ultimately lend legitimacy to an end product of “Western” science, the CPA’s transparent—yet contested—actions can also place the authority of entomology, plant pathology, toxicology, and epidemiology (to name a few) in question.

Star & Strauss' (1999) conception of "background work," part of a typology of what the authors refer to as "invisible work," perhaps comes closest to illustrating the situation faced by commercial pesticide applicators and perhaps ARCs in general. Distinct from Shapin's invisible technician's role, the authors describe background work as *very* visible in a physical sense; however, this ubiquity often results in the work being taken for granted, "relegated to a background or expectation" (Star & Strauss, 1999, p. 15), and perhaps not afforded the legitimacy and respect it deserves. Using health care workers as an example, Star & Strauss argue that all the multiple dimensions of their work are not fully codified. As a result, some of the critical roles these workers play can be overlooked, neither factored into a fair monetary remuneration, nor into an understanding of how the entire healthcare system functions. In a similar vein, while ARCs are recognized for performing a variety of occupational tasks, they may not be seen as providing other non-quantifiable "services," such as communicating risk to the public or legitimizing applied sciences. To sum up, Star & Strauss argue that "disembedding" previously "embedded" work can lead to further professionalization and legitimization of both the workers and the work itself.

Informal caregivers

Informal caregivers can be classified as so-called "background workers" who may embody characteristics of ARCs, and thus provide an interesting group to examine. Often lacking formal medical training, these individuals provide care and make routine decisions on behalf of ill or disabled care receivers. Historically, the tasks performed by informal caregivers were documented and described in terms of "activities of daily living" (ADLs) such as bathing and eating, and "instrumental activities of daily living" (IADLs), such as transportation; however, researchers have increasingly noted the inability of these standards to fully capture the extent of what informal caregivers do on a daily basis (Levine & Hart, 2004). Just as ARCs may end

up acting as risk communicators without any formal communication training, Albert (2004, p. 108) explains that:

We unfairly expect family caregivers, who usually lack any kind of formal medical or nursing training, to make difficult medical decisions and also to bear responsibility for the consequences of these decisions.

From juggling medical bills to scheduling appointments to dealing with an incontinent patient, informal caregivers wear several hats. Not unlike ARCs, informal caregivers learn on-the-job, often mastering by trial and error the unrecognized, yet essential, everyday tasks: where to purchase special equipment, how to perform complicated procedures, etc. (Levine & Hart, 2004). As Levine & Hart (2004, p. 31) note, “many of these tasks do require specialized knowledge and skills unprecedented for lay persons, sophisticated communication abilities, and the ability to reason and exercise judgment.”

Despite the variety of techniques available to make ADLs and IADLs more manageable, most caregivers receive neither the necessary training nor information (Levine & Hart, 2004), and no documented studies have examined how informal caregivers learn to perform these complex tasks (Albert, 2004). Viewing ADLs and IADLs as inadequate indicators, researchers have begun to examine new methods of measuring the “job description” of the informal caregiver, such as sophisticated matrices that lay out the degree of compliance of the patient and the frequency with which care is needed (Albert, 2004). Ultimately, researchers suggest using these assessments for, “developing new and more sensitive programs to train, support, and counsel caregivers” (Gould, 2004, p. 139). ARCs, too, face a variety of challenges based on their occupation, from physical risks to emotional stress, to stigma (See “*What challenges do ARCs face?*” later in this chapter). To date, no known research has documented the particular ways in which ARCs communicate risk, nor have

formal communication training programs been adapted by many of the industries employing ARCs.

Journalists

Yet another example of ARCs, journalists battle daily deadline pressure while translating risk issues into articles that appeal to their readership. Often more concerned with framing their story to meet audience expectations of “newsworthiness”—such as “timeliness, proximity, prominence, consequence, and human interest” (Sachsman, Simon, & Valenti, 2004) —they may worry less about the most appropriate way to communicate a risk message to their audience. In a study of regionally-based environmental reporters throughout the US, Sachsman et al. (2004) found that journalists tended to seek out and report events via a professional “gut instinct,” based in part on *affect* (see Slovic, Finucane, Peters, & MacGregor, 2004) and informed by learned reporting skills. Through interviews with the reporters, the authors found “risk assessment” to be the *least* used of nine possible story angles, and noted the infeasibility of relying solely on journalists to disseminate this class of information. Sachsman and colleagues (2004, p. 414) conclude that their study:

Underscores the potential information gap between scientists, who spend their life working in a given area of inquiry, and the environmental reporters in this story who spend, on average, from about one-third to half of their time on environmental stories.

Even though a significant population may rely on their publications as a *primary* source of risk information, journalists may consider risk communication as only a secondary part of their job, *if part of their job at all*. As research continues to publicize the effects of mass media messages on the public, however, more significant attention has been paid to increasing journalists’ formal education in both risk and science communication.

More recently, Wilson (2008) has explored the role played by US television weathercasters in providing science information to the public. Noting that little is

known demographically about these individuals, Wilson and colleagues have conducted a series of baseline surveys. These results have provided initial, descriptive insight into the background of these individuals (e.g., educational training and professional credentials), as well as the multiple ways in which they may be acting as science communicators both within *and* outside of the TV broadcast (e.g., public service projects). The author touches on the multiple “roles” performed by the weathercaster, as dictated by the television industry:

Television weather demands an unusual combination of skills: relaxed and conversational but energetic and upbeat, and it’s a lot more difficult than it looks. Being a good scientist is only part of the task...Being only an entertainer, as previous episodes in television weathercasting allowed and encouraged, is no longer enough to do the job well either (Wilson, 2008, p. 74).

Wilson’s characterization of the multifaceted demands of the TV weathercaster provides a fitting segue into a discussion of the characteristics of ARCs.

What are some of the characteristics of ARCs?

Personality

While many ARCs may not necessarily perceive themselves as being risk communicators, could certain personality traits cause some individuals to shy away from, or even actively avoid, communicating with the public? If an ARC does not consider communicating with the public as implicit in his or her job description, would she still be concerned with perfecting her “communication skills”?

Anecdotally, some have likened the stereotypical CPA in the turf and lawn care industry to a lone, rugged cowboy riding his horse across the desert, bringing to mind the “Marlboro Man” of former Philip Morris fame. Cowboy or not, for some ARCs—those who prefer to ride their horses, motorcycles, or lawnmowers into the sunset—engaging in interpersonal communication with a concerned client may constitute a less than appealing part of the job.

Race, gender, and risk perceptions

At first blush, referring to CPAs in the turf and lawn care industry as “Marlboro Men” may seem altogether accurate in New York State, given that commercial pesticide applicators in the turf and lawn care industry comprise a largely homogenous demographic group. From the smaller local private businesses to the local chapters of national firms, the industry is dominated by young to middle aged white males. For example, a recent preliminary survey and focus group study of turf and lawn-care workers in three upstate New York cities conducted by Clark, Ota, & Snedeker (2006) reported 96% of respondents as male and Caucasian. While statistics on race and gender among certified commercial applicators in NY are unknown at the time of writing, survey results to be released by Cornell University’s BCERF will soon make this information more readily accessible (see Chapter 1).

To the extent that risk perceptions vary somewhat predictably by gender, race, and a variety of sociopolitical factors, the more homogenous ARC populations, like CPAs in the turf and lawn care industry in New York, might be expected to share certain values about the nature of pesticide-related risks. While a robust literature supports gender and racial differences and environmental and/or risk perceptions (e.g., Adeola, 2004; Blocker & Eckberg, 1997; Bord & O’Connor, 1997; Davidson & Freudenberg, 1996; Dietz, Kalof, & Stern, 2002; Johnson, 2002;), one stream of inquiry dealing with the proposed “white male effect” considers the role of sociopolitical factors in explaining these attitudes and perceptions. Based on the seminal work of Flynn, Slovic, & Mertz (1994), Finucane et al. (2000) used results from a national telephone survey to propose that worldview, trust, and stigma underlie an individual’s perception and valuing of risks. The authors consistently found white males to judge health and technology-related risks lower than minority groups and women; however, the authors suggest that this “white male effect” appeared to be

linked to a third of the total white male sample, a sub-group the authors refer to as “low-risk white males.” Lending support to the hypothesis of underlying sociopolitical factors, Finucane et al. (2000, pp. 160-161) found that:

When these low-risk white males (LRWM) were compared with the rest of the respondents, they were found to be better educated, had higher household incomes, and were politically more conservative. They also held very different attitudes, characterized by trust in institutions and authorities and by anti-egalitarianism, including disinclination toward giving decision-making power to citizens in areas of risk management.

Since this study, subsequent research has demonstrated a similar effect among Asian males, leading several authors to challenge the designation of a “white male effect” and argue instead for a “low risk effect” (e.g., Palmer, 2003). Notably, in a study of individuals populating the industrialized, highly toxic “Cancer Alley” in the Southern United States, Marshall (2004) found evidence for the “white male effect” even while purposefully excluding white males with higher socioeconomic status (i.e., household incomes above \$32,000) from the sampling criteria. Suggesting that “vulnerability” may operate as an affect heuristic to “cue” risk perceptions, the author speculates that:

Perhaps less vulnerable White males perceive industrial production as a source of economic benefits with few risks, while the more vulnerable Black females perceive industrial production as a threat to the health and safety of family with few economic benefits (Marshall, 2004, p. 474).

Marshall notes that future research should attempt to unpack the complex relationship between risk perceptions and gender/racial categories by identifying the underlying mechanisms, such as: “vulnerability, social structural position, trust in government, socioeconomic status, and efficacy” (Marshall, 2004, p. 474).

In answer to this call, more recently, Kahan, Braman, Gastil, Slovic, & Mertz (2007) have proposed that the “white male effect” stems from the merging of the social psychology concept of identity-protective cognition with the cultural theory of risk perception (Douglas & Wildavsky, 1982; Rayner, 1992). Focusing on *cultural identity* (e.g., hierarchical, egalitarian, or communitarian orientation) rather than

gender and race, the authors find that, “individuals are disposed selectively to accept or dismiss risk claims in a manner that expresses their cultural values” (Kahan et al., 2007, p. 467). Based on survey responses, they go on to suggest that the skepticism and insensitivity toward certain risks expressed by particular individuals, such as white males, can be thought of as a “defensive response” (Kahan et al., 2007, p. 467); in other words, individuals may adapt these protective attitudes when they feel that “activities integral to social roles constructed by their cultural commitments” (Kahan et al., 2007, p. 467) are being challenged. As the authors conclude, “Demographic variance in risk perceptions...grew out of cultural variance. Gender affects risk perception only in conjunction with particular worldviews” (Kahan et al., 2007, p. 492). Importantly, the authors add that “identity threats” which may, in turn, motivate identity-protective cognition, do not apply solely to white males; depending on the risk issue, women or other minority groups might display similar behavior.

Despite their similarities in race and gender, we cannot assume that New York CPAs in the turf and lawn care industry necessarily hold all the sociopolitical attitudes and opinions, and exhibit the characteristics (e.g., income and educational level) to the degree that would lead to a so-called “low risk white male” distinction. As Finucane et al. (2000) note, making assumptions about a group’s attitudes or beliefs based solely on demographics can be problematic since certain individuals may be, “more prone than others to endorsing individualism or egalitarianism, regardless of gender or race” (p.170). As Marshall (2004) and Kahan et al. (2007) have suggested, these differences in worldview seem to play a deeper role in predicting risk perceptions, than do surface demographics. Regardless of whether NY CPAs share a similar “cultural identity” (and in following, a similar perception of the risk of pesticides), it is possible that they may perceive pesticide-related risks differently than some of the individuals they encounter in the diverse communities they serve. The same may hold true for other

ARCs and suggests consequences for how successfully these individuals can communicate with their public audiences.

Cultural and technical rationality

From attending certification trainings, to following safety labeling, to sharing experiences with family and friends, ARCs are exposed to myriad risk interpretations and associated risk perceptions. Historically, quantitative risk analysis may have contributed to widening this gulf and characterizing the public's perception of risk as inaccurate or irrational (Plough & Krinsky, 1987; Slovic, 1987); however, increasingly, researchers are addressing diverging reactions between the public and the "experts" as reflections of different *rationalities*. In a sense leveling the risk analysis playing field, the designation of "rationalities" recognizes both "technical elites" and "non-elites" as holding important understandings and evaluations of risk. Plough & Krinsky (1987) describe "technical rationality" as an orientation to risk incorporating hypothetico-deductive methods and privileging logical consistency. The authors define "cultural rationality" as encompassing the affective, social, and cultural interpretation of risks; in this sense, risks cannot be understood or measured apart from their social and cultural contexts.

In many respects, applicators inhabit two "realms" of rationality simultaneously: as lay citizens, they bring a "cultural rationality" to the understanding of the science and risk inherent in pest control, and as trained technicians, they are exposed to a "technical rationality" founded on Western science. Interestingly, in a case study examining a risk dispute in a community hosting a nuclear weapons production site in Fernald, Ohio, Hamilton (2003) noted that these particular rationalities may act as "sources of rhetorical invention," functioning to influence participants' frames of risk acceptance, definition and interpretation of the situation, and crafting of persuasive appeals (Hamilton, 2003, p. 291). Importantly, Hamilton

(2003) found that both technical experts *and* members of the general public employed elements of both risk orientations, using these combinations to generate “frames of acceptance” towards the risk. Hamilton’s study thus underlines the ubiquity of both technical and cultural rationalities in the process of communicating about risk within diverse audiences.

Affect and availability

While ARCs may be exposed to a “technical rationality” perspective in official trainings or company literature, they may also adapt a “cultural rationality” perspective from experiences outside of the workplace. An ARC’s experience with a particular risk, or the experience of his or her friends or family, contributes to the *availability* of that particular risk for the individual and influences decision-making. Tversky and Kahneman (1974, p. 1127) define availability as a judgmental heuristic related to the “retrievability” of a particular issue, subject, or event: the “...ease with which instances or occurrences can be brought to mind.” According to the authors, availability can result in predictable biases in perception and judgment of risk. For example, the authors note that:

In general, instances of large classes are recalled better and faster than instances of less frequent classes; that likely occurrences are easier to imagine than unlikely ones; and that the associative connections between events are strengthened when the events frequently co-occur (Tversky & Kahneman, 1974, p. 1128).

In the same vein, current research in risk communication describes the “affect heuristic” as the idea that one’s affective reaction to something, the “faint whisper of emotion” or “specific quality of ‘goodness or badness’” (Slovic et al., 2004) serves as an efficient proxy for more complex cost-benefit decision-making. Throughout a lifetime of personal experiences and learning, certain concepts or images become more or less salient (i.e., positive or negative emotion-inducing) to the individual. Consequently, individuals may unknowingly use this “mental shortcut” (Slovic et al.,

2004, p. 314) when forming risk perceptions and making judgments. In this respect, having a spouse, parent, or close friend fall ill from a suspected chemical exposure factors prominently in one's own evaluation of that risk. Similarly, a lifetime's experience applying pesticides with no negative consequences can lead one to dismiss scientists, whose peer-reviewed studies often seem to suggest otherwise. Despite the highly credentialed expertise of these researchers and medical doctors, the strength of personal experience can make such evidence moot.

While no published studies to date deal particularly with commercial pesticide applicators' risk perceptions, several researchers have examined how attitudes and perceptions of agricultural workers exposed to pesticides relate to safety behaviors. (Conceivably, in many respects, this population would also fit the description of ARCs, though possibly having fewer opportunities to interact with the public.) Often working in rural settings in less developed countries, or recent immigrants to the United States, agricultural workers often recognize risks to their health and to the environment from pesticides, yet face institutional barriers, including: lack of access to personal protective equipment (PPE), inadequate training, or inability to read and/or comprehend pesticide labels (e.g., Arcury, Quandt, & Russell, 2002; Flocks, Monaghan, Albrecht, & Bahena, 2007; Halfacre-Hitchcock, McCarthy, Burkett, & Carvajal, 2006; Ibitayo, 2006; Rao, Arcury, Quandt, & Doran, 2004; Rao, Quandt, Doran, Snively, & Arcury, 2007; Recena, Caldas, Pires, & Pontes, 2006; Salazar, Napolitano, Scherer, & McCauley, 2004; Yassin, Abu Mourad, & Safi, 2002). These and other studies highlight pesticide safety education as being related to *perceived control* and, in following, enacting safe behaviors. Other studies, however, note that these educational strategies are *ineffective* unless developed directly around the beliefs, perceptions, and cultural background of the worker population (Peres, Moreira, Rodrigues, & Claudio, 2006; Rao, Quandt, Doran, Snively, & Arcury, 2007).

Interestingly, in a study of farm workers in North Carolina, Arcury, Quandt, & Russell (2002) found that providing more access to health risk information (e.g., increased safety signage) increased perceived control, yet decreased perceived risk of pesticide exposure; as the authors conclude, “Knowing one is exposed to a health hazard is important for the perception of risk, but it is not sufficient for changing behavior” (Arcury, Quandt, & Russell, 2002, p. 238). As has been stated elsewhere in the risk literature (Witte, 1994), it is important to emphasize that a decrease in perceived risk may, in some cases, emerge as an *unwanted* and *unintended* side effect of such informational campaigns. Stressing the notion that perceived control must encompass *self-efficacy*, Rao and colleagues (2007, p. 349, emphasis added) note:

Basic pesticide safety education for women in farmworker households needs to start by increasing their awareness of risk in a way that convinces them of the importance of avoiding exposure and provides them with the *means* and *motivation* to take action to protect themselves and their families.

Other studies examine the role of direct experience with pesticides on risk perceptions. In a survey of corn and soybean growers in Maryland, New York, and Pennsylvania, Lichtenberg & Zimmerman (1999) analyzed whether the personal experience of actual physical harm from pesticides is related to individual attitudes about health and environmental risks, as well as “occupational hazards” surrounding pesticide use. The authors found personal experience of adverse health impacts related to “more heightened concerns about water pollution from fertilizers and pesticides, and illness and injury from mixing, loading, and applying pesticides than farmers who have not experienced such problems” (Lichtenberg & Zimmerman, 1999, p. 283). In a study gauging public acceptance of pesticide use in Utah, Coppin, Eisenhauer, & Krannich (2002) similarly found direct, personal experience with pesticides (e.g., having applied chemicals on farms or lawns) to be more important than place of residency (urban or rural) in predicting self-reported “acceptability” of the chemicals.

Perry & Bloom (1998)'s qualitative study of American farmers noted a relationship between knowing cancer sufferers and increased perceptions of pesticide risk.

Lines of demarcation: visible and invisible risk

The ARC, or in this case, the commercial pesticide applicator's, combined technical *and* cultural rationality, coupled with significant on-the-job experience, may also lead him to formulate multiple and/or conflicting definitions of what "counts" as occupational risk. Defining these risks requires taking a step back to the science underlying quantitative risk assessment. How does one distinguish between "true" science and "false" science? Or, between science that "proves" the toxicity of an organophosphate to humans, and science that does not? In the case of pesticides and risks to human health, given the complexity of variables at play, proving that exposure to a certain chemical causes—or does not cause—a certain medical condition is difficult at best and impossible at worst. In particular, the association of illness with chronic rather than acute exposure to pesticides in manifold forms (e.g., through inhalation of fumes, dermal contact, ingestion, etc.) makes pinpointing cause and effect relationships particularly problematic. In some sense, both the risk and the chain of cause and effect are rendered invisible.⁹

In her discussion of the myriad and diffuse chemical exposures linked to late 20th century office workers' development of Sick Building Syndrome, Michelle Murphy (2006) uses the phrase "regimes of perceptibility" to describe how *seeing* "invisible" chemical exposure as causing human illness necessitated not just a scientific explanation, but also a particular alignment of political and historical

⁹ Beck's (1992) scholarship on the development of the risk concept in concert with the changes that make a "modern" industrialized society is relevant here. Importantly, Beck argues that "modern" scientific and industrial development has created a suite of hazards no longer limited in time (i.e., affecting future generations) or space (i.e., affecting people across geo-political borders). As Wynne notes (as cited in Beck, 1992, p. 2), "it is becoming impossible to compensate those whose lives have been touched by those hazards, as their very calculability becomes problematized."

conditions. As Murphy (2006, p. 59) argues, “If occupational illness was to be associated with office work, its nature defied causal specificity and the search for discrete disease entities.” Thus, in Murphy’s analysis, an unambiguous “line of demarcation” (Popper, 1992) between “Science” and everything else seemed to waver in the presence of the “dual uncertainty” intrinsic to understanding chemical exposures:

First, any incidence of chemical exposure is difficult to pinpoint, even with scientific best efforts, because of the complexity of the phenomenon itself; second, contemporary experts disagree about the import and even the existence of widespread, low-level exposures (Murphy, 2006, p. 9).

Murphy’s account tells the story of constructing a “line of demarcation,” of rendering the imperceptible perceptible, by transforming suffering from Sick Building Syndrome into having recognized expertise about the condition. Her discussion of “popular epidemiology” hinges on this idea of transformation and visibility: for example, the idea that a simple epidemiological survey, distributed among afflicted office workers, could “[change] ‘experience’ into quantitative evidence” (Murphy, 2006, p. 72).

Consider the role of the applicator’s state-mandated training in demarcating the apparent safety or risk of the chemical products he or she uses. Drawing from the principles of toxicology, such training privileges a quantitative assessment of risk, wherein the risk of pesticides to human health has been “objectively” measured via controlled trials and longitudinal studies. From a historical ontological point-of-view, as Murphy adopts, certain cultural, political, and historical conditions have merged to render this Western notion of “risk as numbers” (Slovic et al., 2004) both “perceptible” and “real.” The Environmental Protection Agency (EPA)’s decision to register a particular chemical product, followed by the standard description of the product on its MSDS and label present a transparent, steadfast picture of its scientific properties, and the human health risks that are to be expected, and thus,

“perceptible.”¹⁰ Safety measures outlined on these documents, and mandated by law, address these “real” risks in a logical, systematic manner: for every human health risk officially recognized (“seen”) by epidemiological study emerges a coupled safety technique. Implicit in these documents, as in the process of quantitative risk assessment, is the idea that scientists—those who run the trials and determine the numbers—deserve legitimacy and notoriety in evaluating what risks exist.

Risk from “expert” and “lay” vantages

On the other hand, just as risks can be interpreted from “expert” vantages, they can also be assessed from “lay” or “experienced-based” (Collins & Evans, 2002) perspectives. While many ARCs do not have degrees in science-related fields, they nonetheless deal with issues related to toxicology, engineering, biology, and chemistry, to name a few, on a regular basis. Their closeness to the risks they deal with, in fact, may lend a certain sense of credibility and expertise, regardless of a lack of formal education. The discussion of “expert” and lay (or “indigenous”) knowledge in the arena of public understanding of science (PUS) recognizes how differently stakeholders may come to understand and integrate science into daily life.

After a career spent applying chemicals on a daily basis, a CPA may develop a “working knowledge” of the risks faced: a kind of expertise founded on experience. In a highly cited case study of British sheep farmers facing contamination linked to Chernobyl fallout, Brian Wynne (1992) describes the conflict between the working knowledge of outside scientific “experts” and that of the local Cumbrian farmers. Coming head-to-head with the outside experts’ advice on how to manage their flocks to avoid contamination, the farmers “...felt their social identity as specialists within their own sphere, with its adaptive, informal cultural idiom, to be denigrated and

¹⁰ Sheila Jasanoff’s work on explicating the “boundary-defining language” used among agencies and other institutions to delineate science from policy is particularly relevant to this point. See, for example, the author’s case study of controversies surrounding carcinogen regulation (Jasanoff, 1987).

threatened” (Wynne, 1992, p. 287). Having spent generations farming the land—importantly, an area subject to its own nuclear threat from the nearby Windscale-Sellafield reactor—the farmers were uniquely situated to evaluate the risks they faced, and to act appropriately. As Collins & Evans (2002, p. 255) summarize:

The sheep farmers knew a great deal about the ecology of sheep, and about their behavior (and that of rainwater) on the fells, that was relevant to the discussion of how the sheep (and the fells) should be treated so as to minimize the impact of the contamination. Since the Windscale-Sellafield plant was built soon after World War II, the farmers in the locality had long experience in the ecology of hill sheep on (mildly radioactive) grassland, even though they had no formal qualifications.

In the same vein, Wynne’s examination of the UK government scientific Advisory Committee on the Safety of Pesticides (PAC) in the late 1970s showcases outside technical experts who ignore the “organizational realities of farm life” (Wynne, 1987, p. 287), factors that may contribute to how farmers approach the risks posed by the pesticide 2,4,5-T. Describing this tension between technical experts and on-the-ground actors, Wynne (as cited in Beck, 1992, p. 5) writes:

[Farm workers] knew from experience that ‘the correct conditions of use’ were a scientists’ fantasy — ‘Cloud-cuckoo-land from behind the laboratory bench’ as one farmers’ representative put it. The instructions for use were frequently obliterated or lost, the proper spraying equipment was often unavailable, protective clothing was often inadequate, and weather conditions were frequently ignored in the pressure to get the spraying done.

As Wynne suggests, the messy realities of farming, from uncooperative weather to inadequate equipment, serve as obstacles to adopting the safety precautions presented by the “experts.” To this end, he (1987, p. 288) points out that:

There are good reasons why farm workers spray herbicides in unsafe conditions...which are to do with the social and economic realities of farming...This apparently irresponsible activity, in the ‘periphery’ of the technological network, [is] locally logical and necessary...

While these case studies are often cited as epitomizing the concept of “lay expertise,” the ability of non-formally trained citizens to apply scientific understanding in realms familiar to them, they also exemplify the “normalization” of risk. Living and working

within a potentially toxic natural environment enables not only the know-how to manage the risk, but also, perhaps, the desensitization to its potential scale and intensity. Working with hazardous materials for a living, CPAs may face a similar situation. On the one hand, they become trained, technical “experts” in minimizing risk (e.g., through appropriate and effective use of safety equipment). On the other hand, social, economic, and other situational factors may lead to a conscious *or* unconscious disregard for these very same risks.

What are some of the challenges ARCs face?

Occupational risks

As suggested above, ARCs face significant occupational risks on a daily basis. From mixing chemicals (the CPA) to handling needles (the tattoo artist) to working around toxic fumes (the painter), ARCs accept a variety of potentially hazardous risks as part and parcel of their jobs—conditions or hazards that can, in turn, threaten their health. For example, we might reasonably expect that a CPA working in a recreational park or at a golf course might face (Duvall, 2001):

- Extreme weather conditions, leading to heat stroke or heat exhaustion. (In the winter, frostbite or hypothermia).
- Allergens or poisons, such as from vegetation or animals.
- Attacks or related physical injury from wildlife.
- Infectious diseases, such as fungal diseases in contaminated soil, or diseases carried by insects or other wildlife.
- Physical injuries, often related to lifting heavy objects or operating machinery.
- Exposure to harmful chemicals, such as from pesticides, fertilizers, gasoline, or diesel fumes.

Clearly, this example illustrates the degree to which ARCs face both *acute* and *chronic* exposures to a variety of risks. As previously discussed, the degree to which

these individuals perceive themselves as being at risk, however, may vary considerably.

Emotional management

Many ARCs hold jobs that can require face-to-face interaction with clients, a skill showcased perhaps most obviously in the service industry. When a sales clerk greets a customer, the worker may be described as displaying a particular emotion in order to “satisfy role expectations” handed down by a direct supervisor or boss (Rafaeli & Sutton, 1987, p. 26). Training manuals, workshops, and even publications created by both small businesses and large corporations disseminate these “feeling rules,” guiding employees to display certain reactions or mannerisms when in contact with clients (Rafaeli & Sutton, 1987). When one’s “personal values” and the job’s “role requirements” clash, however, the worker may be forced to “fake” an emotion, often resulting in significant psychological stress (Rafaeli & Sutton, 1987). For example, Hochschild (1983) documented the negative impact of this “management of emotions” (e.g., remaining hospitable for long hours, under adverse conditions) on the psychological health of Delta Airlines flight attendants. Arguing that these workers’ emotions have become a *commodity* purchased by the employer, Hochschild (1983, p.7) notes that a flight attendant’s “emotional labor:”

Requires one to induce or suppress feeling in order to sustain the outward countenance that produces the proper state of mind in others—in this case, the sense of being cared for in a convivial and safe place. This kind of labor calls for a coordination of mind and feeling, and it sometimes draws on a source of self that we honor as deep and integral to our individuality.

As the face of a national lawn care company or thriving local business, an ARC must fulfill the service expectations of his employer, as well as the health and safety protocols of state and federal regulatory agencies, all balanced against his own (possibly) conflicted feelings about the risk he or she faces. By managing these emotions to meet obligations posed by a boss, a NYS DEC official, a customer, or

even a curious spectator, the ARC joins a cadre of what Hochschild (1983, p.153) calls “emotional laborers,” a class of workers who, “make possible a public life in which millions of people daily have fairly trusting and pleasant transactions with total or nearly total strangers.” In essence, ARCs may be “professionals” not just by virtue of the jobs they perform, but also by the words and emotions they choose to display while completing these tasks.

Workplace culture

In many cases, employees (whether flight attendants or pesticide applicators) must ascribe to certain norms dictating the ways in which they communicate with others and display their emotions. Ashforth & Humphrey (1993, p. 92) note that “occupational communities and organizations” forward “display rules that are more localized and specific than the societal norms” whether through formal training materials, workshops, or seminars, or through informal conversation or observed behaviors between supervisors and staff. Whether spoken or unspoken, there are undoubtedly certain expectations, rules, traditions, and so on that ARCs must navigate in their workplace. For example, a supervisor may encourage employees to ask questions, wear protective clothing, speak openly with clients, or take advantage of continuing education courses. Regardless of the organization’s formal policy, the attitudes and behaviors of co-workers can also greatly influence the ARC.

Risk and stigma

In many cases, ARCs may perform tasks that induce societal stigma. Research in risk communication has documented the social, psychological, and cultural impacts of stigma on both individuals and communities linked to “dreaded” risks, such as hazardous waste, nuclear power, and genetically modified organisms (Gregory, Flynn, & Slovic, 1995; Gregory & Satterfield, 2002). Gregory & Satterfield (2002) suggest

that natural resource-based communities, once esteemed, now face negative reactions from outsiders. As the authors note:

This positive image largely has been overturned, replaced by the idea of loggers, miners, and those who fish commercially not as provisioners of goods that the public relies on and readily consumes but as *stigmatized agents* responsible for clearcut-defaced forests, mining-scarred hillsides and streambeds, or extinct salmon runs (Gregory & Satterfield, 2002, p. 348, emphasis added).

For some ARCs, fear of judgment or confrontation with hostile communities may affect communication behavior.

Research questions

Working from the review of pertinent literature pertinent just presented, I now pose the questions that guided this research. The present study adhered to a grounded theory approach (Glaser & Strauss, 1967; Charmaz, 2001) in which data was collected through in-depth interviews with two purposive samples: 1) CPAs in the turf and lawn-care industry in New York, and 2) a mixed group of professionals with backgrounds in pesticide safety education, the turf/lawn care and pest control industries, and pesticide-related research (e.g., turf science, environmental toxicology). The following research questions were explored:

- **RQ 1:** How do CPAs perceive their job? That is, how do they make sense of the role they (do or do not) play in delivering risk-related information?
- **RQ 2:** How do CPAs make decisions about *when*, *what*, and *how* to communicate with their clients and the general public about pesticide-related risks? And, what factors contribute to this decision-making process?
- **RQ 3:** How do CPAs perceive, evaluate, and position pesticide-based risks? Namely, what are the dominant stories and themes used to characterize, make sense of, and discuss pesticide-related risks?

Chapter Three discusses the research methods employed in this study to answer these questions.

CHAPTER 3.

METHODS

Having outlined the research questions in the previous chapter, this chapter provides background on qualitative research and grounded theory in terms of theory development. More specifically, I will discuss in detail the methods employed for the present study, including in-depth interviews and a written questionnaire. Issues of validity, researcher values, and ethics are also considered at the end of the chapter.

Qualitative research

Qualitative research encompasses a variety of “interactive” and “humanistic” methods, often in a “natural setting” such as the respondent’s home or workplace (Creswell, 2003, p. 181). In many cases, qualitative research is interpretivist, in that data analysis includes the values and biases of the researcher and is situated in a particular cultural and historical context (Creswell, 2003; Lin, 1998). As such, reflexivity of the researcher becomes central to the study (Creswell, 2003), and themes from the data are viewed as “emergent rather than tightly prefigured” (Creswell, 2003, p. 181). In other cases, qualitative research may take a more positivist approach (Lin, 1998); the degree to which either approach is followed has repercussions for the generalizability of the results. A qualitative study may cycle back and forth between inductive and deductive inquiry in an iterative fashion (Creswell, 2003).

In-depth interviews

Before conducting interviews, all protocols were reviewed and approved by the Cornell University Committee on Human Subjects to be in compliance with federal requirements (Appendix A provides an example of the informed consent used with all participants in this study). The design of the protocol followed Rubin & Rubin (1995)’s conception of a “tree and branch” design, as several subject areas were treated with “more or less the same degree of depth” (Rubin & Rubin, 1995, p. 159).

Each area included between two and three main questions, with an additional two to three follow-up questions each as well as potential probes (See Appendix B). At each interview, I gained voluntary informed consent from the participants to record the session. Following the interview, a debriefing discussion allowed respondents to ask questions and react to the experience (Sieber, 1998). During the 29 interviews conducted in June-November 2007, the interview format often shifted to follow a “river and channel” (Rubin & Rubin, 1995) approach; I would follow alternative directions or “channels” as appropriate, based on “markers” (Weiss, 1994) I perceived as referring to “important events or feeling states” (Weiss, 1994, p. 77). Throughout these interviews, which ranged from 20 minutes to an hour and a half, with an average length of 41 minutes, I avoided dichotomous (yes/no) questions, instead using open-ended questions. Due to geographic constraints, seven out of the 29 interviews were conducted on the telephone. When possible, I gave appropriate verbal feedback (e.g., “mmmhmmm”, “I understand”) and non-verbal cues (e.g., leaning forward in my chair, tilting my head) (Patton, 2002) and resisted offering personal opinion or judgment.

Study sample

This research viewed potential respondents as stakeholders in a “loose collectivity” (Weiss, 1994, p.19): related in a broad network, though not necessarily in close contact either interpersonally or professionally. As such, respondents were sampled from a variety of occupations that deal with pesticide and risk communication issues and the so-called “Green Industry” in general, including: researchers, regulators, educators, and practitioners. The term “Green Industry” is generally understood as encompassing the “environmental horticulture industry” and serves as an umbrella term for “a variety of businesses involved in production, distribution and service associated with ornamental plants, landscape and garden supplies and

equipment” (Hall, Hodges, & Haydu, 2005, p. 1). Industry segments include (but are not limited to): lawn care and maintenance, tree care (arborculture), landscape design and maintenance, pest control, commercial greenhouse and sod production, and golf course maintenance. Besides commercial sectors, the Green Industry also encompasses state and local governments through the maintenance of parks, botanic gardens, and community right-of-ways. (Note that “Green Industry,” in this sense of the term, should not be confused with the reference to the growing sector of jobs related to environmental sustainability, or so-called “green technology”).

In May 2007, after attending a pesticide applicator certification orientation at Cornell University, I was introduced to several university employees I viewed as “key informants” (Lofland, Snow, Anderson, & Lofland, 2006) in the study. Once identified, the individual was contacted via email, letter, or phone call (or sometimes, a combination of the three), informed of the nature of the study, and invited to participate in an interview at his or her convenience (see Appendices C and D). In order to locate local businesses, I relied upon online commerce directories and Yellow Pages listings as well as, in some cases, word of mouth. Additionally, the membership directory of the New York State Turfgrass Association (NYSTA) served as another resource for identifying possible respondents in the central New York region. From each individual interviewed, I elicited the names of other people who might be qualified and willing to participate in an interview (Weiss, 1994). Through this process of “snowball sampling,” each subsequent respondent was asked for a list of referrals to other potential respondents in the population. Between May and November 2007, I completed 29 in-depth interviews:

- 2 individuals were connected to the regulatory and/or independent environmental/risk consulting realms.

- 10 individuals were connected to a university and/or the Cooperative Extension system. Individuals held positions in pesticide safety and management education, as well as groundskeeping and maintenance of other university-owned natural areas. The majority had some responsibility in either training applicators and/or designing training materials for university or state-mandated curricula.
- 5 individuals owned and/or managed turf/lawn care businesses. Three individuals represented local, central New York based businesses, while two individuals worked for national firms with offices throughout the US and Canada.
- 9 individuals were classified as “certified pesticide applicators.”¹¹ These individuals worked in a variety of settings, from school districts to university-owned natural areas, to private home lawns.
- 3 individuals were connected to the indoor (also referred to as “structural”) pest control industry. These individuals held higher-level management-type positions in medium-sized regionally based US businesses and had experience training new applicators.

While several respondents could have been conceivably grouped into more than one “category,” for the purposes of simplicity, one category was chosen for each. It is worth noting, too, the relative dearth of respondents representing the nationwide commercial turf/lawn care industry in this study. After repeated attempts to speak with employees at the regional branch of a well-known nationwide commercial firm, I was repeatedly referred to managers, public relations personnel, and other higher-ranking officials in the company, often out-of-state. While I eventually secured one (unrecorded) interview with a regional technical manager of a branch in the Midwest

¹¹ It should be noted that all of the individuals in the previous three categories (with the exception of one individual) also had significant experience applying, working around, and otherwise dealing with turf/lawn pesticides. Several individuals had held jobs, and/or grew up with a family business related to the Green Industry. Additionally, several of the business owners also applied pesticides themselves on a somewhat regular basis.

(Indiana), multiple phone calls to the equivalent individual in the Northeast as well as the company's toxicologist/risk advisor went unreturned.

Impromptu interviews were also conducted with certified pesticide applicators at the Empire State Green Industry Show in Rochester, NY on November 14, 2007. These conversations took place throughout the day, outside of a visual poster display advertising the research and inviting CPA conference-goers to share their experiences of communicating with the public. Due to the setting, a bustling conference center, as well as the nature of the event, all but three of these "interviews" could *not* be recorded; however, they served the purpose of validating other data collected. By permission of Ms. Elizabeth Seme, Executive Director of NYSTA, the sponsor of the event, short written surveys with four free-response questions were distributed to about 30 applicators attending the conference; these individuals were recruited by word-of-mouth as they passed by the poster display in the conference center, and rewarded with a small token of candy. The questions were selected to cover the major thematic areas covered in the in-depth interviews (see Appendix E). Completed surveys were collected from 24 participants who, like the interviewees, represented a variety of occupations within the Green Industry. According to self-reports on the surveys:

- 8 individuals represented a local landscape, garden, or tree care company.
- 1 individual represented a statewide or regional landscape, lawn, garden, or tree care company.
- 3 individuals represented a nationwide commercial landscape, lawn, garden, or tree care company.
- 2 individuals represented municipal county parks and/or recreation departments.
- 4 individuals represented university or college grounds departments.
- 5 individuals represented elementary or secondary school districts.

- 1 individual identified as an arborist.

Written answers were typed and, like the interviews, coded for relevant themes (see *Data Analysis*).

Grounded theory

This study adopted a grounded theory approach to qualitative data analysis (Glaser & Strauss, 1967). Grounded theory was conceived of in reaction to the traditional logico-deductive model of theory testing and development (Glaser & Straus, 1967). Working in opposition to the then-standard paradigm in sociology, the researchers argued that applying a more inductive, empirical approach to theory development could inevitably generate “theory suited to its supposed uses” (Glaser & Strauss, 1967, p. 3). By staying close to the data, the authors posited that they could avoid “forcibly” applying preconceived concepts and a priori assumptions to their research. In general, their approach privileges theory “emerging” from field observations over the highly cited, so-called “great man theories” of Weber, Durkheim, and others (Glaser & Strauss, 1967). In no uncertain terms, the authors proclaim the strength of the grounded theory approach as its commitment to the data as the primary (and often, sole) source of inspiration for theory development.

By starting in the substantive realm, a grounded theory study follows Brinberg & McGrath’s (1982) “empirical path” (“Path C”) of research, in that the researcher begins with the data and applies meaning only towards the end of the research process. The researcher’s *primary* responsibility is thus “explaining a data set by constructing it in terms of a set of concepts” (Brinberg & McGrath, 1982, p. 8)—concepts that may or may not fit neatly within the pre-existing literature. As a *secondary* responsibility, following data collection and analysis, the researcher must address *explanatory validity*; according to Brinberg & McGrath (1982), this involves addressing the

question, “Are there alternative conceptual explanations for what is being observed?” (Further discussion on validity follows at the end of this chapter.)

Data analysis

Approaching the transcript line-by-line, I used “in-vivo” (i.e., the words of the respondents) and descriptive codes, rather than a theoretical lens to organize and analyze the data (Charmaz, 2001). By remaining “close to the data,” I hoped to resist imposing my own “motives, fears, or unresolved personal issues” (Charmaz, 2001, p. 342) onto the data. After several run-throughs of line-by-line coding, I classified codes into related or opposing groups. I also employed memo writing to flesh out themes, moving from the individual to the general level (Charmaz, 2001). During this process, I used informal diagrams, typologies, and concept charts to organize themes, and to understand the *process* by which a phenomenon might be occurring (Lofland et al., 2006).

To aid in this process, after first coding by hand, I subsequently used the qualitative data analysis software, Atlas.ti (developed by Scientific Software, <http://www.atlasti.de>), one of several software packages used by qualitative researchers to analyze interview data. Atlas.ti enables systematic analysis of text, image, audio, and video files, allowing researchers to more easily categorize, sort, and provide descriptive codes for a wide range of data (Creswell & Maietta, 2002). Users can also write memos, insert labels, and create visual depictions of relationships between codes, memos and/or freestanding quotations to aid in conceptual or theoretical development. Using this program, I imported typed transcripts of the interviews, as well as the typed questionnaire responses and coded each electronically. In this way, I re-assessed (in some cases, changing) the codes I had previously developed and recorded by hand. Using the software functions, I then merged and compiled quotations applying to each code, later exporting the created document into word processing software. I also used

Atlas.ti to create diagrammatic concept charts illustrating the interrelationships of codes; these visual displays helped me to determine the organizational structure for the Results & Discussion chapter.

Role of the researcher

The principles of grounded theory involve integrating the researcher's current knowledge and experience into making sense of the data (Charmaz, 2001). As Helen Longino (1996) and other feminist theorists have shown, such values inescapably shape the entire process of research, from the type of questions the researcher asks, to the observations she reports and analyzes. Arguing that these "contextual values" do not threaten the "constitutive values" determining the practice of science, Longino (1996) instead posits that one can make explicit value commitments and still produce "good science." By laying claim to the contextual values at play, Glaser & Strauss (1967) would argue that the grounded theory researcher does not jeopardize the validity inherent in the cataloguing of the "emergent" themes that constitute the data set.

In regard to the present study, what "contextual values" (Longino, 1996) might I have anticipated as creating potential biases or, perhaps, as limiting my credibility among the respondents? Moreover, should I have obscured these values, such as my educational background and environmentalist tendencies, or have made them transparent to the respondents? Beyond just "getting in" to a particular research setting or forging particular relationships. Young (2004) stresses that the researcher must take pains to consider how he or she is perceived by her respondents—as outsider, insider, or perhaps, both.

At first glance, it may appear easy to practice reflexive, self-aware research: simply own up to the biases you bring to the research and, in turn, your transparency will foster greater trust from your respondents. In practice, however, I found even the most "superficial" decisions within the research process to be less than straightforward:

Do I wear the frayed Carhartt pants to my interviews with pesticide applicators (to indicate my willingness/ability to do physical work and my “down to earth” demeanor) or my pressed khakis (to suggest I am a credible, reliable researcher and student)? Decisions such as dress may seem frivolous, or even representative of an over-analytical neurosis, but can influence both the way in which the researcher is perceived, as well as the responses elicited.

Many qualitative methodologists advise against self-disclosure (e.g., Weiss, 1994), with the thought that so doing re-directs attention *away* from the respondent; however, certain well-timed and appropriate “slips” may also gain both the attention and respect of respondents. In many cases, I deliberately tried to connect with participants on a more personal level—for instance, by making conversation about a common affiliation (e.g., Cornell University), or a relevant current event (e.g., the Red Sox’s 2007 World Series victory). Given my background, I could clearly not hope to achieve complete “insider” status (Lofland et al., 2006) among a group of seasoned pesticide applicators, or even university educators. Within the interviews I did, however, try to establish some semblance of common ground with my respondents; David Turnbull (1997) refers to this as the “interstitial space”—a setting in which “knowledge traditions can be performed together” (561).

Validity

While qualitative studies generally deal less with reliability and generalizability (Creswell, 2003), validity was nonetheless maintained in a variety of ways throughout this study. Though researchers cannot be certain of whether a respondent is telling the truth, by eliciting descriptive narratives of concrete events, Weiss (1994) suggests that researchers are more likely to generate “trustworthy” material from their respondents that is less influenced by the context of the interview. Ultimately, the craft of the researcher, plus a respectful partnership with the

respondent determines the validity of qualitative findings (Weiss, 1994). In order to forge trusting relationships, wherever possible, I used references and introductions from constituents, rather than simply “cold calls.” Getting into the field, whether by attending the Empire State Green Industry Show or visiting a local lawn care firm, helped me form a more multidimensional picture of both my respondents and the Green Industry more generally. Dealing deliberately with potential “researcher bias” (as addressed above), as well as using “thick, rich description” to characterize events, people, and experiences also contributed to this study’s validity (Creswell, 2003).

Though I used descriptive coding to interpret my interviews, I also remained connected to the academic dialogue surrounding the possible theoretical applications of this study; as Lofland, Anderson, Snow, & Lofland (2003, p. 195) caution, “much, and perhaps most, qualitative fieldwork findings of some theoretical or conceptual significance are not so much novel discoveries as they are ‘extensions’ or ‘refinements’ of existing work.” Since the present study draws considerable backing from the risk communication and S&TS literatures, understanding the theoretical arguments, as well as areas of contention and accord among researchers in these fields, was critical. Besides being cognizant of the literature, I also consulted with professionals in the turf and lawn-care industry (e.g., Dr. Frank Rossi, Extension turf-grass specialist at Cornell), as well as researchers with particular experience studying this target population (e.g., Dr. Heather Clark at Cornell’s BCERF) for guidance in developing the preliminary interview protocol. This regular interaction with both the theoretical and substantive realms served both to “ground” the research and direct relevant theory development in line with the thinking of Glaser & Strauss (1967).

Generalizability

Because some qualitative studies stress targeting those populations directly affected by something (e.g., a new cancer treatment, or a particular art exhibit), in

practice, researchers may have less flexibility in choosing participants and often select a *purposive* (rather than random) sample from within a narrow population. The time and resource-intensive nature of the interviewing process also usually translates to a *smaller* population size, a phenomenon often attributed to qualitative research and referred to (often disparagingly) as “N of 1” studies. In light of these facts, some researchers (e.g., Berkowitz & Donnerstein, 1982) might caution against assuming a high degree of external validity just because of the designation of “field study.” Such researchers would argue that qualitative methods can fail to “get at” the more critical *causal relationships* or *mechanisms* underlying these witnessed words or behaviors.

While the present study relied upon the assumption that commercial pesticide applicators in the turf and lawn-care industry are “representative” of the ARC designation, its findings may support future boundary searches of just *who* may be included in this group. The process of extending the present study beyond its limited substantive focus would also broaden its applied perspective to be more applicable to the wider realm of communication scholarship. As previously noted, the lack of attention in the risk communication literature to *informal* communicators, especially those in daily contact with heterogeneous public audiences by nature of their occupation, suggests a need for more organized attention and study. By turning our attention to other purposive samples of ARCs (e.g., auto mechanics, tanning salon owners, etc.), we may begin to build a more substantial and nuanced theoretical frame with which to understand this group. Besides contributing to the literature and, the outcome of this and related studies may also be useful to policymakers. For example, because the state of New York contracts Cornell University to manage the state’s pesticide sales and use registry, educational programs, and pesticide applicator certification, study findings could inform the format of trainings, or pose alterations to the content of posted warning signs and pesticide labels. Studies of this and other

ARC groups could likewise clarify how occupational workers play distinctive roles in the process of public understanding of risk, contributing both intentional and unintentional risk messages to larger audiences. (These and other practical applications of this work will be considered more extensively in the Conclusion chapter.)

Ethical issues

As previously discussed, the goals of this study are two-fold: to contribute to the risk communication literature, and, by extension, to contribute to recommendations on how risk communication efforts by ARCs (in particular, turf and lawn care workers in New York) with the public can be improved. In the case of the latter goal, it is important to recognize the ethical concerns a researcher may introduce by making these pronouncements. For example, Guttman & Ressler (2001) note that the ubiquitous and commonplace appeal to the personal responsibility of the individual in many health-oriented campaigns can lead to “potentially paradoxical consequences” (p. 117), such as feelings of fatalism or shame, and ultimately, campaign failure. In terms of the present study, Guttman & Ressler’s (2001) discussion of *agency*, that is, the notion that, “the individual is both self-aware and in possession of the necessary means to cause an event or action and is free not to engage in actions deemed potentially hazardous”(p. 130) seems particularly relevant. Consider, for example, a lawn-care worker who fears the possible negative health impacts of pesticides on children, yet feels compelled by virtue of losing his job to keep quiet around an inquiring parent; in this case, the issue of job security would render a campaign directing workers to openly discuss pesticide-related health risks with their clients both ineffective and unethical. In the larger scheme of the research (beyond the scope of the present study), involving both turf and lawn-care workers, their supervisors, and even community officials and law-makers in discussion would be necessary to craft a campaign that avoided the

aforementioned ethical pitfall. In other words, campaigns must do more than educate, but also provide the “opportunities” and the “tools” (Guttman & Ressler, 2001) for the audience to make informed decisions about the topic.

Having presented an introduction to the case study, related literature, and methods utilized, I now turn to the results of the study. The following chapter, Chapter Four, provides both data and related analysis.

CHAPTER 4:

RESULTS & DISCUSSION

Overview

To review, the research questions were:

- **RQ 1:** How do CPAs perceive their job? That is, how do they make sense of the role they (do or do not) play in delivering risk-related information?
- **RQ 2:** How do CPAs make decisions about *when*, *what*, and *how* to communicate with their clients and the general public about pesticide-related risks? And, what factors contribute to this decision-making process?
- **RQ 3:** How do CPAs perceive, evaluate, and position pesticide-based risks? Namely, what are the dominant stories and themes used to characterize, make sense of, and discuss pesticide-related risks?

Addressing the first research question entailed breaking it into its component conceptual pieces. First, determining how CPAs perceive their job required a clearer understanding of the institutional culture in which they work. Second, determining what traits and skills define a “successful applicator” in the eyes of the respondents provided insight into job perception. Third, asking respondents to describe their jobs shed light on whether “risk communication” was seen as part and parcel of the job. Research questions two and three are more simply mapped onto parts four and five of the chapter. In sum, this chapter is organized as follows:

- Part 1: Institutional culture (RQ 1)
- Part 2: The “successful” applicator (RQ 1)
- Part 3: Job perceptions and the role of the applicator (RQ 1)
- Part 4: Communication with clients and the public (RQ 2)
- Part 5: Perceptions of risk and “Western science” (RQ 3)

This chapter provides data in each of these areas, as well as accompanying discussion. Using a grounded theory approach to the development of themes, this chapter outlines the grammars of practice in relation to risk communicative behaviors in pesticide applicators, and suggests extensions to ARCs in general. While I have presented the most commonly heard emergent themes, I also included a number of other less widespread themes for the sake of interest and comparison; the degree to which a particular theme was “commonly heard” (i.e., “representative”) is indicated within the text. While the in-depth interviews provided rich description in even more areas than those listed above, the information included in this chapter deals with results viewed as central to the development of this thesis.

In the following chapter, respondents directly quoted are identified according to their generic affiliation (e.g., “pesticide safety educator,” “regional manager of a lawn care firm”). Most quotations are taken from interviews; when quoted, questionnaire responses are specifically labeled as such in the text. No proper names or specific locations will be used.

Part 1: Institutional culture

“...The faster I go, the less I can think.”
-Pesticide safety educator commenting on the work culture at many commercial firms

The occupational cultures that respondents inhabited varied considerably; for example, the private landscaper who is self-employed and chooses his own hours faces decidedly different constraints than the commercial pesticide applicator, who is contracted by a national firm and works a set 9 to 5. Depending on these conditions, respondents found support for their daily challenges in a variety of positions: direct supervisors, bosses, or even administrative assistants. Accordingly, institutional culture seemed to work to support the applicator (at best) or prevent him (at worst)

from fulfilling occupational tasks. The following discussion explores how respondents discussed characteristics of their individual employers, as well as trademarks of the Green Industry in general, as both helping and hindering their job performance.

Philosophy of the institution

Time constraints and “taking the time”

Depending on the institution, the applicator has a varying amount of time allotted in the day to spend speaking with customers, the public, etc. The pressure to complete a certain number of applications, for example, may infringe on the ability to address extemporaneous questions or impromptu concerns from a neighbor. One orchard worker, also a private landscaper, described commercial applicators as, “...On a number game... If they don’t sell so many products a day, they get fired. Plain and simple. [They’re] not hitting [industry] quotas.”

In general, university workers expressed more strongly the importance of “taking the time” to address questions and concerns; simultaneously, they acknowledged that the flexibility of their schedules was unique. Several university pesticide educators stressed that applicators should do more than simply distribute risk-related information, an element of what they saw as risk communication, a theme that will be developed more completely in parts three and four of this chapter.

Suggesting that applicators owe their public(s) more than just pieces of paper, one university health & safety officer argued:

...You can’t just hand somebody an MSDS and a label and say, ‘Here you go’ and walk away. You need to say, ‘Here’s the label, here’s the MSDS... this is my card...if you have more concerns... maybe you should talk to [name of supervisor].’

“Taking the time” thus appears to put a human face on an otherwise impersonal communication, a central factor in establishing trust between the public and the applicator.

Yet, despite their appeal to the applicator to slow down, university-affiliated

respondents nonetheless seemed to appreciate the difficulty (if not impossibility) of making this suggestion a reality. Speaking from the point of view of a commercial applicator, one pesticide safety educator described how these individuals must balance demands of customers with institutional and even legal imperatives. For example, if the applicator just “shrugs off” a member of the public, problems will ensue, yet, if he “[spends] all the time this guys wants” he might risk being fired. Moreover, applicators must also take into account the weather conditions:

... Maybe...[the applicator] wants to get as many lawns done today because it's a nice calm, still day and tomorrow's got 20 mph wind and if [he] spends all day today talking to this guy, then [he's] spraying tomorrow.

As implied by this comment, issues like drift can both endanger their own and their clients' health, as well as the physical environment around them. “Taking the time” thus seems to involve considering both real and perceived risks, and attempting to balance these with the demands of bosses and the letter of the law.

Seasonality/turnover

Several respondents described seasonality as a defining characteristic of the turf and lawn care industry in general. To explain this phenomenon, one respondent, a pesticide safety educator, summed up, “The hours are killers, the pay's not all that good, [and] the chance for advancement is limited.” In the Northeast, jobs dry up as winter approaches, forcing many workers to switch to an alternative occupation, such as snow removal or construction. Other CPAs are students, working an isolated summer or two in the Green Industry to earn extra cash. The implication of this turnover, at least in the view of several respondents, was that most applicators are prevented from developing the kind of in-depth knowledge that may be required to answer the public's questions. As one respondent, an owner of a regional branch of a national lawn care firm, summed up his situation:

[Applicators] may be with you a year and there's no way you're gonna be able to give 'em all the information...so you try to just give them some basic, basic

stuff.

Owners may decide not to invest in extra training sessions, knowing that the personnel may change in a matter of months. In sum, a pesticide safety educator remarked, "...[with] these higher rates of turnover, you can't have knowledge if they don't stay and get the experience!" (Further discussion on applicators' training will be provided toward the end of this section.)

Communication with clients

Several respondents discussed passing risk-related information from the institution to the client in a written form, such as on bills and in newsletters. The majority seemed to feel that these forms of communication—in particular, those unique to the company rather than the mandated labels or MSDSs—were both expected and appreciated by their clients. One owner/manager of a regional branch of a national lawn care firm described using monthly newsletters as a repository for relevant information from diverse sources, whether from university studies, or his own observations on "what kind of problems are happening in the field." He emphasized, "I'm always bombarding my people with a lot of technical information from trade journals that I copy and pass on to them." Similarly, a manager of a regional branch of an indoor pest control firm noted that his company's "client bulletins" provide consumers information on "the behavior and the biology of the pest itself" as well as an explanation of "what [the company] is going to do...what we need [the customer] to do, and then...what to expect, and what's going to happen."

In each case, these forms of written communication seemed to provide not just substantive information, but also an appeal to the psychological—the feelings and reactions of the clients to the services rendered. Moreover, by using these written resources, both indoor pest control and turf/lawn companies seemed to be indicating to

their customers that they are paying for, as one pesticide safety educator put it, “a service that includes communication, not just the physical work.”

Support system

A handful of respondents noted that phone operators (also known as client relations personnel, receptionists, etc.) play a crucial role in the Green Industry. By serving as the “first line of communication” with the public, these individuals often have years of experience answering similar questions. As one pesticide safety educator noted, these individuals, rather than the applicators, are often those faced with urgent health and safety concerns of the public. He mimicked a stereotypical concerned caller on the line, suggesting that the individual would offer comments like:

Is this going to hurt my kids?; I’m pregnant; My dog...; I’ve got kittens; I’ve got a pool; Oh man, I’ve got worms all over!

This respondent stressed that these concerns and others are often addressed right on the phone, without the intervention of an applicator or supervisor, let alone a home visit.

While many phone operators have completed, or are encouraged to complete, pesticide applicator training courses or other related coursework, the degree to which the training of these individuals is regulated seemed to vary, especially between the turf/lawn care and indoor pest control industries. Given their job requirements, formal and informal training, as well as on-the-job experience, phone operators, like applicators, would appear to fit the ARC classification. Based on the interviews in this study, the indoor pest control industry seemed to have a more developed system in place for preparing these individuals to answer health and safety questions; however, the size of the institution (e.g., local firm or national chain) also seemed to dictate the formality of this role. One manager/trainer at a national indoor pest control firm described the “rehearsed” nature of addressing a customer’s question, noting that phone operators are trained to tell concerned customers:

... ‘There are no specific warnings on the label for this product, about the situation you’re describing. What I could do is I could send a copy of the label and the Material Safety Data Sheet to your doctor and let you consult your doctor on this. Would that be of interest to you?’

Another manager of an indoor pest control firm noted that “service coordinators” (another term for phone operators) receive an adjustment in pay after completing an educational safety course.

Beyond taking classes, spending time “in the field”—that is, completing the day-to-day tasks an average applicator does— was also seen as an important, though overlooked, aspect of training phone operators. One pesticide safety educator suggested that phone operators should be allowed to spend a day “shadowing” an applicator: “pulling hose, spraying a yard...[riding] the machine...[running] the equipment...[talking] to the customer.” This respondent felt that, by experiencing the applicator’s job firsthand, phone operators might reach a richer understanding of, for example, “why some customers get mad when fertilizers with chemicals are left all over the sidewalk,” yet, likewise, how easy it might be for an applicator to “blow off” cleaning up that spill. Such balanced understanding, in turn, might strengthen the phone operator’s ability to serve as a risk communicator, thus fulfilling the task of an ARC. (A discussion of the meaning of “risk communication” as a job description follows in the third part of this chapter.)

Relationship with clients/institutional pride

For the small business owners interviewed in this study, relationships with customers and a close-knit, family-oriented business atmosphere seemed particularly important. In these cases, respondents seemed to suggest that this intimate knowledge of their clients inspired both care (on their part) and trust (on the part of their clients). As one former landscaper noted, “... always whatever the re-entry is for the homeowner purpose, I usually double it, just in case...they’re my customers. I care for them.” Similarly, in explaining why he might not receive as many questions as other

applicators, another landscaper said, “Most of my customers I’ve known for years and years, so it’s not like some salesman’s just knocked on their door and said, ‘I want to put chemicals on your lawn.’ So I may not get the same level of questioning that others might.” Interestingly, the discussion of having close relationships with clients often segued into the history of the particular small business, or one’s personal relationship to the employer/institution. Two university grounds workers expressed considerable pride in their workplace, and a certain sense of ownership seemed to permeate their discussion of their daily work. One of these individuals, an alumnus of the institution employing him, argued, “...this isn’t just a *job*...*this is our lawn. This is our garden* here...and I’m gonna do whatever it takes to make it special.” Continuing, this respondent noted that the job placed him and his colleagues under considerable scrutiny: “In central [campus] you can’t spit without hitting a vice president or a dean.” Yet, despite—or, perhaps, because of—the visibility of his job, the respondent ultimately concluded, “I give up a big part of my life to be here and I’d better take a lot of pride in what I’m doing.” (Further discussion on the “invisible” or “visible” nature of the applicator’s job will be provided in part three of this chapter.)

Methods of training

Experience-based or informal

Several respondents noted the importance of experience-based or informal training, apart from the training received in the state-mandated applicator training. Whether working underneath an already-licensed applicator, taking part in “teachable moments” in the field, or discussing problems with co-workers back at the office, many respondents received a large degree of their training outside of a “formal” setting. One university groundsperson explained the process of relating substantive information to real-life settings:

...[An apprentice and I] will be spraying side-by-side...and [I’ll] ask [him], ‘What kind of plant is this?’ ... ‘Well, it’s an *amelanchier* and *amelanchier*

have water sprouts that come out of the roots. So what's that mean? You don't spray them!'

Thus, the ability to learn from others, or directly under others' supervision or authority was crucial not just in a legal sense but also in a developmental and educational sense.

Non-state mandated training

In addition to learning in the field, many applicators also receive more formal training sessions sponsored by their employers. Justifying the need for this continuing education in the turf/lawn care industry on the basis that most applicators are just (in his words) "everyday people looking for work" one pesticide safety educator continued:

...[It's] gonna take more than one day to show them how to mow, spray, or whatever... This is an investment in people, which means things like having...a program, and having some of the employees actually do the program.

Many institutions supply this additional training in the form of in-house workshops and seminars, as well as attendance at outside conferences; the majority of respondents discussed these events as contributing to substantive knowledge of pest control, equipment, and biological and toxicological principles. University employees often adhere to stricter university policy regarding safety training and policies, above and beyond state rules. (For example, at one university, all applicators who use respirators to apply pesticides must pass a health exam and a "respirator-fit test.")

While most training was described as mandatory, a few respondents suggested that "optional" training opportunities were available, and often with added perks; one respondent, an indoor pest control company manager, noted that completing an outside course on pest control principles would earn an employee an extra \$1000-1200 annually. Interestingly, two of the indoor pest control professionals interviewed, as well as one regional lawn care company manager, also mentioned in-house trainings covering topics such as communication and "people skills." One indoor pest control

manager explained this training as an unlikely mix of cordiality, common sense, and persuasion, and ultimately as a way to keep customers. For example, he noted that, “We tell our clients that it’s very, very important to use their customers’ names and to insist that their customers use *their* names...[because] your customer is less likely to fire you for the cheaper business” if he has developed that sort of psychological connection to a hired worker. Moreover, this respondent described teaching his employees to “say yes” to customer needs—a rhetorical technique employed to give the impression of putting the employee’s concerns first. He explained:

...We try to teach our technicians not to say flat ‘no’s but to try to find a different way, kind of a positive way of saying, ‘That is important to me, and I’m gonna try to take care of it as soon as I can.’

Further discussion on this idea of “getting in step with” customers’ concerns will be addressed in part three of this chapter.

Information-seeking

When faced with a question about a particular product, a method being used, a health concern, etc. to what (or to whom) does the applicator refer? While specific questions of information seeking are beyond the scope of this study, it is nevertheless important to address how an employee’s institution might direct and/or limit his access to certain types of information.

Given their variety of backgrounds, respondents were far from agreement on the particular source (or sources) most trusted or utilized for this purpose. Generally speaking, the sources mentioned fell into six general categories: university Cooperative Extension, government, non-governmental organization (NGO), Internet/print media, pesticide manufacturer, and other individuals. (See Appendix F for representative quotations in each category).

Having explored the institutional norms, rules, and expectations they face in the workplace, I now investigate how applicators, themselves, view the personal

attributes and cultivated skills that contribute to “job success.” Part two of this chapter explores how respondents characterized a hypothetical “successful” applicator, in terms of both disposition and skill.

Part 2: The “successful” applicator

“You have to be level-headed, you can’t... fly off the handle if somebody asks you a question even if you don’t think it’s a very intelligent question. Because a lot of people... they don’t deal in facts, they just deal in emotion. So part of dealing with that is, you have to have a good demeanor, you have to be calm yourself.”

-University groundsperson

When asked to describe the skills and traits characteristic of a “successful” applicator, respondents overwhelmingly rejected a “Marlboro Man” image of an applicator working in isolation from the public around him. Unlike the image described in the beginning of this thesis, the applicator characterized by respondents was more likely to have considerable interpersonal communication skills. Successful applicators were also distinguished as honest, detail-oriented, self-motivated, and career-driven; while these traits might appear to focus on the individualistic nature of the applicator, other respondents described applicators as outgoing leaders, able to work with a diversity of coworkers, clients, and members of the public. By including these particular traits and skills, respondents painted the image of a successful applicator as well versed in logistical thinking and planning, as well as in “emotional labor” (Hochschild, 1983). While the following discussion presents the most often reported traits and skills, the subsequent part of this chapter more deeply explores the role expectations attached to these attributes.

Applicator traits

Several respondents noted that an applicator must be willing to accept the possibility of encountering risk—whether from an accidental acute exposure to pesticides, or a lifetime’s worth of chronic exposure to toxic chemicals. As one university groundsperson stated:

... You really have to know what you're spraying and all of the side effects and then you really have to ask some serious questions ... Is it worth it to work here?

In this way, respondents described weighing the positive and negative sides of accepting an applicator job.

Some respondents saw the successful applicator as communicating as honestly as possible with his clients and the rest of the public. One university health and safety educator further characterized this "honest" communication as an ability to speak "in a way that's [neither] confrontational" nor persuasive. In the same vein, applicators who were "level-headed" or "laid back" in demeanor were also viewed as most successful, in that they were better equipped to handle potential run-ins with antagonistic members of the public. Describing the process of hiring employees, one manager of a regional lawn care company spoke of avoiding "somebody that's a hothead," because, given the wrong turn of events, "you've got a lawsuit on your hands." He explained:

I try to look for people that...appear to me to be very stable and if somebody...starts squawking at them they're gonna let it kind of roll off their back like water.

The need to be "patient," "positive," "sincere," and "polite" also seemed related to this idea of "honest" communication. Moreover, being "flexible"—that is, able to adapt to changing job conditions (including continually-updated state and federal pesticide regulations) was also seen as helping employees find success in what one landscaper/questionnaire respondent referred to as "always changing field."

An employee who is able to "manage" or "control" his emotions (Hochschild, 1983; Rafaeli & Sutton, 1987), such as anger or frustration at a customer or member of the public, might also be more likely to have what respondents seemed to refer to vaguely as "common sense." This concept appeared to include courteousness and concern for others' property. One manager of a regional lawn care firm described the simple act of closing the gate when leaving someone's backyard as commonsensical,

yet imperative to the job. He explained, “I’ve had instances where people had pets and they let the pets out and the door’s open and then we get a call, their pet’s gone,” thus implicating the firm. Likewise, a manager from a regional indoor pest control firm emphasized that applicators should know better than to “fill up a spray tank from a customer’s water supply [or] put a sprayer down on their carpet or on their kitchen table, or on their kitchen counter,” again suggesting that applicators could run into legal trouble, should any problems transpire.

Other traits linked to being a successful applicator seemed to center around one’s work ethic and commitment to the task at hand. Some characterizations included: “hardworking,” “energetic,” “[having] pride in job” and, “[in] good physical shape.” Several respondents also named “attention to detail” as imperative, as an applicator must constantly attend to precise mixing ratios, specific safety precautions, as well as one’s surroundings. Others noted that applicators must be self-motivated (i.e., not needing outside supervision), and able to see a job through to its completion. Interestingly, despite the “rote” connotation that may be ascribed to a 9 to 5 job, one manager of a regional indoor pest control firm noted that successful employees are “self starters” who can handle themselves. He added:

[They] don’t need someone to tell them what time to get up in the morning.
They don’t need someone to tell them what time it’s ok to go home at
night...they don’t feel comfortable punching the clock.

A handful of others thought that successful applicators were hoping to use their current position as a springboard for future, related work. Being (as respondents described) “outgoing,” “confident,” “intelligent,” and “career-motivated” would seem to relate to this idea.

Applicator skills

Some respondents felt that successful applicators need to have “substantive information”—what they saw as encompassing scientific information on pest control,

safety awareness, product and product use information, as well as knowledge of regulations and laws related to pesticides. One applicator on university natural lands described how her college background in biology and ecology was instrumental in performing her job. She explained:

If you...are spraying particular plants, you need to know exactly what it looks like, you need to know its life history and when's the right time to go at it, what's around it, and how to avoid what's around it to protect it.

In addition to possessing knowledge about the plants they treat, successful applicators are also seen as needing substantial knowledge about dealing with the *people* they encounter. Several respondents referred to “people skills” as involving getting along with a variety of personalities, both among their co-workers, and in the clients or other members of the public they might encounter on the job. One manager of a regional indoor pest control firm stated that some employees are unsuccessful “primarily because they can’t get along with people.” He pointed to these “people skills” as particularly important because, in his opinion, “We can teach somebody the technical part of our job...but what we *can’t* teach is somebody’s attitude to talk to the public, or get along with people.” Beyond just getting along with others, successful applicators were also seen as comfortable leaning on others as resources and information sources.

Related to “people skills,” the ability to communicate with others, whether co-workers or clients, was mentioned by a large number of respondents. As previously mentioned, several respondents mentioned that the job might entail interacting with “difficult” personalities (such as an “irate” neighbor or passer-by), and applicators needed to develop the skills to navigate potentially uncomfortable situations. Moreover, “ability to communicate” was often linked to being able to explain job-related information to clients or the public.

Finally, some respondents saw applicators as requiring some mathematical

ability to perform everyday tasks, such as correctly mixing spray solutions. “Problem-solving” or “technical” ability were also mentioned, such as being able to troubleshoot broken equipment in the field. Interestingly, a handful of respondents noted that, in order to become an applicator in the first place, one must be skilled at test-taking (i.e., to pass the licensing exam overseen by the state). One head grounds person in a school district pointed out that an individual qualified to become an applicator would need:

... An ability to memorize stuff because when it comes time to taking the exam, you have to know what you’re doing... They don’t set up the exams for just anybody to be able to take.

As implied by the range of skills and personal traits perceived as fundamental to succeeding at the job, the role of the applicator should not be dismissed as “easy,” “one dimensional,” or solely “physical labor.” In the following section, I approach the more central task of characterizing the applicator’s actual job itself.

Part 3: Job perceptions and the role of the applicator

“I think ultimately you need to educate people as to different...alternatives to just dumping tons and tons of chemicals on your yard.”

-Owner/applicator, local landscaping company

“But do we *want* to make [talking to clients about health information] a law? I don’t think we do...I’ve met some pretty simple folk that I wouldn’t want out there giving that information because next thing you know, they’re giving *wrong* information...”

-Pesticide state regulator

If, as described in the previous section, CPAs embody traits and develop skills that set them apart from mere physical laborers, how can we better describe the nature of their occupational “expertise”? What role or roles might be wrapped up in the general title of “landscaper,” “grounds person,” or “lawn service technician”? One pesticide safety educator, for example, described the applicator’s job as being “from the neck up and from the neck down.” In this respondent’s opinion, being a “successful” applicator requires both a “physical” (e.g., being “physically fit”) as well as an “intellectual” (e.g., ability to problem-solve, communicate with customers)

command of a multifaceted job. These comments serve as an introduction to the following section, which explores the ways in which respondents further unpacked the roles implicit in the job.

“Framing” the role of the applicator

Professional

A common theme repeated among the pesticide safety educators, as well as the managers and business owners, was the sense that applicators should strive towards “professionalism” in their job. Broadly-construed, this notion seemed to reject the aforementioned image of the applicator as temporary and easily-replaced; instead, these respondents hoped that, through proper training both in the classroom and in the field, as well as the adoption of a certain occupational and philosophical “ethic,” applicators could strive toward a “higher” standard of conduct. Some of the elements of “professionalism” respondents mentioned included:

- Going beyond the minimum requirements of the job (e.g., picking up a newspaper and hand-delivering it to a client).
- Addressing clients and the public with courtesy and respect
- Being invested in the job, wanting to learn more about the Green Industry, and taking pride in the profession.
- Attending to the personal care/grooming of self and equipment (e.g., having a clean vehicle and uniform).
- Understanding the underlying issues that inform decision-making in regard to pesticide use; conceptualizing, and being able to articulate, both the benefits and potential risks of pesticides.
- Recognizing the various responsibilities associated with the job, and actively trying to improve one’s ability to complete these tasks.

- Understanding the potential influence the applicator may have on customers and the general public.
- *For the pesticide safety educator:* Resisting “teaching to the test”; *for the applicator:* moving beyond just wanting to “pass the test.”
- *For the employer:* Allowing applicators to engage in professional development, e.g., conferences or outside workshops.

Speaking in regard to his experiences training men and women in the turf and lawn care industries, one pesticide safety educator advocated for the adoption of

“professionalism” within the Green Industry quite passionately. He noted:

...[The Green Industry hasn't] risen to the level where men and women think very much of themselves...When you ask them [“what do you do for a living?”], it's: ‘I kill weeds. I mow grass.’ It's the physical things ...Well, that *is* true, but they don't appreciate all the things that that does for people.

As this respondent further explained, a “professional” comes to a richer understanding of his role as an applicator: not just a weed killer, but rather one who produces aesthetically-pleasing landscapes. By understanding these potential *positive* contributions, he noted that applicators are better equipped to “understand the risks that they're also maybe producing...to understand how that fits into what they do.” This idea was expressed by small number of respondents, who noted that there are risks to *not* using pesticides (e.g., not maintaining a viable food supply, risking human/animal disease and infection, etc.); in other words, there are formidable risks posed by *pests*. One pesticide safety educator described the necessity for pesticides like so:

...If you have a yellowjacket nest in a playground, you have ten kids in that school that could go into anaphylactic shock if they get stung...Cockroaches are the number one cause of asthma in inner cities... [and] You can't have cluster flies falling into patients in an operating room.

Likewise, the head grounds person for a public school district agreed that, “there’s a place and a time for spraying.” Responsible for creating a safe physical space for hundreds of children and adults, he explained that

... When you come across poison ivy patches, you have to do something. You can’t...wade in with your hands and pull it out ‘cause you’re going to pay dearly!

Besides “paying” with his own case of poison ivy, this individual also insinuated that a decision *not* to apply an herbicide would jeopardize the health and safety of the community.

Interestingly, in this vein, several respondents pointed to the indoor pest control industry as taking deliberate steps to portray their workers as not just bug exterminators, but rather professionals trained to safeguard public health. Again, returning to the idea the *benefits* of a line of work, a pesticide safety educator suggested that indoor applicators have an easier task understanding, and thus articulating, the contributions of their services:

...They understand what a yellowjacket does and how it kills people. They understand what happens when a person gets bit [sic] by a brown recluse spider. Almost all of them... understand that cockroaches cause us allergy...[to] miss school...miss work, and lose money...They have something that they can sort of hang their hat on.

The ability to recognize and appreciate the benefits *and* risks accompanying any job is thus central to the concept of “professionalism.” This idea, echoed by several of this individual’s colleagues, further implied that teaching “professionalism” can both encourage applicators to strive toward a higher work ethic, as well as provide ammunition against anti-pesticide activists and naysayers. (Further discussion on the idea of a public “with an agenda,” such as the anti-pesticide lobby, will be addressed in the final part of this chapter.)

In addition to having a more nuanced understanding of the worth and impact of the job, being a “professional” was also seen as imparting *agency* as well as

responsibility to the applicator. One pesticide regulator saw a pesticide applicator license as essentially the same as any other credential, except that:

...We [applicators] have direct effect on the environment, and ourself [sic], and the community. *Immediate results*...It's not like a civil engineer where...you're gonna build something down the road...this is happening now.

This ability to directly impact environmental, as well as human health, would seem to clearly illustrate the role of an ARC; though perhaps unrecognized as such, applicators hold considerable power to shape both attitudes and ecosystems in an immediate sense, and in the people and places closest to them.

Educator

Respondents across several categories expressed the idea that applicators could (or should) be educators; however, perhaps unsurprisingly, the sentiment was particularly prevalent among applicators employed by universities. Among the interviewees, several applicators working on university campuses described their job as involving a deliberate teaching component. Interestingly, these respondents spoke of educating both colleagues and superiors in the workplace, as well as clients and passers-by. One head of a university grounds department described convincing a dean to decrease pesticide use and adopt more IPM practices as a “balance” of meeting the university’s needs—manicured, weed-free, green spaces—while employing (in his words) “environmentally-responsible” practices. He remarked:

That's where education comes in. I go to [the dean] and say, ‘...A couple weeds are ok, you know? We'll do a broad spray once every three years and I'll do selected control in between. And if it gets to be a problem, we'll just schedule another spray...’

In this sense, “educating” the dean that alternative techniques could be employed in place of rote spraying appears to take on a distinctly persuasive quality. Likewise, a groundsperson at a different university spoke of education as a “mission” in his department, and saw his daily interactions with people on campus as a series of opportunities to engage in discussion as well as to (in his words) “influence people.”

He stated:

[The public] might see that information on the sign and still not be satisfied, but at least if they engage you rationally, that's an opportunity to disseminate the correct information and actually go a little more in depth than what they would see on a little pesticide sign.

In this sense, he also saw these interactions as performing the “public relations” element of his job, noting, “... It's a good way for us to turn what could be a potential negative—people thinking negative about the department or the university—into a good experience.” Following in this vein, a manager of a university orchard saw himself (and his employees) as able to influence the attitudes of their clientele towards pesticides. He commented:

...Hopefully we're teaching the *public* that pesticides are so far necessary...What we try to do here is to say... 'Every apple does not have to be red, and this shape, and perfect'... And I think we have trained our customers to say, '...They don't taste any different. There's nothing really wrong with that.'

Through both direct conversations with the customers, as well as the marketing and sales in the store, this respondent saw his employees as able to challenge the norm of blemish-free fruit.

Education was also understood as the ability to lead clients and the public to change behaviors. For example, a manager of a regional indoor pest control firm saw his job as providing the space to educate about practical ways to “reduce pests becoming a problem for them,” in this way encouraging modest behavior changes, such as how to properly store food in the kitchen.

Public relations and service

A large number of respondents described the role of the applicator as representing a business or institution, as well as the larger Green Industry. In the process, these individuals served as “liaisons” or “ambassadors” for these groups. As one respondent, a university groundsperson, noted, an ideal employee in his job “can represent the department and the university in a positive light and answer any

questions...in that manner.”

As employees of a service industry, applicators were also seen as needing to fulfill the tenets of customer service. Clearly, “customer service” can connote different tasks in diverse settings, from food service to retail, depending on the spoken and unspoken institutional culture (see Chapter Two). One respondent, a risk communication consultant for government agencies, defined “customer service” in the context of the Green Industry as “how [applicators] relate to people.” (Further discussion on the conflation of “public relations,” “service,” and “risk communication” is provided below.) More often, respondents framed “customer service in terms of selling—whether services, products, or opinions on pesticides; as a pesticide safety educator noted, “...Every single technician has the potential, ‘cause it’s not that hard, to be your best salesperson for the company.” Another respondent, a former insurance salesman turned landscaper, used the language of “selling” to compare his current line of work to his former:

It was a whole lot more fun selling someone the idea of...putting shrubs in than buying a life insurance policy...You can show your landscaping off to your neighbors, your friends, your relatives, your guests. You don’t want to drag out your life insurance policy, so it was a much easier sale.

In a few cases, especially among the respondents in the indoor pest control industry, “customer service” was understood as having a clear rhetorical element. Adopting certain language and conversational techniques could persuade customers to have a particular opinion of the applicator, the institution, and the industry; as previously discussed, avoiding saying “flat no’s” to customers, was seen as imperative to securing business.

Finally, in several cases, respondents equated “customer service” or “PR” with “professionalism,” a concept previously discussed in this section. Adapting the language of “professionalism” and the “bottom line,” one pesticide safety educator noted that:

...It's important for [bosses or managers] to make sure that the applicators are applying these pesticides as professionally as they can because it reflects on their profession and, more important, on their business... If you get a lousy applicator, the chances of you calling back that business are not very good.

Consultant

A handful of respondents noted that applicators can act as “consultants” to clients; however, this role seemed to be reserved to those working for more “higher end” firms, where clients expected a certain degree of service in exchange for the elevated prices paid. One respondent, an owner of a local landscaping firm, described the process of consulting with a new client about whether to apply pesticides to a home lawn, as “...like anything in life—figure out what you’re trying to achieve...Do you want this golf course type lawn? What does it take to get that?” Depending on the client’s answer, the respondent then analyzed the surrounding landscape, factoring in things like amount of sunlight and types of tree cover, to further determine alternative, non-chemical options. He concluded:

... Before you can...throw all those chemicals on, you have to figure out what they want to do and...then you can give them some alternatives...like aerating, and de-thatching, and... cutting down trees.

In this sense, the applicator is not only an informed advisor, but also a partner who both initiates and engages in directed dialogue with clients. Moreover, depending on the client, or the circumstances, the applicator must adapt the “expertise” he or she shares, making his or her communicative role all the more nuanced and complex.

Risk communicator

Respondents seemed to attach a number of different meanings to the term “risk communicator.” In general, those who commented specifically on applicators as risk communicators were pesticide safety educators, consultants, or public health/safety officials—namely, those with some degree of distance from the day-to-day occupation, but who think about occupational risk as part of their job. (Applicators themselves were less likely to introduce the term themselves, without prompting from

the interviewer; this is hardly surprising, given that “risk communicator” is likely outside of common vernacular.) Among these respondents, two broad themes emerged from the discussion of what a “risk communicator” is and what this individual should do: (1) perform public relations or “customer service” work and (2) exercise empathy. Once again, as will be shown in the following quotations, it is interesting to note that the concept of professionalism (previously discussed in this section) seems to emerge as part of each theme.

Public relations or “customer service” work

In this case, respondents saw the job of risk communication as embodying the role just discussed. As one pesticide safety educator summed up, “A risk communicator is really a fancy word for customer service...they’re all wrapped up.” Applicators were seen as needing to understand the workings of the pesticide in order to explain both its benefits and possible risks to clients and the public; all the while, they represented the face of the business and the industry through *actions*, *appearance*, and *words*. As described by another pesticide safety educator:

If a guy who’s a professional shows up and starts spraying a lawn in shorts and sandals and no gloves, he’s communicating what he sees as the level of risk to people...Now, on the other hand...if you have a guy out there spraying a lawn and he’s wearing a *moon suit* that sends out some flags in the neighborhood.

Exercising “empathy”

Several respondents referred to “getting in step with people’s concerns” as being an integral part of the applicator’s job, a role I define broadly as “exercising empathy.” Acknowledging fears and concerns, no matter how trivial or “irrational,” was seen as central to this process, as was being an attuned listener. According to one respondent, an owner of a local lawn care company:

We try to understand [the customer’s] situation, as trivial as it seems to us sometimes... You get a call... they’re seeing ants and they want you there right away. Sometimes you think, ‘Well it’s an *ant*.’ But you have to really put yourself in their position and realize that they don’t want the ants there.

By responding promptly to the customer's "trivial" concern, this respondent seems to experience "emotional dissonance" in the sense that Hochschild (1983) means: "when expressed emotions satisfy feeling rules, but clash with inner feelings" (Rafaeli & Sutton, 1987, p. 32). In other words, there is a mismatch between what the respondent may feel (annoyance, mild anger) and the feelings he must express, per job demands (concern, seriousness, empathy). Similarly, one former trainer in the indoor pest control industry mentioned that applicators should express care and concern, acting as the "first" listener (rather than speaker), and trying to tune into words a concerned client might be emphasizing. As she put it, "God gave you two ears and one mouth and you should use them in that ratio!" In both these instances, applicators are tasked with "emotional labor" (Hochschild, 1983): the need to suppress "true feelings" in order to sustain certain (expected) outward emotions or reactions.

Part of the project of "emotional labor" for many applicators also seemed to be "personalizing the risk"—that is, making risk more relative to the individual (e.g., customer) rather than abstract, or in "textbook" form. In some cases, "personalizing the risk" appeared in the form of comparing oneself to the client or member of the public; for example, a lawn care applicator might admit that he, too, fears some of the risks of pesticides, or an indoor applicator might admit that he, too, has struggled with insect problems in his own kitchen. One pesticide safety educator explained the type of language an indoor pest control technician might employ in order to reassure a client with a cockroach problem: "... Look at your kitchen, *it looks like mine...*but...when was the last time you pulled the fridge out?... What kind of old crackers do you have in the back?" Comparing one's own situation to that of the client, while asking familiar, non-threatening questions can thus placate an anxious client and avoid the act of blaming; such a technique is another example of "emotional

labor.” Posing another example of encountering lice in a house, the same respondent suggested that *reassuring* clients (“It’s not your fault you have head lice...It happens to everybody”) could be just as necessary as treating the house with chemicals or its inhabitants with medicine.

In general, according to the respondents, by being honest and sincere (see previous discussion on the traits of the applicator in part two of this chapter), applicators are more likely to be trusted by clients and the public than a government official or other outside “expert.” Summing up this sentiment, one applicator at a local lawn care company explained his interaction with the public as such:

It all starts with care. And sensitivity... I don’t preach what I’ve read in the books because I don’t remember what I read in the books. Just experiences...that [my father-in-law or brother-in-law have] had... I always...use that as a tool to assure people that it’s not that bad.

Just as Rafaeli & Sutton (1987, p. 23) note that “friendliness and good cheer” are (somewhat) tacitly expected of flight attendants and sales clerks, while bill collectors and bouncers “are paid to convey hostility,” perhaps pesticide applicators, too, earn part of their living by projecting concern and care. (This idea will be explored further in Chapter 5: Conclusion).

“Don’t try to make the applicator more than they are”

To a handful of respondents, the expectations of a pesticide applicator should be reigned in, and applicators should not be required to do (or held responsible for) certain tasks, possibly some of those stated in the previous sections. One respondent, a pesticide regulator, noted that the applicator should *not*:

...Be a scientist, if they’re not...Be a doctor if they’re not...I think that [the applicator] needs to have the ability to communicate as simply as possible without going beyond their abilities.

Likewise, stressing that the credentials of an applicator only allow him so much expertise, a pesticide safety educator argued:

...We’re not training pesticide applicators to be toxicologists. So I think they’re gonna learn what they need to learn...to apply that pesticide, to follow

the label and do the best they can.

While these respondents' statements imply a clear limit to the role of the applicator, the line between what is "expected" versus "beyond their abilities" is quite vague. In sum, a clear tension emerges between recognizing the multifarious and complex roles played by applicators and recognizing some indistinct, not clearly codified, *limit* to their work. To further clarify the muddiness of "job roles and expectations," the following section unpacks communication with clients and the public. In this sense, I follow the example of Star & Strauss (1999) and Bowker, Star, & Spasser (2001) in an attempt to draw out critical tasks usually "embedded" into "work that is legitimate, individuated and traceable across settings" (Star & Strauss, 1999, p. 15).

Part 4: Communication with clients and the public

"I think if pesticides were only applied by professional, properly trained individuals and not by 'Joe Homeowner,' we would not have to discuss this topic."

-Manager, local lawn care company¹² on the possible link between pesticide and illness

A fuller understanding of applicators' communication with the public requires considering their perception of the people with whom they interact. In the context of a variety of subjects, ranging from pesticide legislation, to their own application practices, to the communities in which they live and work, respondents often brought up less-than-positive perceptions of "the public." Whether seen as lacking credentials or married to a cause, members of the public were often described unflatteringly and in sweeping terms. The following section first explores perceptions of the public, followed by common questions received by the applicator, and finally, how these questions are typically addressed.

Perceptions of the public

"Joe Homeowner"

Many respondents referred to a stereotypical member of the public, an individual I will call "Joe Homeowner." Generally speaking, this figure was seen as an

¹² Questionnaire respondent

ill-informed consumer, equipped with purchasing power but not substantive information about pesticide products and use. The allusions received through interviews and in several of the questionnaires led to the following composite illustration of “Joe Homeowner”:

- He can purchase pesticide products with abandon at the neighborhood “big box” store.
- He tends to adopt a “more is better” philosophy: more weed killer is better than a little weed killer, even if the label says otherwise.
- He can be ignorant of the additive ingredients of common pesticide formulations.
- State law technically covers his adherence to proper pesticide use, safety precautions, and disposal; in reality, his behavior is suspicious, and nearly impossible to track and/or monitor.
- He sometimes ignores signage and other written warnings from commercial certified applicators.
- He has a responsibility to be informed about the pesticides he uses, but may choose not to be.

A university natural lands applicator sums up several of these traits quite representatively by stating, “...People are sloppier...A lot of people use protective gear at work because they’re required to by their boss, but then at home they might not.” While these choices may appear to be purely self-interested, this respondent points out that Joe Homeowner’s behavior, by its nature, often cannot be confined to his own backyard. She notes, “...[If] your neighbor’s using something and...they’re not being safe about it, then that could really affect other people.” (See Appendix G for a list of representative quotations related to the “Joe Homeowner” theme.)

Why might applicators emphasize the *negative* attributes of the public, many of whom pay their salaries? Why would the concept of “Joe Homeowner” act as such

a salient discussion point with a variety of respondents—from educators, to landscapers, to commercial pesticide applicators? There are at least two potential answers to this question that I will explore.

First, while respondents may, in fact, care deeply about the health and welfare of certain “uninformed” members of the public, they may also care about retaining their own authority, credibility, and status. That homeowners can purchase and apply the very same materials that applicators need a license to touch may threaten, and even de-legitimize the role of the applicator. If any old “Joe” can apply Roundup® with no clear problems ensuing, what use is an applicator, license or not? When trained applicators and untrained citizens have access to (many of the) same products, and citizens choose to use these products themselves, the aforementioned multiple roles played by the applicator (e.g., educator, consultant, risk communicator) become null and void.

Second, the constant “Joe Homeowner” allusions may filter down from either pesticide safety educators and/or Green Industry representatives—in either case, garnering support for the group’s interpretation of the role of the applicator. When asked to speak more about why he felt that the “problem” with pesticides stemmed more from misuse by consumers rather than with commercial applicators, one head grounds person in a public school district replied, “It’s our teachers. They’re always saying: *‘It’s those people who go down to Agway and buy that stuff and just throw it out there on the lawn.’*” Based on the degree to which these “teachers” (i.e., university pesticide educators) stressed the idea of professionalism in our conversations (see previous discussion in part three of this chapter), it is hardly surprising that this rhetoric might transfer to the training sessions and workshops they administer with applicators. (Similarly, another respondent highlighted attitudes towards environmental issues as another source of information potentially “passed down” from

educators to applicators. This individual, a pesticide safety educator and trainer himself, observed pesticide certification trainers who treated the subject mockingly, apparently without the proper depth or seriousness rightly due.)

Yet, not just educators are utilizing this vocabulary to their own ends; according to a toxicologist with significant experience in the Green Industry, managers and other industry professionals also “blame the homeowner” to “deflect that there is a risk” of pesticides. She stated:

[Managers say], ‘The problem lies with the consumer because they don’t...understand the risks, and they apply badly and don’t read the label.’...So the problem is a *consumer* problem, not an applicator problem because [applicators] read the labels and [are] careful and...know what [they’re] doing.

In sum, it is possible that the reference to “Joe Homeowner” may be traced to multiple interest groups, each implicating the homeowner as a way to win status and positive recognition for its own side. As has been shown, this term seems to function as a frequently referenced “black box” in the Green Industry vernacular, representing several (as of yet) undifferentiated notions of the power and expertise allotted to the applicator. (More discussion on expertise will be provided in Chapter Five: Conclusion).

Public with an “agenda”

Besides dealing with Joe Homeowner, a number of respondents also spoke of confrontations with citizens holding what they saw as “extremist” viewpoints in relation to their line of work. While some respondents referred to “advocates” (e.g., “environmental advocates”) in the abstract sense, others focused on a particular class of a member of the public they might encounter in their daily work. In both cases, respondents described individuals with an “agenda” related to health or environmental advocacy and often gaining what the respondents saw as undeserved public and/or media attention. According to respondents, while these individuals often lacked

credentials or qualifications to comment on the health or environmental impacts of pesticides, they nonetheless made their polarized opinions known through various communication outlets, whether the local news or face-to-face communication with applicators. Referring to the local government in his area, a medium-sized metropolitan area in New York, one regional lawn care service manager/applicator noted:

...The city fathers have decided to listen to a...very small group of individuals that bill themselves as experts and they get everybody riled up about all of these pesticides being...poisonous and killing our kids and our dogs.

By persisting in the media spotlight as self-proclaimed “experts,” these individuals thus secured enough attention and credibility to override this applicator’s authority. In regard to he and his colleagues’ campaign to make the “Neighbor Notification Act”

(see Chapter One) void in his county, he spoke with noticeable frustration:

...Even though we’ve gone to the legislators and given ‘em signed statements from our clients that they don’t believe any of this, and the fact is there’s no toxicology reports anywhere of this stuff, the city fathers seem to go along with this little group of people.

Other respondents suggested that other members of the public ask questions to “test” the applicator’s expertise, perhaps feeling superior to the applicator because of personal knowledge or experience. As one respondent, an applicator at a university natural lands area, described:

I’ve run into people who...have that little grain of knowledge that’s more dangerous than useful and...they come right up on the attack, immediately... like they have all the answers.

Noting that she, a licensed applicator, didn’t “have all the answers herself,” this respondent characterized these confrontations as uncomfortable. Similarly, a

university groundsperson described encountering “people with an agenda” like so:

... If they don’t like the answers you give them...they just...try to get you to change your answer or...they have an answer they want to hear and anything that’s not that is unacceptable. Those people, there’s not much you can do. All you can do is give them the facts.

In response to the manipulative tactics of these individuals, this applicator seemed to have his hands tied; while he suggested that distributing “the facts” might be a defensive tactic, he also implied, somewhat fatalistically, that “these people” always win.

Finally, several respondents referred to a class of “irate” members of the public who were difficult, if not impossible, to reassure through common methods like face-to-face discussion or by sharing written risk information such as labels or MSDSs. As previously mentioned, the ability to remain cool and composed throughout interactions with these individuals is seen as a highly prized trait.

While the previous discussion has centered on individuals *outside* of the Green Industry, it should also be noted that the Industry, itself, forwards a partisan argument on the “safety” of pesticides. One respondent, a university turf researcher, suggested that, while the Green Industry might attract negative attention from certain advocacy groups, the industry’s own position is far from neutral. He said:

I think that our industry gets confronted a lot and gets itself into an adversarial situation with environmental advocates...Their position is, ‘pesticides are killing you.’ And industry’s perspective is, ‘every pesticide is ok.’ ...There has to be [a balance].

Can applicators provide the “balance” to which this respondent refers: between the anti-pesticide “environmental advocates” on the one hand, and the pro-pesticide Green Industry, on the other? Does distributing “facts,” whether in written or oral form, mollify the “public with an agenda,” or will the group gain visibility and credibility nonetheless? Whatever the ultimate result of their interaction with this motivated public, applicators clearly *work* at balancing multiple interests. While this work may be both inconclusive and under-the-radar, it nonetheless constitutes a central task of the applicator: an *invisible* job responsibility—as well as source of frustration—for which little support seems to exist (Star & Strauss, 1999). (This idea will be explored in more depth in Chapter Five: Conclusion).

Receiving questions from the public

When applicators are directly addressed, what kinds of questions are being asked? Both interviewees and questionnaire respondents were asked to recount some of the most common questions received on the job—either from their personal experience (as applicators themselves), or indirectly (as pesticide educators, managers, university-affiliated researchers, etc. who interact with applicators on a frequent basis). The following four categories emerged as the “core” of the content areas in which most questions could be placed:

First, applicators described questions that fit the 5Ws: *who, what, where, when, why, (how)* designation. These questions centered on the reasoning for, as well as logistics of the application itself. Typical questions in this category would include:

- What are you applying? What does it do?
- How often do you need to apply?
- Why are you applying?

A second group of common questions could be group into *general safety and precautionary behavior*. Besides the quintessential “is it safe?” question, questions in this category also dealt with both the applicator and the public’s behavior around the application area. For example:

- How long should we stay off the treated area?
- Doesn’t that stuff bother you?
- Shouldn’t you wear a mask?

Third, applicators reported being asked questions related to *general health*. Respondents relayed that members of the public frequently ask questions surrounding their own (and families’) as well as the applicator’s health. They also question the effect of the pesticide on the environment. Typical questions would include:

- Is the chemical toxic—to me, to you, to the public in general, or to the environment?
- Are there any serious health risks?

Finally, many questions arise with respect to the health of their *pets and kids* in regard to the use of pesticides.. Most centrally:

- Will your product harm my dog, cat, child, etc.?

Addressing questions from the public

Temporal issues

Interestingly, a number of respondents, almost exclusively those working at universities or in school districts, noted that their pesticide application schedules often kept them from having any contact with the public whatsoever. Both certain times of the year and certain times of day are selected and often required, by mandate, to be the only occasions when pesticides are applied. According to the head grounds person of a town school district, “...The only time I spray’s in the summer... ‘cause if we have to notify all the concerned parents in the school, that’s just too much of a nightmare.”

Citing physical exposure as well as (psychological) concern as reasons, a university head grounds person explained:

We purposely [spray] at times when less people are around just for exposure, not so much to hide it, but more for...less potential concern for folks. But it’s not... anything that we’re really trying to hide.

Again, providing the reasoning as safety, as opposed to illicit activity, another university grounds person noted:

...We try to be as low-key as possible...For the most part, on campus we try to be done spraying before 8 o’clock [AM] so very few people see us to begin with. Because you really don’t want to create a lot of attention even though what we might be spraying would be completely safe.

Another university applicator explained having to work around other special considerations around the university’s family housing units:

...We’ll [apply around] 6-7 AM before the children or anybody’s out and about...[Parents] don’t want to walk around with their kids, and we wouldn’t

do it anyway...with little kids around because they're curious.

Similarly, at one university's orchards, per university mandate, workers must wait until after 5 PM to spray, under the logic that most classes have finished and workers have left campus; unfortunately for the workers, as a result, as one respondent pointed out, "...We also spray until one o'clock in the morning because of that."

As the previous quotations have suggested, institutional rules often dictate when and where the applicator can be present; as such, the possibility of engaging in face-to-face dialogue with the public can be severely restricted. While scheduled to reduce exposure and limit concern, these early morning applications, ironically, may come to be interpreted as "illegal," "unsafe," or "unsavory" behaviors. Instead of a human representative, the public is met with non-interactive "traces" of the process: signs imploring them to "keep off the grass." Though this research did not consider the public's perceptions of these written forms of risk communication, nor their appraisal of the applicator, it represents a rich area for further study.

Protocol for answering questions

When they *are* present to answer the public's questions, applicators often defer to certain pre-established practices in place that ensure reliable communication channels between the applicator and higher management and help to ferry questions to those with the "appropriate" expertise. While no manager or boss that I spoke with strictly forbid an employee from answering questions from the public on his own, they did encourage their staff to defer to the management, often for technical or health-related questions. As a manager of a regional indoor pest control firm described:

...There's a hierarchy that goes technician asks supervisor, supervisor moves it up to the operations manager, and ultimately it gets to me. When it comes to questions of health or toxicity, they usually call me directly.

Similarly, another former safety trainer in the indoor pest control industry described teaching a highly structured system called "the points of customer care," known more colloquially by the acronym "rap with the ref," in which applicators were taught to:

- Report in to the job site
- Address the person who is the main contact
- Perform the service after addressing any concerns
- Report back to a manager or boss
- Explain what you did (to a manager or boss)
- Follow up with the customer

In this sense, the responsibilities delegated to each party—applicator and manager—are clearly delineated prior to the job, most likely to streamline the system and ensure that client, applicator, and manager are all on the same page. Arguably, this type of communication schema might not vary considerably across a wide range of service industries, whether involving a risk-imbued service like applying pesticides, or a more “benign” service like delivering packages.

Depending on the type of questions received, a certain communication “pathway” may be utilized. A manager of a regional lawn care firm described his company’s protocol as such:

[For] the more technical stuff I just tell [the applicators] to have [the client] give me a call... Or they will come back and on their work order for the day leave me a note... ‘the lady asked about this or that’ and I will follow up and call and see what her question was.

To assist his employees in on-the-ground interactions with clients, an owner of a local lawn care gave each applicator a cell phone, justifying his decision as such:

...Sometimes [the applicators will] just get into a situation, and they may not quite be able to answer the question, but we’re pretty much tight communication... If they have a problem or a question, they can get a hold of me right away.

Clearly, in this case, as well as others described, the applicator is granted considerable agency in addressing the public’s questions; indeed, many managers interviewed seemed to prefer that the applicator answer the question “in the field” for the sake of time and efficiency; however, while the occasion for, and method used, to “defer to

the boss” varied among respondents, the underlying logic remained the same: there are certain subjects better left addressed by the management. In sum, respondents described systems in place that functioned in support of both the individual applicator and, more broadly, the image of the Green Industry.

Avoiding certain language

When applicators answer questions, there seems to be certain ways in which their bosses hoped they would respond. A group of respondents, mostly managers/bosses and pesticide safety educators, described the importance of both *listening* for certain words from clients or other members of the public as well as *avoiding* using certain words themselves. According to one former safety trainer in the indoor pest control industry, applicators in her firm were taught to listen for what she called “buzz words” when dealing with clients. If a customer used one of these words—to use her examples, “children, pets, pregnancies, health, or multiple-chemical sensitivity”—applicators were encouraged to follow up with additional questions, and to consider consulting with a supervisor. In following, the supervisor would then decide whether the situation posed a liability issue, and whether the company should, in fact, go through with the service.

A number of respondents discussed avoiding the term “safe” in conversation with clients and the larger public. According to one owner of a local lawn care firm:

...I stay away from that ‘safe’ word...I’m sure I’ve used it, but... I read a lot of articles...especially in advertising and they want you to stay away from using ‘safe’ because... technically I guess it isn’t really ‘safe.’

In general, respondents struggled with how to address one of the most commonly asked questions: “is it safe?” One manager of an indoor pest control firm described the question as “loaded,” and explained:

...I don’t answer yes or no, I’ll answer: ‘If I use [the pesticide] in the way it’s intended to be used and I use the training and education that I have... there won’t be any problem, we’re not going to contaminate anything, and we’re not going to injure you or anybody in your house.’

In this same vein, another respondent, a manager of a regional lawn care service, relayed his frustration with translating university research to on-the-ground discussions with clients. Describing his and his colleagues' interactions with university pesticide safety educators, he noted:

...We get into these discussions about pesticides and whether they're dangerous or not and [the educators] seem to clam up. Yet they'll have these meetings and tell us about all this research showing us that nothing's happening and then they say, 'Well, we really can't...say that because we're some...state school...we have to be very careful.'

Left to make sense of the seemingly contradictory messages of the university educators about pesticides—on the one hand, suggesting “safety,” and on the other, suggesting uncertainty—the respondent was unsurprisingly exasperated. Insinuating how the educators' mixed messages may affect his credibility with the public, the respondent continued:

...If [the educators] tell us one thing, why can't [they] tell the public? Because now we're kind of caught because...[the public is] hearing something totally different and [the university's] research is showing that no, that's not right.

Left to balance these multiple ideas of “safety” while navigating (largely unspoken) institutional norms, the applicator is justly perturbed; all of a sudden, a “simple” question from the public becomes a perplexing “boundary object”—an intangible idea that can straddle a line of divergent interpretation between different social groups or constituents (Star & Griesemer, 1989). As such, the question itself becomes embedded with manifold political, social, and scientific meanings.

In answer to this situation, one pesticide safety educator explained why university representatives might waver, hesitating in making definitive safety judgments for the public. For example, he described the considerations that went into creating a multiple university-sponsored Internet database to share pesticide toxicity information with the public:

...The people out [at another university]...were much...bolder than we were in trying to...tell people 'it's safe if you were exposed at this level but it wasn't

safe if you were exposed at this level.’ It doesn’t work that way... We didn’t want to be a final clearinghouse.

The previous discussion suggests at least two challenges that applicators, and, by extension, ARCs in general, must face in addressing questions from the public. First, as suggested by the importance of listening for particular words, applicators must function as “active” listeners. Instead of passively “receiving” what the public says, they must be primed to respond to words that may serve as representative clues to larger, underlying issues and concerns. When the values, perspectives, and/or risk perceptions of the applicator and the public diverge, however—as they often do—the work of listening seems to transform into what Walter Parker (2003) calls “listening across difference.” Applying this concept, which Parker refers to in respect to teaching democratic citizenship in the classroom, would mean an obligation on the part of the applicator to listen, regardless of the “cultural and intellectual ‘home base’ from which he or she thinks and feels and observes the problem at hand” (Parker, 2003, p. 94). (Recall one respondent’s training mantra to “be the first listener” regardless of how outrageous, ill-informed, or even offensive the comment. Such advice is also in line with the concept of “emotional labor.”)

Second, the need to address the ubiquitous “is it safe?” question puts applicators in the unenviable position of communicating uncertain science. As evidenced by the above story of the pesticide information database, universities often shy away from communicating a definitive “yes or no” answer in regard to the safety of pesticides; however, when face-to-face with a concerned client or neighbor, the applicator may find it far more difficult to waver. Within the risk communication literature, much research has focused on the role of the media—most principally, newspaper journalists—in conveying complex, uncertain science (e.g., Friedman, Dunwoody, & Rogers, 1999). While scholars have documented the role of interpersonal communication in conveying risk and uncertainty, such as in the doctor-

patient literature (e.g., Ong, de Haes, Hoos, & Lammes, 1995), less work as examined instances of *informal* communication of this nature.

Underlying the ways in which applicators respond to questions, of course, is their own estimation of the risk, as well as the science that determines this risk. The next section of this chapter focuses on applicators' perceptions of risk and "Western" science as central determinants in the nature of their communication with the public.

Part 5: Perceptions of risk and "Western" science

"Too much of a good thing is still *too much*. Toothpaste is very toxic if you swallow too much of it."

-Trainer/developer, local lawn care company¹³

The following part of this chapter is divided into five main sections, each with additional sub-sections. The first section begins with an overriding theme that emerged throughout respondents' discussion about occupational risk: the idea of "self" vs. "others." From there, the next section explores general risk perceptions of pesticides, including ways in which respondents used contemporary environmental, social, and regulatory conditions to "frame" their understanding of the risks posed by their job. The third section deals with the role of self-efficacy, or perceived control over the risk, in determining respondents' risk perceptions. Perceived risk to human health is next covered in the fourth section, centered on the role of salience and availability. Finally, the last section integrates the concepts of trust and credibility into the discussion of respondents' perceptions of "Western" science.

Self vs. others

A large number of respondents distinguished themselves and their personal practices, or the business/institution they worked for and its practices, from a generalized idea of "the other guys" or "the competition." In all the cases, the

¹³ Questionnaire respondent

respondents saw their practices as superior to their competition (e.g., more environmentally-friendly or more responsive to the customer). Several respondents even expressed disgust at what they saw as irresponsible practices performed routinely by “others”; they saw these actions as following directly from this “flawed” philosophy of doing business, including:

- Ignoring current advances in turf science regarding product selection, application techniques, and number of necessary applications
- Perceiving a turf/lawn business as a purely profit-seeking venture
- Ignoring recommended health and safety precautions
- Not caring about the individual customer and his or her unique needs

Based on the in-depth interviews, this separation of self from others seemed to span all sectors; university employees, to national chain managers, to private business owners all sought to distinguish their work ethic as superior—either environmentally, philosophically, or often both. Explaining how his approach to doing business differs from that of the national chain competitors, a local landscaper noted, “...The reason I got into this was to kind of try a different approach than most owners...a lot of people just kind of look at this more as a business to make money, and I try to treat my customers like an individual [sic].” On the other hand, a manager/owner of a regional branch of a regional lawn care service chain distinguished himself from what he saw as the *even bigger*, less “customer-aware” operations by commenting, “...*a lot of* ...what makes me a little bit different...from some of my competitors, is I’m not looking at this business as a *cash cow*.” He likened his method of doing business to being a “real doctor” who informs a patient that he needs certain operations:

A real doctor isn’t gonna tell you [to have an operation] unless you need the operation; he isn’t gonna be upselling you: ‘Now you should have this or have that.’ That’s a lot of what these companies do.

Several respondents reaffirmed their commitment to safety by implicating their

competition. Although one local landscaping company owner suggested that he avoids “stereotyping” any one “type” of applicator working for a particular company, he nonetheless remarked:

I do see [employees of a national company] out sometimes when it’s windy, and...the stuff is blowing, probably, everywhere, or that they’re inhaling it, or they’re not wearing rubber gloves and their hands are wet with the product.

In comparing their jobs to those of their compatriots in the Green Industry, respondents also acknowledged the relative benefits their positions provided, and some of the struggles others might face. A university turf researcher, who had prior experience working as a commercial pesticide applicator, spoke of the “luxury” of having the time to engage with the public in her current job, yet also acknowledged being able to avoid constant interaction due to the nature of her work. In regard to the thought of working for a commercial lawn care firm once more, she noted that it, “...would be *really* hard and I would *hate doing it...I don’t want to deal with the public!* The homeowners griping... It’s like being in retail.”

Why might respondents claim that their practices are more responsible, their jobs more flexible, or their treatment of the customer better than their colleagues? Might something more than “friendly competition” in the marketplace be operating here? By positioning themselves as superior to those who would appear to be “less well off” in an occupational sense, respondents appeared to be enacting a form of “downward comparison” (Wills, 1981). In its basic “strong” form, downward comparison theory holds that “persons can increase their subjective well-being through comparison with a less fortunate other” (Wills, 1981, p. 245). Within the social psychology literature, this theory has addressed “situations in which frustration or misfortune has occurred that is difficult to remedy through instrumental action” (Wills, 1981, p. 245) and has been validated experimentally. Would a climate in which applicators may be competing for the same clients supply the necessary “frustration”

to motivate respondents to engage in “downward comparison” with their colleagues? As evidenced by the above quotations, what results is likely *not* a targeted, malicious attack; instead, “downward comparison” appears to occur *passively*, and emerge only as attached to general narratives of their work. As Wills (1981, p. 246) notes in regard to a corollary to the theory, “Downward comparison can occur on a passive basis in which persons take advantage of available opportunities for comparison with a less fortunate other.”

It should be noted, however, that not all respondents in this study were, in fact, “competing” for clients; indeed, university researchers and grounds employees did not “compete” *at all* for the recipients of their services (i.e., students, faculty). In this case, does the general stigma surrounding pesticide application, as well as the negative reputation attached to certain firms motivate respondents to “justify” their occupation via downward comparison? Would the same effect be expected within other ARC populations—such as commercial painters, tattoo artists, or construction workers—who might *not* deal with the same degree of occupational stigma? While these questions cannot be answered with the data collected in this study, clearly additional research—both field study and experiment—is needed to explore this issue further. (More discussion on future research directions will be provided in the Conclusion.)

Environmental views

Often brought up in regard to their “competition” or “others” in the business, environmental issues related to pesticide use were a central concern for a large number of respondents. Several respondents, both applicators and educators, mentioned the need to limit the amount of chemicals used (especially the most toxic) as well as the number of applications made. As one turf researcher summed up, “...If we don’t need to use [pesticides], let’s not use them!” In the same vein, both applicators and educators brought up the need for integrated pest management, both in the abstract,

and more specifically, in the lawns and natural areas they managed. One local landscaper talked about IPM methods he employed on his clients' properties, and remarked, "I'm not a huge advocate of just dumping tons and tons of chemicals on."

In addition to supporting IPM, a small number of respondents also described their views as contrary to accepted societal norms, such as the green lawn. One former lawn care applicator and current school groundsperson stated, "I [don't] believe in the perfect lawn... I can tolerate [weeds] versus the use of chemicals." Finally, a handful of respondents showcased their understanding of biological systems by acknowledging the possible environmental impacts of pesticides. One university applicator working in a natural lands area stated:

... The reason why we're getting at a species is 'cause we're really trying to protect the native plants species, so [we] have to be really careful in our application...to protect the resources.

Given the small number of women represented in this study (n=3 interviews; n=1 questionnaire), one cannot make significant claims as to differences in environmental views between male and female respondents yet, it *is* worth recognizing the qualitatively high degree of informedness about environmental risks (e.g., awareness of invasive species), and positive attitudes about environmental conservation (e.g., support of IPM methods) shown by the respondents overall. Instead of focusing on the gender of respondents, however, perhaps greater attention is due to the culture surrounding their work. To review, Bord & O'Connor (1997) concluded that "gender gaps" in environmentally-related issues (as measured by surveys) "are primarily a function of differences in perceived vulnerability to risks" (Bord & O'Connor, 1997, p. 839). These differences in perceived vulnerability, in turn, may stem from an individual's "cultural identity" as Kahan and colleagues (2007) concluded. In the case at hand, is the "culture" surrounding pesticide application supportive or dismissive of certain risks, just as it may embrace or disregard certain

values (e.g., environmentalism)? While this study cannot provide definitive answers to this question, the following sections of this chapter deal more explicitly with respondents' risk perceptions.

Perceived risk of pesticides

“Then vs. now”

To many respondents, perceptions of risk from pesticides seemed to stem from the fact that the work environment facing applicators today is seen as much less “risky” than that of their fathers and grandfathers. This perceived reduction in risk was described as linked to developments in science and technology, as well as an evolving regulatory climate. Thus, an applicator in 2008, as compared to an applicator in 1978 deals with:

- Smaller quantities of less toxic, more specifically formulated products
- Increased safety information (“label expansion”)
- EPA-mandated worker protection standards (e.g., availability and use of PPE)
- State-mandated certification training and continuing education
- Increased inspections and monitoring of pesticide residues (e.g., in foods)

Yet, in addition to these benefits, contemporary applicators also potentially face a negative: the stigma associated with pesticide use. One respondent, a current state regulator and former applicator, sums up the changing regulatory climate and societal attitudes toward pesticides as such:

...I was a little kid, dragging a hose behind my dad, and eventually became an applicator... Back then we'd go out... and we'd spray trees. And you'd have drift, and it would go four, five, six houses down the road. And people would come out and say, 'Thank you!' ...And now if we did that, we would be in jail.

In describing the occupational risks they face on a daily basis, many applicators couched their responses in a reference to the situation in years past, indicating that they were automatically “better off” today than their forefathers might have been. Describing the “safe” products he handles on a daily basis, one orchard

worker claimed, "...most of the chemicals nowadays...you could pour all over yourself, and it might give you diarrhea. That's about it. There's no long-term effect."

Likewise, a commercial lawn care applicator described the "real problem" of pesticides as historical inattention to safety measures, insinuating that contemporary practices differ dramatically from those used by the farmers of yore:

...You had a farmer who's mixing up concentrates in a bucket to throw into the sprayer--no gloves...Stick his whole damn hand in there and just mix it all around...and never wash his hand or nothing [sic]. Those concentrates will go right through your skin.

Finally, one respondent, a toxicologist and public health educator, suggested that today's applicators appear to be more open to information than the sometimes-defensive generation before them:

...[Applicators are] a lot more open to understanding the concept that they *need* to know the risk information because they should be taking precautions...and that's the newer guard that we're seeing...

The next several sections will further clarify the ways in which respondents understood the risks posed by pesticides.

Risk is relative

When asked their view on the risks of pesticides, a number of respondents, both those interviewed, and those who completed questionnaires suggested that *anything*—pesticide or not—can pose risks in the right dose or at the right exposure. Many of these respondents stressed that *any* risk must be assessed within its particular context, and that many of the things we take for granted as part and parcel of daily life can prove just as, if not more, dangerous than pesticides. One pesticide safety educator elaborated on this idea in his training sessions with applicators. He described a typical lecture in which he pointed out "everyday" risks to his students:

There's a toxic dose of solanine in 200 pounds of potatoes. There's a toxic dose of caffeine in about 200 cups of coffee. Have you consumed some of those items in the past 24 hours? Most have. I said, 'Well, why aren't you dead?' *Because you haven't consumed a dose that is toxic to you, ok?*

In the words of a university turf researcher and golf course manager, who spoke of applying pesticides only very minimally, "...I think I'd be at a far greater risk for cancer eating at McDonald's everyday... or not getting exercise."

In describing how to "put risks into perspective," other respondents noted the ubiquity of pesticides in daily life, as well as the fact that "unknown" chemicals—pesticides or otherwise—lurk in many of the foods we eat and places we frequent.

According to one pesticide regulator:

...Pesticides are in every aspect of our lives. I don't think you could show me one aspect where it's not. It's in our food...agriculture, [and] it's in motels... If you're at home, people are using antibacterial soap, they're using window cleaner disinfectants...no matter where we go, pesticides are there.

Familiarity with risk

Working from Wynne's (1992) scholarship, one might posit that working with pesticides leads applicators to become "experts" at minimizing risk, while simultaneously becoming desensitized to these very same risks. Only a small number of those interviewed raised the idea that their proximity to the risk—that is, being accustomed to working with and around pesticides on a regular basis—might affect their risk perceptions. While several respondents *did* mention the fact that certain members of the public seemed to be more or less accepting of pesticides due to their degree of familiarity with this risk, fewer discussed whether *their own* familiarity might be cause for some degree of complacency. As one university applicator noted in respect to glyphosate, a commonly-used herbicide in the campus' natural areas:

...Sometimes you have to remind yourself that it is still an herbicide, it's not just water that kills plants. There's something in it... You get kind of forgetful because you *don't* get really sick from it immediately, you know, or ever...

A pesticide safety educator echoed these sentiments as in light of his view that, "the more you work with something, the more comfortable you become with it":

...My wife is a geneticist—they work with blood samples all the time. And she's always very careful with the blood and she knows what the risks are...but I look at it and say, 'Man, I'd take a lot more precaution than that!'

He continued on to use this example as an illustration of applicators' risk perceptions: "They understand the risk, but... the more you know about something, quite often the...less concerned you are."

Perceived control over risk/self-efficacy

"If used according to the label..."

A frequently voiced opinion, particularly among questionnaire respondents was the sense that pesticide risk could be easily controlled through "appropriate" safety precautions. Thus, while pesticides were perceived as posing some sort of a risk, that risk seemed to stem more directly from the applicator's behaviors, rather than the products themselves. As expressed by one questionnaire respondent, who is a supervisor at a nationwide lawn care company:

Pesticides, when used improperly, can pose a risk. As with most anything, a person must understand the correct way to complete the task at hand. Pesticides run the caution of contamination, health risks, and allergies, and the risk of destroying one's property. However, if used responsibly, the risks are close to zero.

This type of reasoning seems to follow what Kim Witte refers to as "appraisal of efficacy in light of perceived threat" (Witte, 1994, p. 232). In regard to the "perceived threat" of exposure to, and health impacts from pesticides, respondents appear to "appraise" what they can do to successfully counteract this threat. According to Witte, when perceived efficacy remains greater than perceived threat (e.g., "I know that pesticide exposure may be harmful to my health, but I can wear protective clothing and follow the approved application guidelines"), then individuals may be more likely to engage in "danger control processes." These processes, in turn, "[stimulate] actions, such as attitude, intention, or behavior changes, that reduce or diminish the threat" (Witte, 1994, p. 232). The clear sense of self-efficacy expressed by the respondents—importantly, those who applied pesticides regularly, as a main part of their job—seemed to indicate that most respondents were *not* engaging in what

Witte refers to as “defensive motivation”: “avoidant or reactant responses that control the individual’s fear” (Witte, 1994, p. 232).

Human health

Studies reviewed earlier in this thesis suggested that one’s experience with a particular risk, or the experience of his friends or family, contributes to the *availability* (Tversky & Kahneman, 1974) of that particular risk for the individual and influences both risk perceptions and related decision-making. More specifically, studies by Lichtenberg & Zimmerman (1999), Coppin, Eisenhauer, & Krannich (2002), and Perry & Bloom (1998) suggested that direct experience with pesticides—or those affected by pesticides—could significantly impact concerns about pesticides and health. To explore these ideas in the current study, respondents were encouraged to talk about their own personal experience and/or the experience of a family member, colleague, or friend with pesticide-related illness. In so doing, some respondents also brought up instances in which their (or a close other’s) exposure to pesticides did *not* result in any visible bodily harm. The following discussion attempts to sort out the wide differences in reactions among the respondents interviewed.

Salience

A small number of respondents shared that they, or a close associate, had suffered from an illness conceivably related to pesticide exposure. Despite their proximity to the issue, some of these respondents nonetheless seemed hesitant to argue for a clear link between pesticides and human health. As one respondent, a pesticide regulator, described:

...My uncle used to work at one of the local orchards where I’m from and back...in...the 60s...they used to spray in shorts... They’d laugh about how their chest would be tight and their teeth would be loose and... a lot of those guys lived a full, healthy life, never had a problem. A couple of those guys died of cancer.

In the same vein, a turf researcher spoke of the loss of a close friend to cancer, his uncertainty about the role pesticides play in human illness, and the need to reduce chemical use in general. He remarked:

...People think, ‘Well of course you’re going to say [pesticides are] no big deal...you make a living off of this business.’ Well, yeah--but I got a wife and kids... and my best friend just died of breast cancer and I’m really concerned...

(Interestingly, one respondent referred to having had a grandmother die from breast cancer, yet used this instance as a way to strengthen his belief in the “*safety*” of “chemicals” in general, such as pesticides. This employee of a nationwide lawn care firm described his grandmother as having lived in a “little coal town in Pottsville, PA” where she “never saw a chemical in her entire life... But yet she ended up with breast cancer and died from it.” For him, this instance seemed to reaffirm his perception of cancer as random and unpredictable, rather than directly linked to some kind of exposure.)

Other respondents knew of no friend, relative, or colleague who had suffered from any (potentially) pesticide-related illness or injury yet, despite this fact, still maintained some degree of cautiousness around chemicals. One owner of a local lawn care firm explained:

[Being exposed to pesticides] really didn’t bother me because...my father had been in the business for a long time and he’d been working with worse products than I had... DDT and chlordane...I really don’t know whether these do...cause cancer. I mean, I’ve worked around a lot of them and I’ve never had any problems. My dad is 87 years old and he’s never had any trouble.

Other respondents appeared hesitant to immediately attribute any sickness they had experienced to pesticide exposure, yet nonetheless considered this fact quite seriously, and often frequently. This uncertainty led some respondents in a cycle of continually questioning whether a sore throat or eye irritation was caused by, for example, hay fever or Roundup®—referred to by one applicator as “paranoia” and another as a “psychosomatic” response. As one head university groundskeeper

recounted:

... Sometimes when I was spraying Roundup® there were times it was like, 'Does that lymph node feel funny?,' ...after I had sprayed like a lot of projects on a particular day.

Likewise, an applicator in a university natural area expressed that:

...I had like mild irritation in one of my eyes and...it happened to be the same day that I did some spraying.... It was a hot day so...[it] definitely worried me that somehow, something was on my forehead and sweated into my eye ... You get a little more paranoid when you work.

To maintain their daily jobs, however, most respondents seemed able to keep this questioning at bay. A university groundsperson explained, "You wonder what...could be the long term effect... I don't stay up at night worrying about it, though."

Another way that some respondents "rationalized" the effect of occupational pesticide exposure on their bodies seemed to be through viewing each individual as uniquely affected (or unaffected) by chemical. In this respect, some respondents rejected the concept of one accepted baseline prediction about the effects of pesticides on all people. As one questionnaire respondent, an applicator for a nationwide lawn care service put it, "Some people are more sensitive to chemicals than others, and they should be maybe more careful than others. However, pesticides alone do not pose a risk." An owner of a local lawn care firm agreed, stating, "I know people are different, and some things affect people differently than other things." A turf researcher took this concept one step further, suggesting that, while all human bodies can "process" chemicals, not all will do so equally effectively. He said:

...I think our bodies are designed to live in a world of environmental contaminants... Everything that's exposed to the natural environment is constantly regenerating. Do I think that some people are more susceptible to the constant irritation of chemicals than others? Yeah, I do.

In this sense, the focus seemed to become the *body* itself, rather than the chemical to which it is exposed.

Others seemed to characterize their own experience of pesticide-related illness as an isolated, controllable instance, again *de-emphasizing* the chemical and the hazard posed. Several respondents blamed themselves, describing these instances as related to their own poor decisions. One orchard worker chalked his one-time skin irritation to youthful indiscretion:

I sprayed a lot at college...I was a foolish kid, and inexperienced ...Walking through a greenhouse after you spray without your proper attire. And that was my own stupidity, and [I] never did it again.

Again indicating their perceived self-efficacy and *control* over risk (recall Witte), other respondents noted that products causing problems could be easily replaced, thus eliminating the source of the concern. One university orchard manager described an incident several years ago involving a particular product that gave workers a rash and diarrhea:

...It was very obvious...every guy got it, every time we used it. Problem was, the material was great; you only had to apply it once and it worked for months and months...So that was the worst... but it was just a rash... discomfort; it wasn't something really toxic.

A manager of an indoor pest control regional firm echoed this sentiment while discussing a "pyrethroid class chemical" his firm once used: "...We found a pattern of skin irritation... We got rid of the product, and we also got rid of the itching rash problem." Thus, by exercising agency in product selection, these managers perceived themselves as able to minimize, and even effectively eliminate, the risk.

Optimistic bias

Some respondents were exposed to pesticides, and knew others who had been, too, yet their own (and their relatives,' friends,' or colleagues') good health seemed to contribute to an inflated sense of confidence in their own ability to avoid harm, an effect referred to in the risk communication literature as "optimistic bias." In regard to taking personal risks, "When asked about their own chances, people claim that they are less likely to be affected than their peers" (Weinstein, 1989, p. 1232). Having

remained unaffected by pesticides, and without any affected friends or relatives, some of these individuals seemed to display braggadocio or even machismo. One applicator, an employee of a nationwide lawn care firm, claimed that he had never experienced any health effects attributable to the products he applied. He noted:

I inject trees with fungicides and insecticides and [the product] has a skull and crossbones on the bottle. One pin drop on your skin will knock you flat out...I've used all that stuff. It's not like I haven't been around chemicals.

Likewise, a manager/applicator of a regional lawn care service firm remarked:

I started making applications when I was in grammar school on my father's property. I've been exposed to more pesticides than most people will ever see. I've been exposed to things that are now totally illegal and outlawed and never used *half* the safety measures we use today.

This respondent noted that he and his peers, individuals likewise exposed to dangerous chemicals without safety precautions, had not experienced any negative health problems other than “the normal stuff...overweight or something like that.” He continued, describing the generation of applicators before him as spraying trees with “stuff coming down on them in buckets.” Having watched these individuals continue working well into their eighties and nineties, he ultimately came to reject the connection between pesticides and illness: “...You just sit there and shake your head and say, ‘You know, this is a lot of hogwash.’ I don’t go along with any of it.”

Perception of Western science

Skepticism, lack of trust, uncertainty

Earlier in this thesis, I argued that pesticide exposure may be aptly described as “invisible,” and that rendering the causative connection between pesticides and human illness “visible” requires not just scientific “fact,” but also the particular alignment of sociopolitical and historical conditions (Murphy, 2006). Many respondents, educators, managers, and applicators alike, were skeptical about a clear link between pesticides and human illness. A number of these respondents related their skepticism to the idea that scientists lack the appropriate data to make a definitive conclusion regarding

“safety.” While many of these individuals seemed acquainted with, as well as respectful of, the work done by the “scientists” (broadly construed), they nonetheless felt that more research was necessary to provide a convincing case. One head groundsperson in a school district was on the fence regarding the relationship the link between pesticides and cancer:

...I don’t think there’s enough information yet, but it’s my understanding that this data’s working on that, especially down in Long Island...They’re trying to track pesticide use through commercial applicators. So they keep track of what we use, and they’re trying to find a link. And it’s possible that there could be.

While unsure about the significance of the findings, this applicator nonetheless seemed to respect the scientists’ work. An applicator/university turf researcher agreed, adding that this element of uncertainty makes the choice to be exposed to pesticides in an occupational setting a very personal decision. (Recall that the acceptance of occupational risk was highlighted as a trait of a “successful applicator” in part two of this chapter.) She noted:

...I don’t think anyone can say, ‘This will or will not give you cancer if you use this pesticide.’...I don’t know, you don’t know, you have to decide for yourself...

Due to her uncertainty about whether pesticides cause illness, she added that, if faced with an employee who expressed discomfort at spraying a certain pesticide, “I wouldn’t say, ‘You’re fired’... I’d do it or I wouldn’t make somebody do it if that’s how they feel ‘cause I can’t tell them for certain it’s not.” Another respondent, an applicator spraying on state land, expressed his uncertainty in terms of *his own* understanding of the science, rather than that of the scientists. Stressing several times throughout the conversation that he “did not know for sure,” he commented on the possible effects of pesticides on the human body as such:

... I’m figuring anything that attacks amino acids...and our bodies are made up of amino acids...it’s a good chance they could cause...birth defects or...maybe speed up...the diseases of our elderly—maybe cancer, or multiple sclerosis.

Another respondent, a state regulator, used uncertainty to justify *not* publicizing a

causative relationship between pesticides and cancer:

...To come out and say that any one thing creates cancer I think is *bad*... Well, maybe, they might, you're right...who knows? But you've got to be predisposed. Maybe ...all those plastics and all that stuff, maybe that's what gives you cancer...I'm skeptical.

He continued, remarking that the general public expects the line between chemicals and illness to be *visible*: etched clearly in stone, writ large on the label. To illustrate, clearly parodying an uninformed consumer (recall "Joe Homeowner"), he exclaimed, "*Oh my God... they sprayed the turf next to me and they gave me cancer!*" Finally, one respondent, a manager of a regional lawn care firm, described his skepticism about the link between pesticides and illness as a function of his lack of trust in the scientists themselves. Suggesting that certain scientists are corrupt, carrying out counterproductive agendas, he explained:

... You get this game they play. The researcher will talk to anybody but another researcher and they won't let you see the information. They'll talk to any paper, or any citizen's group, just riling everybody up and then when [the other researchers] finally do get the information they find out the guy was bogus to begin with.

Similarly, an applicator working on state lands, described the "process" of scientific discovery, whether intellectual or institutional (or both), disparagingly:

One year [scientists will] say a chemical's bad for you, and the next year they'll say it's ok... just by changing the numbers they become usually dramatically different than it was the year before...

Trust in science/scientists/regulatory system

Some respondents couched their discussion of science and scientists in their trust of the system that regulates the chemicals themselves. For example, one respondent, the head groundsperson of a town school district, seemed to trust "them"—in this case, the EPA and the DEC—to pull chemicals off the market that are deemed dangerous through research. (Recall earlier discussion of EPA's registration process as presenting a transparent picture of scientific properties of a particular pesticide, as well as the expected human health risks.) In reference to the ongoing

study of pesticides and cancer incidences in Long Island, NY, this individual stated:
...If they did [the study] over 10, 15, 20 years, and found some sort of a link, they'd ...pull the pesticide and say, 'Look, we found this link.' ...And then if something happened to me and they said, 'Roundup® hurt you' ...I'd say, 'Well, yeah, could be.'

Similarly, another respondent, a manager of an indoor pest control firm, had personal reasons for trusting the pesticide registration system, noting that his confidence in the registration process was a result of his own membership on the state registration committee. In this same vein, another respondent's trust in the safety of pesticides followed from his high regard for the *institution* carrying out the studies. The respondent, ironically a former national lawn care chain employee and current applicator for another regional chain, remarked:

[National lawn care chain] did extensive studies to find out that once they sprayed that stuff ...and it dried, you could roll around in it, you could rub your fingers across the leaf surface—you're not gonna pick it up. It's adhered. It's not going any place.

Trust in actors like a national lawn care firm's scientists, or one's own boss, can also justify one's own lack of understanding of the technical elements of the underlying science. When asked whether he should be able to address the public's questions regarding the materials he applies, one university orchard worker replied affirmatively:

A good applicator should know most questions...[but] There's gonna be the chemical breakdown [of the pesticide]—nobody needs to know that! I don't want to know it! Useless information in my eyes. Does it work? Does it do the job? And is it safe?

To this individual, the pesticide's "invisible effects" ("chemical breakdown") become irrelevant ("useless") in light of the more immediate questions—will the product work, and how "safely"? Elsewhere in the conversation, it became clear that this individual trusted his boss, along with other university health and safety representatives to provide him answers to these questions, making the first question moot. Such a reaction is reminiscent of Wynne and colleagues' (1995) conception of

“social construction of ignorance”: the idea that individuals may actively justify their ignorance of more complex scientific phenomena on the grounds of stabilizing and protecting existing social relationships in the workplace. As Wynne (1995, p. 380) sums up, “Technical ignorance thus becomes a function of *social* intelligence, indeed of an *understanding* of science in the sense of its institutional dimensions.”

Given that the majority of the respondents were both white and male, this apparent trust in regulators and the general regulatory “system” seemed to contradict the some of the findings that Finucane et al. (2000) ascribe to a “white male effect.” Whereas Finucane and colleagues reported that white males appear to be “less trusting of government” and more likely to “disagree that the federal government can be trusted to properly manage the risks from technology” (Finucane et al., 2000, p. 167), the respondents quoted above may be bucking this trend. Moreover, elsewhere in their analysis, the authors suggest that white males can be expected to have “more confidence in experts and less confidence in public-dominated social positions” (Finucane et al., 2000, p. 170); however, given the skepticism expressed by many respondents regarding scientists’ work and the process of science, it is clear that applicators do not uniformly and unquestioningly trust these “experts.”

As the quotations in this chapter have illustrated, respondents appear to be characteristically divided on issues of risk and science: both trusting and skeptical, convinced and concerned. To offer one straightforward explanation, this difference in attitude/opinion may be attributed to the fact that the study population was a “loose collectivity,” rather than a “uniform” sample of individuals with identical backgrounds; in following, a variety of different “cultural worldviews” would be both presented and “protected” (Kahan et al., 2007). Discerning the degree to which “identity protective behavior” plays a role in determining views towards pesticide

risks will require more systematic study of targeted demographic groups, and, while clearly relevant, is beyond the scope of this thesis.

Having presented and analyzed the major results of this study, I now turn to Chapter Five, the conclusion, both to tie together these findings, and to reflect on areas for future research on and development of the ARC concept.

CHAPTER FIVE:

CONCLUSION & IMPLICATIONS

Summary: Case overview and methods

The preceding four chapters have worked toward two goals: first, describing a specific case study of how certified pesticide applicators communicate risk-related information to their clients and the greater public and second, illustrating how these individuals may be thought of as exemplary accidental risk communicators (ARCs). Chapter One provided a snapshot of the substantive issues surrounding the case, including the regulations underlying pesticide applicator certification in the state of New York. More broadly, this chapter also introduced the idea of an accidental risk communicator as an individual tasked with relaying risk information, though not necessarily in a formally recognized manner. Chapter Two reviewed the literature pertinent to the ARC concept, borrowing from the risk communication, science and technology studies, and management disciplines. Using these diverse angles, I reviewed several theoretical concepts I thought to be central to understanding ARCs, including: technical and cultural rationality, expertise, invisibility, emotional labor, perceptions of risk, and heuristic biases. While these concepts were identified prior to the study, in following a grounded theory approach, I assumed that other concepts and themes would also emerge from the data itself.

Between June and November 2007, 29 in-depth interviews were completed with a “loose collectivity” (Weiss, 1994, p. 19) of respondents affiliated with the Green Industry. Respondents were identified most often via “snowball sampling,” but also through Yellow Pages and other directory listings of local Green Industry affiliates (e.g., landscape companies, school districts, university grounds departments, etc.). Of the 29 individuals, for the sake of comparison, three representatives from the indoor pest control industry were included. In addition to the interviews, I collected

short written questionnaires from a total of 24 respondents at the 2007 Empire State Green Industry Show. All respondents were affiliated with the Green Industry (e.g., landscaping, turf/lawn care, municipal parks, etc.), and the questions were designed to cover the main areas of the in-depth interviews. Interviews were recorded and transcribed, then coded line-by-line both by hand and with Atlas.ti qualitative data analysis software. (Questionnaire responses were coded similarly.)

Before reviewing the study's results, I will first recognize its limitations.

Limitations

Generalizability & validity

As mentioned in Chapter Three, the qualitative nature of this study emphasized validity over generalizability. Because respondents were selected from such a narrow, purposive sample, one might argue that the results described in these pages are meaningless beyond this singular group of individuals; however, even within this limited sample, certain results emerged which seemed to correspond with widely accepted theories within risk communication (e.g., danger control; optimistic bias) and social psychology (e.g., downward comparison theory), as well as science and technology studies (e.g., social construction of ignorance). One must also bear in mind that the purpose of this study was not to produce a generalizable body of data, but rather to explore a set of open-ended questions for the purpose of developing a new theoretical construct. Given this exploratory aim, the actual data that emerged was, perhaps, even less important than the subsequent research questions generated. (These questions are presented in more depth later in this chapter.)

Qualitative researchers have noted that spending a prolonged period in the field—in other words, immersing oneself in the setting and culture—can contribute to the validity of one's findings (Creswell, 2003). Rather than adopt this “ethnographer” approach, I was limited to one-time in-depth interviews, most often with individuals I

had never met before. Arguably, by spending more time surrounded by the Green Industry “culture” (e.g., through participant observation in different pesticide application firms) I might have come to understand the profession (and the role of risk communication) more deeply. Moreover, first hand experience with “applicators in action” might have served as a powerful “check” on the validity of the responses gathered from those “once removed” from the applicator profession, such as managers, pesticide safety educators, and regulators. I will next explore this tension between “firsthand” and “secondhand” accounts.

“Skewed” sample

The heterogeneous mix of respondents may have contributed to a somewhat biased picture of the applicator’s experience. By selecting a purposive sample of respondents, I hoped to include a diverse set of turf and lawn care applicators from many work settings, including national firms, local businesses, and schools/universities. Due to the institutional barriers encountered in interviewing certain individuals, however, I came to rely quite heavily on the impressions of those *closest to* the applicators (e.g., pesticide safety educators). While many of these individuals had strong ties to the Green Industry and experience interacting one-on-one with applicators (such as through teaching certification trainings), they nonetheless were often speaking of their impressions, rather than firsthand experiences applying commercial pesticides. In other words, while I had hoped to elicit direct information about applicators’ “internal states”—that is, their “mental and emotional functioning...thoughts, and...feelings” (Weiss, 1994, p. 7) in regard to their jobs—I often received secondhand or even “guttled” interpretations of these feelings. While I benefited from hearing the perspectives of individuals like pesticide safety educators and high level managers, I nonetheless felt that their responses might have come to overshadow those of the applicators in the sample. These individuals spoke very

compellingly about the general issues surrounding the applicator's experience (e.g., dealing with regulations), yet sometimes seemed less able to articulate the more *specific, day-to-day* reality of this job (e.g., dealing with a particular neighbor). As such, these respondents were more likely to make broad observations than tell particular stories. This tendency away from detail-rich narrative (i.e., telling stories about one's own experience) towards more general reporting (i.e., commenting on the experience of another) might have limited the "thick description" of the sort championed by qualitative researchers.

"Getting in"

Prompting this "skewing" of the study sample, as mentioned earlier in this thesis, was the problem of "getting in" or "gaining entrée" to certain groups or organizations. Lofland et al. (2006, p.41) note that gaining entrée to "scenes skewed towards the private end of the continuum" is far more complicated and potentially problematic than accessing "public spaces." Following this line of reasoning, one might predict that securing an interview with a public university employee would involve negotiating less "red tape" than doing so with a worker at a private company. While this was true of my experience with large firms (as previously noted in regard to ChemLawn), I found local lawn care companies to be much more open to and trusting of my research. Through my limited interaction with the larger, national firms, I came to understand that the hesitation with which they received my request might have been motivated by the lingering stigma surrounding pesticide use in the United States. Having dealt with lawsuits and naysayers, protesters and cancer clusters, they seemed to position themselves immediately on the defensive; how were they to trust that I would not generate more ill will towards the industry? That these respondents may have assumed I had a "covert" agenda brings to mind the assertion of Julius Roth that, "all research is secretive in some ways and to some degree—we never tell the subjects

‘everything’” (Roth as cited in Lofland et al., 2006, p. 40). Despite my attempt to make my objectives transparent, the ways in which my potential respondents and I understood these goals were not easily reconciled. In this way, Lofland and colleagues (2006) remind us that the researcher is never fully “overt” or “covert” in his relationship with respondents, nor in how he makes his needs and intentions known. One must account for these considerations in future studies with ARC populations where establishing a purposive sample requires interacting with private-sector, possibly socially stigmatized, groups of people.

Results

Based on the literature review and the grounded theory approach, I used four broad research questions to guide my data collection. The following is a summary of the results relevant to each question, as they were identified in Chapter Four of this thesis.

RQ 1: How do CPAs perceive their job? That is, how do they make sense of the role they (do or do not) play in delivering risk-related information?

Institutional culture

- Depending on their institutional attachment, CPAs face real constraints in terms of the time allocated to address questions or concerns; however, many would agree that “taking the time” with customers or other members of the public is a crucial element in establishing trust between the public and the applicator.
- Several facets of the Green Industry, especially turf and lawn care, deal with issues of seasonality and frequent worker turnover, factors which may influence how much a boss or supervisor decides to invest in worker training.
- Respondents described various methods of written communication with clients, such as “bulletins,” newsletters, and bills. These gestures were thought of as

providing not just substantive information, but also a psychological service for which the clients paid.

- Phone operators (receptionists, client relations personnel, etc.) often serve as the “first line of communication” with the public, in that they must address a wide variety of questions and concerns that filter through the firm’s main switchboard. Given this critical role—arguably as ARCs themselves—some respondents felt that these individuals should undergo both classroom and field-based training similar to that required by certified applicators.
- For some respondents, a close relationship with their clients was particularly important. Others discussed their personal connection to their work (e.g., through family or alumni connections) as fostering a distinct sense of pride.

Methods of training

- Experience-based or informal training, such as through working under direct supervision may fulfill legal or institutional requirements, but also seems to play an educational role.
- The variety of non state-mandated training (e.g., outside workshops, in-house seminars, safety demonstrations) made available (or mandatory) to employees can vary considerably between institutions. Subjects covered appear to run the gamut, from substantive information (e.g., insect biology) to public relations-type training (e.g., interacting face-to-face with customers).
- When in need of more information about a particular product they apply or a possible health concern, respondents turn to a variety of sources, including: Cooperative Extension, government, non-governmental organizations (NGO), Internet/print media, pesticide manufacturers, and other individuals.

The “successful” applicator

- In contrast to the image presented at the beginning of this thesis, respondents did not see the “successful” applicator as embodying the anti-social, introverted “Marlboro Man” image.
- Some of the most frequently cited traits of the “successful” applicator included: the ability to accept occupational risk, honesty, being levelheaded (laid-back), and flexibility. Importantly, respondents seemed to suggest that a successful employee must learn to “manage” his or her emotions (Hochschild, 1983; Rafaeli & Sutton, 1987) as well as develop “common sense” (understood generally as courtesy or concern) towards the customer. Other traits mentioned including being “hardworking,” self-motivated, and looking to pursue a career in the Green Industry.
- Among the frequently cited skills of a “successful” applicator were: having substantive information (e.g., background in botany), people skills and the ability to communicate, problem-solving or technical ability, and test taking ability.
- That this diversity of traits and skills is seen as mapped onto the job description of a “successful” applicator suggests that the role is far from one-dimensional, physical labor.

Job perceptions and role of the applicator

- Some respondents characterized the role of the applicator as that of a “professional.” Respondents seemed to use this term to refer to a “higher” ethical and working standard that could, in many cases, be achieved through proper training. Notably, having a “professional” sense could involve understanding the role of pesticide application more holistically—for example, recognizing the *benefits* of applying pesticides to landscapes. Moreover, the applicator him or

herself was seen as having a clear sense of *agency* and *responsibility* above that which is typically afforded to him/her.

- Several respondents referred to the role of the applicator as an “educator,” though this view was most predominant among those affiliated with universities. Importantly, several respondents saw this role as offering a distinctly persuasive opportunity to change both *opinions* and *behaviors*.
- Other respondents saw applicators as fulfilling a public relations or service industry-type role. In some sense, applicators were thus seen as “selling” an image of the Green Industry, especially in a rhetorical sense.
- A few respondents saw applicators as “consultants” to clients, though this role was seen as somewhat restricted to the more expensive Green Industry firms. In this conception of their role, applicators were seen less as “selling,” but rather as engaging in two-way dialogue with their clients.
- While respondents seemed to have a number of meanings for the term “risk communicator,” those who used the term at all tended to be individuals who were distanced from the actual day-to-day pesticide applicator occupation. Among these respondents, “risk communication” seemed to imply either “public relations or service work” or “exercising empathy.” Part of the work of “exercising empathy” seemed to be acknowledging the fears and concerns of the public—however “trivial— a challenge not unlike what both Hochschild (1983) and Rafaeli & Sutton (1987) describe as pertaining to “emotion work.”
- A handful of respondents warned that applicators should not be expected to fulfill roles outside of those “explicitly” linked to their job description. Whether or not this opinion would be in conflict with the aforementioned concept of “professionalism” remains unclear.

RQ 2: How do CPAs make decisions about *when*, *what*, and *how* to communicate with their clients and the general public about pesticide-related risks? And, what factors contribute to this decision-making process?

Perceptions of the public

- The concept of “Joe Homeowner” was used by a number of respondents to refer to a stereotypical member of the public with purchasing power, yet not necessarily the training to deal responsibly with home lawn/garden pesticides. That many respondents used this caricature disparagingly may be due, in part, to the fact that this legal situation seems to discredit the certified applicator. Moreover, the allusion to “Joe Homeowner” may be filtering down through training sessions led by university pesticide educators, or through the rhetoric of Green Industry affiliates.
- Respondents also described interacting with members of the public who they perceived as having “an agenda”—often in relation to environmental issues. These individuals described being frustrated by the exaggerated attention commanded by these citizens, whom many respondents perceived as not having the expertise to be making the pronouncements (in regard to pesticide use) that they did. Ultimately, the ability to balance these motivated interest groups could be described as an “invisible” or “embedded” (Star & Strauss, 1999) aspect of the applicator’s role.

Receiving questions from the public

- Respondents noted that applicators tend to receive questions that can be grouped into four general categories: the 5Ws: who, what, where, when, why, (how); general safety and precautionary behavior; general health; and pets and kids.

Addressing questions from the public

- Citing institutional mandates, several respondents (almost exclusively those affiliated with universities) noted that they almost never came into contact with

people when applying pesticides, due to the time of day they were they were working. Lacking the physical presence of the applicator, the public is left to rely on the “physical traces” (Star & Strauss, 1999) left behind, such as posted signs.

- According to several respondents, certain protocols are followed in answering clients’ or the greater publics’ questions. Depending on its nature, a question may be automatically “deferred” from the applicator to an administrative superior. Certain firms also employ communication strategies such as constant cell-phone contact, in order to ensure that both applicators and managers are kept abreast of emerging issues.
- Some respondents noted that they tend to “avoid certain words” when communicating with clients, such as “safe.” In addition to serving as “active listeners,” exercising empathy, and/or “managing” their own emotions, applicators also seem to be placed in the position of communicating complex, uncertain science.

RQ 3: How do CPAs perceive, evaluate, and position pesticide-based risks? Namely, what are the dominant stories and themes used to characterize, make sense of, and discuss pesticide-related risks?

Self vs. others

- Many respondents seemed to distinguish themselves as separate from, and superior to “the competition.” While this appears to be an enactment of the downward comparison theory, it is unclear whether (or why) respondents might be motivated to adopt this sort of rhetoric; also uncertain is the role that *stigma* plays (e.g., working for a stigmatized industry) in motivating this type of response.

Environmental views

- Knowledge of the environmental risks posed by pesticides, as well as awareness of alternatives to pesticides (such as IPM) seemed to be high among respondents.

Due to the small size of the sample, I cannot make any conclusions about possible differences in perception between men and women; instead, it may be more important to interpret this understanding in light of the culture surrounding the pesticide applicator's work (Kahan et al., 2007).

Perceived risk of pesticides

- Many respondents couched perceptions of pesticide-related in reference to the technical and legislative climate of the past; present conditions were seen as being automatically superior to past conditions, and thus posing less risk.
- The idea that risk is “relative”—that virtually anything can pose a risk in applied in the right dose or at the right exposure—came up quite frequently among respondents.
- Only a few respondents referred to their own familiarity with the risks posed by their job as creating a sense of “complacency.”

Perceived control over risk/self-efficacy

- A popular sentiment among respondents was the idea that individuals could control the degree of risk to which they were exposed by strict adherence to the pesticide label. Such reasoning seems in line with Witte's (1994) notion of the relationship between self-efficacy and so-called “danger control” processes.

Human health

- Respondents described a variety of reactions to their own (or a close other's) experience of health effects from pesticides, ranging from concern (“paranoia” or “psychosomatic” response) to skepticism to braggadocio. While salience, or the availability heuristic (Tversky & Kahneman, 1974) likely played a role in these responses, just how respondents came to react one way or another was less clear/predictable. Some respondents viewed past exposures to pesticides (and

ensuing health issues) as isolated, controllable instances, again emphasizing the role of self-efficacy in risk perception.

- Some respondents characterized their own (or a close other's) exposure to pesticides as *not* leading to negative health effects. In some cases, this association seemed to allow individuals a (perhaps) falsely inflated sense of confidence in their safety, an effect that corresponds to “optimistic bias.”

Perception of Western science

- Many respondents (ranging from applicators, to pesticide safety educators, to regulators) expressed skepticism in regard to the link between pesticides and human health issues.
- Trust in both the scientific process and its actors (both broadly-construed) ranged widely among respondents, from those who saw scientists as manipulative and untrustworthy, to those who respected the work scientists performed. Some respondents mentioned having confidence in the regulatory process (e.g., EPA registration of pesticides).

Theoretical implications & future research

Clearly, the results just presented offer a multitude of avenues for future research into the ARC concept. For the purposes of this thesis, however, I will argue that three bodies of literature deserve particular attention in terms of their potential for generating research questions that build off these results. The following sections review emotion work, background work/invisibility, and experience-based expertise, each presenting questions worthy of future study.

Emotion work

“The funeral parlor director, the doctor, the complaints clerk, the day-care worker all apply a sense of ‘should’ to the situated feelings that emerge in the course of a week. How do these ‘shoulds’ differ?” (Hochschild, 1979, p. 572).

Throughout the results section, there were many indications of the “emotional labor” (Hochschild, 1979; 1983) as well as “emotional management” (Rafaeli & Sutton, 1987) required of applicators. Between masking their own disapproval at the reaction of a panicked client, to acknowledging concerns, to listening without judgment, applicators seemed to perform many of the role requirements described in case studies of flight attendants (Hochschild, 1983), sales clerks (Rafaeli, 1989), and even white water rafting guides (Price, Arnould, & Tierney, 1995). Positioned most centrally in the marketing and management literature, the emotional labor/management concepts have been principally researched in relation to *worker effectiveness*—i.e., how the performance of particular workers becomes linked to their ability (or inability) to show (or mask) accepted emotions in face-to-face communication. In following, much of the literature has used qualitative case studies to show emotional labor/management as an avenue to improve service interactions, thus working as a social influence to prompt clients to spend more (or to pay more for the products or services offered) (e.g., Rafaeli, 1989; Sutton & Rafaeli, 1988), or even to pay overdue bills (Rafaeli & Sutton, 1991; Sutton, 1991).

Several strands of research within this body of literature deserve mention in relation to future ARC research. First, Morris & Feldman (1996) conceptualize “emotional labor” as consisting of four main dimensions: frequency of appropriate emotional display, attentiveness to required display rules, variety of emotions to be displayed, and emotional dissonance. While these dimensions have been applied to service jobs, such as retail clerks, it is unclear whether (or how) they might fit into a characterization of the ARC role.

Second, in a case study of the work of river rafting guides, Price, Arnould, & Tierney (1995) present a typology of emotion work based on three dimensions: *duration* of the encounter with a member of the public, *affective content* of the encounter, and *spatial proximity* to the member of the public. The authors argue that certain occupations, such as river rafting guides, place individuals in “extended, affectively-charged, intimate encounters,” in that the work requires extreme levels of all three dimensions. Such a model might be useful in mapping out ARC exemplars, so as to better characterize the occupational role requirements.

As opposed to focusing on the performance of emotion work, a third study by Opengart (2005) suggests that the concept of emotional labor be understood both from a psychological (micro) and sociological (macro) level, in that *individuals* as well as *context* are both at play. According to the author, any given employee’s “emotional intelligence” should be assessed and, if necessary, improved prior to performing the emotion work required of his or her job. Conceivably, one might see an ARC’s role as contingent upon both institutional norms (macro level) and cognitive ability (micro level).

Finally, several researchers have commented on the links between emotional labor and Erving Goffman’s (1959) dramaturgical perspective. As Ashforth & Humphrey (1993, p. 90) sum up, “The laborer is viewed as an actor performing on stage for an often discriminating audience.” If an ARC is seen as “performing” for a discriminating public, might he or she be more apt to elevate his or her own self-worth, as was described in the discussion of downward comparison theory?

Extrapolating from these lines of inquiry, and as alluded to in the results of this study, are the following questions:

- What is the role of emotional labor/management in effective risk communication in informal settings, such as impromptu face-to-face conversations that ARCs will

likely be engaged in? How are the “dimensions” of emotional labor (Morris & Feldman, 1996) expressed in an ARC’s job? And, what is the relationship between “customer service” and risk communication, and/or can they be thought of as one-in-the-same?

- Can the emotion work of ARCs be classified on the basis of “duration,” “affective content,” and “spacial proximity” with the public? Do certain (any) ARC occupations fit the classification of “extended, affectively-charged, intimate encounters”? (Price, Arnould, & Tierney, 1995). If so, which one(s), and how?
- On an individual (psychological) level, does an ARC’s occupation require a certain degree of “emotional intelligence” (Oppengart, 2005)? If so, can this ability be taught (and) how?
- To what extent can the work of the ARC be described as “performance” (Ashforth & Humphrey, 1993)?

Through the interviews in this study, we have seen some indication that the emotion work that applicators may be “performing” is highly regarded (and seen as important); what is less clear is the degree to which applicators, and other ARCs, are formally recognized, rewarded, and compensated for these tasks. The following section explores how notions of “background work” and “invisibility” may inform future research.

Background work/invisibility

“Work may become expected, part of the background, and invisible by virtue of routine (and social status). If one looked, one *could* literally see the work being done—but the taken for granted status means that it is functionally invisible” (Star & Strauss, 1999, p. 20).

As described earlier in this thesis, research in the diverse realms of medical care (e.g., informal caregiving, nursing) and computer-supported cooperative work has pointed to both the benefits and the drawbacks of formalizing or “disembedding” (Star & Strauss, 1999) previously unrecognized work. The problem with “background” or “invisible work”—that is, work that goes “unnoticed” or “unrepresented” in traditional

systems— is that “it cannot be evaluated, accounted for, and/or rewarded” (Bowker, Star, & Spasser, 2001). Addressing issues of power and marginality (i.e., being outside of an established network) much of the literature focuses on various means of “formalization” such as creating elaborate classification systems and descriptive typologies of work. In regard to the nursing profession, Star & Strauss (1999, p. 15) refer to this “disembedding” project as an attempt “to change work previously embedded under a general rubric of ‘care,’ and usually taken-for-granted into work that is legitimate, individuated and traceable across settings.” Take the half an hour spent comforting a patient recently diagnosed with cancer, or the particular way in which a medication is prepared; instead of dissolving into the flow of daily work, each task is singled out and recorded, and recognized for its intrinsic worth.

On the positive end, the process of formalizing occupational roles—through computer-mediated classification systems and other forms of documentation—serves to safeguard particular, situated knowledge. Bowker, Star, & Spasser (2001) suggest that this historical record of the “best practices” of a trade—whether of how to console a patient, or describe the risks of pesticides—can then be built upon and “[linked] to current practice.” Moreover, codifying occupational tasks can help to represent a job as “atomic, indivisible units” (Bowker, Star, & Spasser, 2001), providing increased recognition and (hopefully) compensation. This urge to subdivide and classify again reflects the authors’ claim that, “Only work that is visible can truly be identified as valuable.” In this sense, one might argue that ARCs be recognized (according to one respondent in this study) not just as technicians or service workers, but also as (risk) *communicators*, and paid as such.

Lest we begin a revolution of codification, however, the literature also posits certain possible negative effects of “disembedding” all work. For one thing, work may be “invisible” for a reason: for some individuals, a classification system can

never fully encompass the nature of their work. To use the current study as an example, how might we best characterize the “work” of exercising “common sense” and, in following, on what basis would compensation be given? Secondly, once the “invisible” is rendered visible, it is often more vulnerable to the processes of “re-engineering” by those with more power (Star & Strauss, 1999). Again, using this case study, once management is aware of the degree to which certain applicators speak with clients, they might be more likely to enact systems to *limit* or *re-distribute* this responsibility. In this way, ARCs could be conceivably stripped of the agency that they had once exercised. As we learn from Star & Strauss’ (1999, p. 21) case study:

Nurses struggle to be visible, but simultaneously to hold areas of ambiguity and of discretion. It is one thing to note that one has given counseling to a dying patient; quite another to specify the words one would say to that patient.

Given, as Star & Strauss (1999) seem to suggest, that there can be “good invisibility” and “bad invisibility,” rather than one “absolute” designation of its worth, the following research questions arise:

- In what way(s) might we “formalize” the risk communication task that ARCs perform?
- To what extent can “disembedding” the risk communication role of ARCs be described as enacting *positive* change (e.g., on the worker himself, on the institution, on the public, etc.)?
- To what extent can “disembedding” the risk communication role of ARCs be described as enacting *negative* change?

Stemming from this idea of making prominent the formerly “invisible” is the question of the role an ARC might conceivably play in decision-making, the subject of the next section.

Experience-based expertise

“The job...is to start to think about how different kinds of expertise should be combined to make decisions in different kinds of science and in different kinds of cultural enterprise” (Collins & Evans, 2002, p. 271).

“Credentialed” by the state certification program, and possessing first-hand “experienced-based expertise” (Collins & Evans, 2002), pesticide applicators can be viewed as both *experts* and (as has been demonstrated in this thesis) *professionals*. This mixture of formal and informal training, experience, and credentialing led many respondents to perceive themselves as better equipped to deal with pesticide application than the typical “Joe Homeowner.” Moreover, applicators also often feel frustrated by the pesticide-related legislation they are forced to follow, yet had no say in creating; for example, many perceived the stipulations of New York’s Neighbor Notification Act as fitting poorly with the on-the-ground reality they confronted in their daily work.

In their conception of the “Third Wave of Science Studies” (SEE), Collins & Evans (2002, p. 249) argue that, “rights based on expertise must be understood one way, while rights accruing to other ‘stakeholders,’ who do not have any special technical expertise, must be understood another way.” The authors go on to define “interactional expertise” as having sufficient expertise to “interact interestingly with participants”; this concept is distinguished from “contributory expertise:” having “enough expertise to contribute to the science of the field being analyzed” (Collins & Evans, 2002, p. 254). Though lacking formal degrees in science, Wynne’s Cumbrian sheep farmers, according to Collins & Evans, clearly had *contributory expertise* (i.e., knowledge about the physical environment and sheep farming) but lacked *interactional expertise* (i.e., the ability to establish their presence among the British scientists and authorities). Despite their credentials, applicators, in some cases, potentially fall victim to this same end: clearly knowledgeable about the subject at hand, yet unable—or perhaps even unwilling—to interact with “authorities” like

policymakers or regulators. Would other ARCs engaged in potentially “controversial” or “risky” science (e.g., the “safety” of hypodermic tattooing needles or lead-based paint) find themselves similarly silenced—either unwillingly, or by choice?

To remedy this situation, Collins & Evans (2002, p. 262) propose that such “disenfranchised” groups—whether pesticide applicators, Cumbrian sheep farmers, or commercial painters— “look for spokespersons with interactional expertise in the science in question.” The authors also suggest that “intermediary groups” such as NGOs might come to “speak for the scientific knowledge of the uncertified, not as campaigners, nor as experts themselves, but as translators” (Collins & Evans, 2002, p. 262). By enacting these suggestions, applicators—or ARCs more generally—could be afforded the voice that they are (arguably) due in public issues related to the science of their professions.

With or without a “translator” to speak for them, when formally recognized in their capacity as “risk communicators,” are ARCs thus *obliged* to share the information they do have? To answer such a question would seem to imply a normative judgment about the nature of democratic citizenship, an area of inquiry beyond the scope of this thesis; however, this concept remains critical in directing both theoretical and practical applications of this research. In sum, the following questions encompass the main thrusts of future research:

- What do we gain by recognizing ARCs as some form of “experts” as opposed to service workers, blue-collar laborers, etc.?
- Can/should ARCs be granted special roles in public and/or private decision-making forums, such as in regard to risk regulation? If so, how? Or, alternatively, can/should “translators” (in Collins & Evans’ sense) be used to advocate for these groups in decision-making forums?

- Do ARCs have a “democratic obligation” to share risk-based information with the public? Or, how does being an ARC relate to fulfilling the “project” of democratic citizenship?

Practical implications

Though exploratory in nature, the findings presented in this thesis nonetheless suggest several areas of possible change in both private sector and government practice. Perhaps a central, overriding implication arises out of a question: are successful ARCs “born” or “made”? While training featured prominently in the experience of certified pesticide applicators, the degree to which certain “skills” or “traits” can be taught—such as being a “people person” or having “common sense”—remains unclear. As mentioned previously in this chapter, the “emotion work” performed by many ARCs, such as pesticide applicators, may also imply a requisite level of “emotional intelligence”; again, it is not clearly evident whether or not this “intelligence” could, for example, be taught in a workshop, or even picked up secondhand in an apprenticeship.

In regard to this issue, I would be remiss in not mentioning the work of Fred Whitford, affiliate of the Purdue University Pesticide Programs, and author of *The Complete Book of Pesticide Management: Science, Regulation, Stewardship, and Communication*. His extensive practical guide includes a chapter focusing on risk communication with the public, in which the author weaves together gestures to the risk communication literature with matter-of-fact, practical advice; what results is a stitching-together of short sub-titled sections with platitude-like admonitions. Geared toward the practitioner, Whitford’s (2002) book attempts to translate what academics have learned into accessible, easy-to-enact steps. For instance, Whitford (2002, p. 729) begins his section on the “foundation of communication” by posing “five common

barriers” contributing to failed risk communication that, together, make up the “CAUSE” mnemonic:

- Lack of Confidence (i.e., communicator must gain the trust of the audience)
- Lack of Awareness (i.e., communicator must create awareness about the subject)
- Lack of Understanding (i.e., communicator must ensure that the information is presented at the audience’s level)
- Lack of Satisfaction (i.e., communicators must offer strategies or solutions “satisfactory” and “plausible” to the audience)
- Lack of Enactment (i.e., communicator must deliver the message so as to inspire changed behavior, or other action)

Developing the CAUSE mnemonic further, Whitford provides several pages on the “best ways” to connect with audiences when “making a presentation” (e.g., addressing all questions, avoiding “\$5 words,” “acknowledging feelings,” etc.); however, it is worth noting that engaging in an impromptu face-to-face conversation with a concerned citizen—as many applicators may—hardly merits the same advice as delivering a practiced speech to a community group. Even more importantly, while Whitford’s advice is targeted towards “the practitioner”—broadly speaking—it remains unclear whether this individual could (should) be understood as an applicator, a pesticide safety educator, an industry representative, or *some* or *all* of the above. While the idea motivating Whitford’s take on risk communication can serve as a critical starting point for training ARCs, clearly these “guidelines” can be further narrowed to better fit both particular job descriptions, and the dimensions of individual occupations.

Assuming, as Whitford may, that some of the traits and skills contributing to the hallmark of the applicator profession *can* be taught, two implications arise at the firm-based level:

Role-playing

Rather than relying on top down lecture, trainings could involve a larger spectrum of pedagogical techniques, such as participatory role-playing. For example, several pesticide safety educators described training sessions that employed a “hypothetical scenario” format, in which they engaged applicators in deciding on “appropriate” responses to typical face-to-face communication experiences with the public. Applying some permutation of Whitford’s (2002) CAUSE approach might be useful in guiding these exercises. Anecdotal evidence from both the interviews for this case study, and personal communication with pesticide safety educators suggests that these techniques are already in use in some states, yet usually for optional re-certification workshops, rather than mandatory certification trainings. Similar format and scenarios could be constructed, as appropriate, for other ARC occupations, possibly in a worker training setting.

“Framing” of the industry

As mentioned in Chapter Four, the way in which the public perceives the applicator, in addition to the way he perceives himself, may be related to an “official” institutional frame. When the indoor pest control industry refers to its applicators as “health professionals,” both in training sessions and in “official communication” (e.g., website, print materials), a strong message is sent to its workers about their role and their societal “worth.” For instance, the website of the National Pest Management Association (<http://www.pestworld.org>) features prominently several short flash videos relating controlling pests to safeguarding human health; one example involves an emergency room doctor relaying the health “costs” of various insect-borne

diseases. Other industries employing ARCs might also consider how their “official” literature frames the worker and how this, in turn, might influence the perceptions of both the workers themselves, and the publics they serve.

Other implications arise at the state or federal government level. For example:

Trainings

As was mentioned in the discussion of “Joe Homeowner” in Chapter Four, pesticide safety educators (those individuals most likely to train certified applicators) may have particular views and motivations that filter down to the applicator. It may be useful to identify these potential biases more deliberately. Moreover, state-mandated trainings at present are not required, by law, to cover risk communication issues; while changing legislation is never simple, one solution may be to have risk communication issues offered as a non-mandatory, but credit-offering, re-certification seminar.

Labeling

By law, applicators are required to share copies of the pesticide label or MSDS as necessary with the public; however, both of these documents are rife with technical language and scientific symbols possibly not accessible to the “average” homeowner or member of the public. While certain private firms produce their own “lay versions” of the labels and MSDS to hand out to clients, there exists no legal requirement to do so. Again, recognizing that laws are difficult to change, it is worth mentioning the work of Cooperative Extension in serving this “translator” function. Previous efforts in this area have been successful (e.g., Cornell University’s EXTTOXNET searchable Internet database of pesticide-related toxicology information), yet fraught with difficulties in securing adequate funding support to keep information readily updated and accessible to the public. Notably, in Fall 2006, Cornell’s Breast Cancer and Environmental Risk Factors group (BCERF) launched a searchable online database including accessible information on chemicals found in over 2800 turf and lawn-care

pesticide products (<http://envirocancer.cornell.edu/turf>). Given the recent launch date of its website, BCERF has not yet published claims as to its use or “effectiveness.”

Clearly, the issue of consumer labeling and reliable information outlets must continue to be addressed within state universities and federal funding agencies.

Concluding thoughts

“Knowing more about pesticides than your audience knows does not make you ‘the expert.’ Pesticides represent a complicated area of study, and even the most seasoned professionals in the field may not be experts... So know your stuff!” (Whitford, 2002, p. 740).

Whitford’s call to practitioners (writ-large) to avoid some of the “mistakes” that unskilled risk communicators may be prone to enact, provides a useful reflection on the preceding case. While pesticide applicators—and, by extension, other ARCs—may know “more” than their audiences, this “expertise” seems to draw multiply from trainings, on-the-job experiences, life events, and cultural identity. For applicators, and perhaps all ARCs, “knowing your stuff” may mean not just reciting back toxicological statistics and following safety protocols, but also “listening across difference” (Parker, 2003) and “managing” one’s emotions (Hochschild, 1983; Rafaeli & Sutton, 1987). “Knowing” about being a pesticide applicator, as this case study has shown, is as much mastering the correct mixing ratio of Roundup® as it is responding to a concerned neighbor, or promoting the image of a commercial industry. Recognizing and documenting this tension between multifaceted and even “invisible” job responsibilities and “expertise” holds considerable promise in contributing to both applied and theoretical risk communication.

APPENDIX A
HUMAN SUBJECTS APPROVAL INFORMATION
CONSENT FORM

Applying Pesticides in Public: Understanding the "Accidental Risk Communicator"

You are invited to participate in a research study of certified commercial pesticide applicators and the public. You were selected as a possible participant because of your current job and expertise in this field. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

Background Information: This project will examine how turf and lawn-care workers interact with their clients and the larger public over issues related to pesticide application. The goal is to increase understanding of the current role filled by these individuals in discussing risk issues with the public, and to consider the resources necessary to fill this role successfully.

Procedures: If you agree to be in this study, I will ask you participate in an interview, envisioned to last about 20-30 minutes, in which I will ask about your views on pesticides and how and what you communicate with the public about these views. With your permission, this interview may be audio-taped.

Risks and Benefits of Being in the Study: I do not anticipate any risks for you participating in this study, other than those encountered in day-to-day life. If we correspond via email, there is a chance that a third-party could read our correspondence. Indirect benefits of participation are greater awareness of the communication challenges faced by turf and lawn-care workers as well as their role in influencing public understanding of health and environmental risks.

Voluntary Nature of Participation: Your decision whether or not to participate will not affect your current or future relations with Cornell University. Your participation is voluntary, and you may refuse to participate before the interview begins, withdraw or ask questions at any time, and/or skip any questions with no effect.

Confidentiality: The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify you. All data will be securely stored in the investigator's office on the investigator's computer and several hard disks. Hard copies of data will remain in the investigator's office. All data will be destroyed (i.e., shredded or erased) when their use is no longer needed but not before a minimum of five years after data collection.

Permission to Use Recording Device: Please sign below if you are willing to have this interview audio-taped. You may still participate in this study if you are not willing to have the interview recorded.

Signature _____ Date _____

Contacts and Questions: The researcher conducting this study is:

Laura Rickard, Department of Communication, 336 Kennedy Hall, Cornell University, Ithaca, New York 14853. Phone: 607-255-4735; Fax: 607-254-1322; Email: lnr3@cornell.edu

If you have any questions or concerns regarding your rights as a subject in this study, you may contact the University Committee on Human Subjects (UCHS) at 607-255-5138, or access their website at <http://www.osp.cornell.edu/Compliance/UCHS/homepageUCHS.htm>.

You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information and have received answers to any questions I asked. I consent to participate in the study.

Signature _____ Date _____

This consent form will be kept by the researcher for at least three years beyond the end of the study and was approved by the UCHS on June 13, 2007.

APPENDIX B

INTERVIEW PROTOCOL

Introductory information

- 1) I'm interested to know what brought you to this point in your career. When you think back over the last 10 years or so, what were some of the defining events or experiences that influenced your professional life?
 - a. For example, were there any influential professors, places, or projects that you participated in that drew you into studying turf grass?
 - b. Besides training in horticulture and related sciences, are there other areas of knowledge or skill sets that you find particularly relevant or useful for your job?
- 2) How would you define what you are currently *most* interested in as a researcher?
 - a. Can you give me an example of a project that you're working on (or have worked on) that you're particularly proud of?
 - b. What are your teaching responsibilities at Cornell? How do you balance that with your research, and other professional societies or organizations you may participate in?
- 3) Either within your research, or in your personal life (or both) how would you characterize your experience with pesticides?
 - a. Probe to explain a particular incident, if applicable.
 - b. What are your lasting feelings about this (these) experience(s)?

Conceptions of risk/Types of risk

- 4) In your view, are there risks associated with using pesticides? If so, how do you define them?
 - a. Probe to explain whether he thinks there are different "types" or categories of risks and give examples of each, if applicable.
 - b. How would you rate each risk in relative "importance"? Again, probe for an example.
 - c. Are the risks different for different groups of people (e.g., for families applying pesticides at home vs. Cornell employees applying pesticides on the football field)?
- 5) If I were to pose the same question to the general public, do you think that most people would answer the way you did? Can you tell me why or why not?
 - a. What about professional pesticide applicators, like farmers or lawn care professionals?
 - b. What about Extension educators? Other Cornell professors?
 - c. How do you think each group would rate these risks in relative importance? (Try to probe for specific examples or instances.)
- 6) In your view, how do residents of Ithaca see these issues?
 - a. Is there a divide between different groups (for example, Cornell professors versus low-wage workers)?

- b. Do you think that this community is representative of the larger nation in terms of awareness and sensitivity to pesticide risks? (Probe for specific examples.)

Information Seeking and Risk Communication

- 7) In a most general sense, what should people know about pesticides?
 - a. Does a person's background or occupation influence what he or she should need to know about pesticides?
 - b. Probe to ask about differences between general public, turf professionals, Extension educators.
- 8) How should people receive this information? (e.g., public service announcements, written materials, commercials, government warnings, etc.?)
 - a. Can you describe a particular example (e.g., website, workshop, etc.) that you think explains risk information about pesticides particularly well? (Probe to get specific details, especially if it was a workshop or conference attended.)
 - b. Do different types of people (social class, occupation, etc.) require information in different formats?

Pesticides and Cancer

- 9) Some people are skeptical about claiming causation between pesticide use and cancer risk. How would you explain this skepticism?
 - a. (Regardless of your answer) How would you respond to this skepticism?
 - b. What are your feelings about the risk of cancer from pesticides?
 - c. How important is having information about cancer risk to potential pesticide users?
- 10) In terms of the issues we have discussed today, how do you understand the role of BCERF?
 - a. What kind of outreach tools would you predict to be most useful?
 - b. How do you see yourself best contributing to the project?

APPENDIX C

LETTER TO UNIVERSITY AND REGULATORY AFFILIATES

Dear «PREFIX» «LAST_NAME»:

I'm contacting you at the suggestion of your colleague, _____. As part of my MS thesis in Communication, I will be conducting in-depth interviews with certified turf and lawn-care pesticide applicators in upstate NY as well as with professionals in the pesticide and pesticide education fields. I'm interested in learning more about risk perceptions related to pesticides, especially in relation to health and environmental risks. One of my main interests is the way that turf/lawn workers may communicate risk-related information to their clients and to the general public, yet are not necessarily formally-trained to do so. Despite being the first (and in some cases, only) line of communication with some public audiences about pesticide-related information, many of these workers are either untrained or hesitant (or perhaps, both) to speak about these issues.

I'm sure your time is in short supply; however, if at all possible, I would like to invite you to participate in an interview, envisioned to last about 30 minutes. If you are willing to participate, perhaps the best option would be for you to suggest a feasible day or time as well as location that would be most convenient for you.

Your assistance in this project is greatly appreciated. Thank you again for your time and I look forward to hearing from you.

Sincerely,

Laura Rickard
Graduate Student, Department of Communication
lrr3@cornell.edu; (401) 258-7252

APPENDIX D

LETTER TO PESTICIDE APPLICATORS

[Insert Date]

«FIRST_NAME» «LAST_NAME»
«AGENCY»
«ADDRESS»
«CITY», «STATE» «ZIP»

Dear «PREFIX» «LAST_NAME»:

I am contacting you to ask for your help and expertise on a research project about turf and lawn-care workers and the public. This research is being sponsored by the Department of Communication at Cornell University.

Specifically, I would like to invite you to participate in an interview, envisioned to last about 20-30 minutes, about how turf and lawn-care workers interact with their clients and the larger public over issues related to pesticides. The goal is to increase understanding of the current role filled by these individuals in discussing risk issues with the public. Your responses will help us consider how to design more effective and efficient training materials and resources for certified pesticide applicators.

If you are able to participate, the best approach would be to conduct the interview in-person at the Empire State Green Industry Show in Rochester, NY from November 14-16, 2007. If we are not able to meet at the Industry Show, we could also conduct the interview over the phone, or even through e-mail if necessary.

For your convenience, I have enclosed an outline of the questions so you can have an idea of what I'll be asking you. I have also enclosed a copy of an informed consent form, which tells you about the study and your rights as a participant. Most importantly, please be assured that your answers to the questions will be kept *strictly confidential*. Any publications resulting from the interview will never include your name.

To follow up, I will try to contact you by telephone in the next couple of weeks. If you would like to contact me before then, please feel free to send me an email or give me a call. My contact information is below. If you are **not** able to participate, we would be grateful for references to any of your co-workers who you think might be interested.

Your assistance in this project is greatly appreciated. Thank you again for your time.

Sincerely,

Laura Rickard
Graduate Student, Department of Communication
lnr3@cornell.edu; (401) 258-7252

APPENDIX E

QUESTIONNAIRE AT THE EMPIRE STATE GREEN INDUSTRY SHOW

Please answer the following questions. If you need more space, feel free to attach extra sheets. Return completed forms to Laura Rickard by 5:30 PM on Wednesday, November 14th **OR** mail to:

Laura Rickard
Department of Communication, Cornell University
336 Kennedy Hall
Ithaca, NY 14850

Thank you!

1) Describe a person who would be successful at your job. What skills would he or she have? How about other characteristics, like personality traits?

2) In your view, do pesticides pose risks? If so, what are they?

3) Some scientists talk about a connection between pesticides and human health. What are your feelings about the possible link between pesticides and illness?

4) In your experience, what are some of the most common questions you receive from clients, or other members of the public, while on the job?

5) How do you see your role in addressing these questions with your clients and the public?

You're almost done! Just a few more questions...

1) Which of the following best describes your current certification status? (**Please check one.**)

_____ New York State Certified Commercial Technician

_____ New York State Certified Commercial Pesticide Applicator

_____ Apprentice

_____ Other (please

specify: _____

2) Which of the following best describes your primary place of employment? (**Please check one.**)

- ☐ Nationwide commercial landscape, lawn, garden, or tree care company
- ☐ Statewide or regional landscape, lawn, garden, or tree care company
- ☐ Local landscape, lawn, garden, or tree care company
- ☐ Public golf course
- ☐ Private golf course
- ☐ University or college grounds department
- ☐ Elementary or secondary school district
- ☐ Municipal or county parks and/or recreation department
- ☐ Cemetery
- ☐ Self-employed (please specify type of work: _____)
- ☐ Other (please specify: _____)

3) What is your current job title/position? _____

4) What is the highest level of school you have completed? (**Please check one**):

- ☐ Junior high or middle school
- ☐ High school graduate
- ☐ Trade/technical school after high school
- ☐ Some college
- ☐ 2- year college graduate
- ☐ 4-year college graduate
- ☐ Post-graduate work

5) I am: ☐ male ☐ female

6) My age is _____ years.

7) Do you have children (including grown children)? (**Please check one.**)

☐ Yes ☐ No

Thank you for your time! Please return this form either in person, or to the mailing address on the first page.

APPENDIX F
INFORMATION SOURCES USED BY RESPONDENTS

Source	Representative Quotation
Cooperative Extension	<p>"I don't go to Extension and I don't go to regulators because they know nothing...There's so many new products today and the technology is changing so rapidly... They just don't know anything [about] what's going on" (Manager, indoor pest control firm).</p> <p>"...[Extension does] have something called EXTOWNET [Extension database with toxicity information on pesticides]... If a business...had copies of those [information sheets], those are good communication devices" (Pesticide safety educator).</p>
Government	<p>"...If [a customer] really, really were concerned about...a product that I wasn't applying and I didn't know anything about the product, the best thing to do is tell them to get a hold of...New York State DEC" (Owner, local landscaping firm).</p>
NGO	<p>"...It's called the PAN [Pesticide Action Network] database.... They... condense all this toxicology research and...simplify it into kind of categories of specifically whether a material is carcinogenic...immunogenic or...an endocrine inhibitor... It's...just a general way of looking at a pesticide and whether they call it a bad actor..." (Applicator, university natural lands).</p>
Internet/print media	<p>"...I wouldn't hold anything back from anybody, so [my employees are] welcomed to have all the information they can. And we have all kinds of books here. The Internet now, of course. They can research things. They have their own computer out back here" (Owner, local lawn care firm).</p> <p>"...More and more of our technicians today [are] computer savvy and Internet savvy and...if you go to the correct places, there's very good and accurate information out there" (Manager, regional indoor pest control firm).</p>

APPENDIX G

TRAITS OF “JOE HOMEOWNER”

Trait	Representative Quotation
Ignores written safety warnings (e.g., posted signs)	“...Everything we spray has to be posted, but people never read the signs. So they ask you the information, and...there might be sign five feet away” (University grounds person).
Has responsibility to inform himself	“... I think the public...and the applicator both have to be educated...you can’t just put all the emphasis on the applicator to know everything...If you’re not sure about what’s going on in your lawn, you should somewhat try to educate yourself ” (Owner, local landscaping firm).
Can purchase pesticides easily, and without any regulation	“...As a landscaper, if I apply Roundup® on a property, I have to fill out an hour’s worth of paperwork. A homeowner can go to Home Depot, buy the same exact stuff that I can buy and spray it however they want” (University orchard worker/former landscaper).
Ignorant of the additives in commonly-purchased pesticides	“...I was...at a friend’s house and sitting on her porch and there was a bottle of Roundup® sitting there on the ledge...actually the Roundup®...that she bought is not just glyphosate, it’s actually diquat also...This homeowner has no idea...[what] even the difference between diquat and glyphosate would be... (Manager, university natural lands area).

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