

THE ENVIRONMENTAL HEALTH PARADOX:
HOW COMBINING PUBLIC HEALTH WITH ENVIRONMENTAL PROTECTION
MAY TIP THE BALANCE IN FAVOR OF PUBLIC HEALTH PROGRAMMING

A Thesis
presented to
the Faculty of the Graduate School
at the University of Missouri-Columbia

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
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MAY 2013

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

THE ENVIRONMENTAL HEALTH PARADOX:
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PROGRAMMING

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ACKNOWLEDGEMENTS

First and foremost, I would like to thank the members of my committee for their patience, advice, and support during the writing of this thesis: Dr. Lael Keiser, Dr. David Webber, and Dr. Mary Stegmaier. Without my committee, none of this would have been possible. I would also like to thank my family and friends, especially my mother, father, and Clint Swift for their love and support. Finally, I would like to thank the Political Science Department at the University of Missouri for their attentiveness to my aspirations and their belief in my scholarship. To all of these and more, I am grateful beyond words.

TABLE OF CONTENTS

Acknowledgements	ii
List of Illustrations	iv
1. Organizational Structure and Goal Ambiguity	4
2. Why Prioritize Public Health?	9
3. Data and Methods	11
-Units of Analysis and Coding Definitions and Procedures	16
-Inter-Coder Reliability	18
4. Results	19
5. Future Questions and Closing Remarks	21
Appendix A: Combined Environmental/Public Health State Agency Codebook	29
References	32

LIST OF ILLUSTRATIONS

• Table 1: Structural Types Across the States	27
• Table 2: Proportions of Text Topics	27
• Table 3: Marascuilo Contrasts	28
• Figure 1: Environmental Regulation, Public Health, and Environmental Health	29
• Figure 2: State of Hawaii Department of Health Organizational Chart	30
• Figure 3: Theoretical Flow Chart	31

Before 1970, state governments controlled the majority of environmental and natural resources issues; however, towards the end of the 1960s, there was growing concern that state governments were not adequately dealing with environmental health threats (Davies, 1970; Lowry 1992). As a result, the federal government established the Environmental Protection Agency (EPA) and passed four large pieces of environmental legislation in the early to mid-1970s: the Clean Air Act, the Clean Water Act, the Endangered Species Act, and the Resource Conservation and Recovery Act. Although the legislation was formed at the federal level, the states have implemented the majority of this legislation, themselves, as they are required to meet federal standards by setting up state implementation plans. By one estimate, the states operate approximately 96% of federal programs “that are delegable to them,” spending approximately \$12.7 billion annually on environmental protection (Konisky and Woods, 2012; Environmental Council of States, 2010).

With each state maintaining its own environmental protection programming via state-level environmental protection agencies, each state chooses to meet federal standards in its own way. Some states choose to let the EPA control the majority of regulatory compliance inspections; others leave inspections up to local offices. Some states choose only to meet regulatory standards as set by the federal government; others choose to go beyond federal standards, enacting individualized state environmental policy. Another way states differ in their approach to maintaining environmental quality is in structural organization. This is the focus of my study.

Each of the 50 states has at least one bureaucratic agency dedicated to environmental protection. However, many of those agencies perform functions that are only tangentially related to environmental *protection*, as defined by the goals and mission of the EPA. For example, 31

states have chosen to adopt single-function structures, meaning their agency only focuses on environmental protection—as defined by the goals of the EPA; whereas, nineteen states have chosen some type of multi-function structure, in which they combine environmental protection with health, natural resources, and/or energy. Table 1 shows the distribution of various structural types across the 50 states. For the purpose of this study, we will be looking primarily at the multi-function structure that combines public health and environmental protection.

States have a variety of reasons for reorganizing and combining agencies. Typical executive reorganization involves the consolidation of the responsibilities of separate agencies into a smaller number, in order to reduce “wasteful duplication and coordinate the delivery of services” (Ferguson, 2013). Reorganization has often been considered a useful tactic for controlling the bureaucracy (Rosenthal, 1990; Beyle, 1995; Elling, 2004; and Gormley, 2006, as cited in Ferguson, 2013). In the specific case of the consolidation of environmental protection agencies, some states may have combined programs because environmental programming used to be handled primarily within state health agencies and state natural resource conservation boards. The separation of environmental protection from its historically associated agencies/boards occurred primarily during the 1970’s, a time when a new emphasis on regulation was introduced into environmental issues (Kotchain, 1997). Although the majority of states separated environmental protection from public health, some states have continuously justified the choice to keep their environmental protection combined with other types of programming. Since the Kansas State Board of Health was created in 1885, the issue of combining or separating public health and environmental programming came up on five separate occasions (Shepherd, et al., 1999). This example of continuous debate reflects the uncertainty about the appropriate place of environmental protection programming; there are a variety of competing

rationales for both combining public health and environmental protection and for keeping the two separate.

According to the Annual Review of Public Health, research on the combination of public health and environmental protection in public health agencies suggests that the combination of competing programs may lead to employee confusion over what role they play. Those bureaucrats working in environmental health may not be qualified to assist in compliance evaluations or other environmental protection tasks (Gordon, 1998). Kotchain (1997) suggests that separating agencies into single-function institutions makes oversight of these agencies easier (Sinclair and Whitford, 2013). However, Sinclair and Whitford (2013) describe the environmental health community's distress at the idea of separate public health and environmental agencies. The health community argues that separating things like environmental protection and public health will lead to environmental protection agencies forgetting their role in preserving public health and vice versa (Sinclair and Whitford, 2013 and Black, 2000). While many studies (Shepherd, et al., 1999 and Black, 2000) describe the underlying connections between the public's health and the protection of the environment, there is little understanding about the impact of combining two programs that are often separate at the federal level and in most other states.

Although the broad relationship between structure and agency behavior has been studied in-depth by public administration scholars (Landau, 1969; Wilson, 1989; Seidman, 1997; Frederickson, et al., 2012; Meyer, 1968; Jaques, 1990; Heimann, 1993; Carpenter, 1996; Frederickson & LaPorte, 2002; Hammond, 1986), no study has established how variations in environmental agency structure may lead to the prioritization of some programming over other programming. The literature that does exist about environmental agency structure (primarily

Whitford and Sinclair, 2013) poses the question, “why are agencies structured the way that they are,” instead of “what are the consequences of those structural choices?” This study looks at the consequences of a specific choice, combining public health with environmental protection, while posing the following question: how does a combined public health and environmental protection agency divide their focus between the goals of public health and environmental protection?

Using state-level environmental protection annual reports, I determine whether or not combined agencies, serving multiple functions, show significant preference to one function over another. I begin the study by providing a brief review of how organizational structure can impact the way agencies prioritize goals and why states may choose to prioritize some goals over others, followed by a content analysis. Studying a combined structure, in-depth, can aid us in determining how structure impacts the dispersion of resources and programming and if this dispersion negatively impacts one program or the other.

1. Organizational Structure & Goal Ambiguity

In *Bureaucracy*, James Q. Wilson explains the difficulties that exist in evaluating agency performance. One measure of success is whether or not agencies are able to carry out the government actions that have been bestowed upon them by primary policymakers (Wilson, 1989). Bureaucrats working day-to-day operations may have differing views of bureaucratic priorities than political appointees at the top of the agency hierarchy. Once a decision is made, others receive the task of implementing that decision, and the way in which those implementers choose to carry out their task(s) is shaped by their own interests and the operating procedures and constraints that exist within the structure that the implementer functions (Allison, 1971; Allison & Halperin, 1972; Rosati, 1981). This bottom-up view of bureaucracy supports the idea that

structural variation could lead to a variation of priorities across the states. Therefore, the way roles and responsibilities are distributed can impact whether or not policy goals from the top reach the hands of implementers—“rank-and-file” bureaucrats. This distribution is the result of structural choice.

An institution’s structure and the way it distributes power provide important insights into how a bureaucracy’s delegation of authority, the programs and policies placed within its jurisdiction, and its relationship to other institutions combine to determine the political influence of bureaucratic actors (Landau, 1969; Wilson, 1989; Seidman, 1997; Frederickson, et al., 2012; Meyer, 1968; Jaques, 1990; Heimann, 1993; Carpenter, 1996; Frederickson & LaPorte, 2002; Hammond, 1986). Structural elements determine who sets agency goals, who pursues them, and how/if goals are reached. Therefore, examining structural variations can help us to understand why institutions allocate resources to specific programs and policies. Frederickson, et al. (2012) suggest that some critics argue problems like inefficiency and unresponsiveness can be fixed by organizing agencies by functional responsibility, putting them into a strict, single-function, hierarchical structure that clearly assigns responsibilities and authority. If specific structural characteristics, such as multi-function hierarchies, are found to be detrimental to agency performance, the alteration of existing bureaucratic structures may lead to better agency efficiency and responsiveness. Hierarchical structure is a standard attribute of bureaucratic agencies (Meyer, 1968; Wilson, 1989). However, variations of the standard hierarchical structure occur across agencies. If the structure of bureaucratic agencies has an impact on how bureaucrats view their roles and responsibilities, structure will also dictate much of the agency’s day-to-day operations (Wilson, 1989). Therefore, it must bear some influence on bureaucratic ability to implement policy.

Although hierarchical structures with strict role assignment are assumed to promote efficiency, it is possible that other structural layouts may lead to better agency performance. From an administrative perspective, jumbled lines of authority and redundancy may not be entirely detrimental (Heimann, 1993; Seidman, 1997; Landau, 1969; Bendor and Moe, 1985). In some cases, duplications and ambiguity of authoritative powers lead to more reliable systems—agencies that are able to avoid making systematic errors (Heimann, 1993). If, as the literature suggests, some organizational structures are better than others, we must understand how structure directly impacts agency behavior, affecting the roles, responsibilities, and goals and missions of an agency and those that work within it if we are to determine what organizational structures lead to more consistent outcomes.

Scholars have determined that some public agencies have ambiguous goals, making it easier for agencies to justify the programming they pursue and making it much more difficult to measure their success (Chun and Rainey, 2005; Lee, et al., 2009, 2010). If policy goals are unclear or constantly fluctuating, bureaucrats may lose sight of some goals, as they pursue others (Whitford, 2005). When agency goals are vague, the priorities of the agency become vague, as well, giving an opportunity to agencies to favor certain goals over others, even in situations where the agency mission is supposedly split equally between two purposes (e.g., environmental protection, health).

One of the most recent studies on goal ambiguity considers the detrimental effect that multiple functions (via multiple hierarchies) within a single agency—usually one with a regulatory purpose and one with a non-regulatory purpose—have on task implementation and error avoidance (Carrigan, 2012). Using data from the Program Assessment Rating Tool (PART), the study determines whether or not goal ambiguity, the result of combining structures,

leads to disasters, such as the BP Gulf of Mexico spill. While admittedly the PART scores have biases, the use of this data allowed the researcher to further claims that goal ambiguity leads to agency errors and failures. The existence of multiple functions appeared to create confusion over roles and responsibilities, leading to agency error.¹ Carrigan's (2012) research is of importance because it directly specifies the impact organizational structure, specifically structures combining multiple foci, has on creating goal ambiguity and the effects that goal ambiguity may have on agency behavior. An organization's structure determines who makes decisions and who implements those decisions. The implementation of programming may differ, according to bureaucratic perception of the agency's goals.

Chun and Rainey (2005) discuss the effects that four dimensions of goal ambiguity—mission comprehension ambiguity, directive goal ambiguity, evaluative goal ambiguity, and priority goal ambiguity—have on organizational effectiveness. For the purpose of this study, mission comprehension ambiguity and priority goal ambiguity are most important. *Mission comprehension ambiguity* is defined as the breadth of interpretation that can be applied to an organization's statements of mission and purpose (Chun & Rainey, 2005; Daft, 1998; Dess and Miller, 1993; Thompson, 1997). Organizations provide an assortment of materials that relay messages about the organization's mission, such as mission statements, annual reports, and strategic implementation plans. These materials are what the organization uses to define itself to the public, and the material provides specific expressions of organizational purpose, so the organization's success may be evaluated by their success in implementing programs and decisions that relate directly to an organization's mission. Combined public health and environmental protection agencies describe themselves as serving both the functions of

¹ It should be noted that there is existing literature on multiple hierarchies that claims to show that the ambiguity and

preserving public health and protecting the environment; however, there is no indication of what proportion of agency resources will be distributed to either function. Therefore, the breadth of mission allows for the agencies to prioritize some goals over others.

Priority goal ambiguity is defined as the amount of discretion organizations possess when determining which goal(s) to pursue out of the multiple goals the organization is intended to function towards. This type of goal ambiguity exists within agencies that combine functions, with multiple hierarchies under one, overseeing director. For example, if state health agencies are combined with state environmental agencies, decisions must be made about how to disburse funding, staff, and programming efforts between two functions. Since, as mentioned previously, the statements of mission for combined agencies do not specify a primary goal, combined agencies are able to prioritize some goals over others. More simply, the breadth of an agency's statement of purpose makes their primary goal(s) more difficult to identify. When multiple functions are taken on by an agency, this identification becomes even more complicated. With broad statements of purpose, covering multiple functions, agencies are able to choose how they prioritize functions and goals.

In prioritizing goals of environmental protection, there are a variety of goals within environmental protection that do not directly involve human health—discussed in more depth later—meaning that combined state agencies must find a way to carry out the services expected of them by both federal principals and state constituents of both environmental protection and public health programs. Certain environmental and health programs are mandated by federal law, as implemented by federal agencies. At the federal level, the EPA is a single entity, and its goals are prioritized by that single entity's interests. When states combine environmental agencies with health agencies, energy agencies, or natural resource agencies, the prioritizing of goals is

complicated by a multi-layered prioritization process, as each separate entity attempts to press its own, agency-specific goals. That being said, certain factors, such as the historical evolution of agencies, state ideology, and the assessed need for agency services should allow us to make predictions about how state agencies may prioritize competing functions like public health and environmental protection.

2. Why Prioritize Public Health?

Up until the early 1970's, environmental health was primarily considered a function of public health agencies. Conservationist ideologies supported the protection of public land, but programs that we presently understand as environmental protection, such as clean water and toxic waste disposal, were under the jurisdiction of public health, as they related to illness. However, by the 1970's, a variety of "industrially related public health outbreaks" had raised awareness and concern about protection from environmental exposure, which led to public demand for industrial regulation (Kotchain, 249). The EPA was created, and a substantial amount of federal environmental law was passed. The new emphasis of environmental legislation was compliance and regulation of industry. This was the time period when many state health programs separated environmental protection programming from public health programming (Kotchain, 1997). However, as I have pointed out, some agencies maintained the combined structure.

Recently, Whitford and Sinclair (2013), have determined a variety of reasons why states may have chosen to adopt the combined public health/environmental protection structure. Whitford and Sinclair argue that state ideology and the assessed need for environmental protection may have contributed to states' decisions to separate or combine public health and

environmental protection programming. They find that more conservative states, those less likely to be environmentally focused, are more likely to choose the combined structure. This makes sense because the reason for the 1970's separation of public health/environmental protection programming was a new emphasis on compliance and regulation of industry. More conservative states would be less amenable to higher amounts of regulation; therefore, they would be more likely to keep the combined structure that is not as regulation-driven.

The importance of the historical evolution of these agencies resides in the historical lack of emphasis that was placed on environmental health within state health programs. For example, in 1974, it was estimated that health functions "comprised 72% of the combined health and environment budget" in Kansas (Shepherd, et al., 1999). In addition, environmental health only comprises about 3 to 4 percent of total state spending on health (Whitford and Sinclair, 2013). Therefore, these combined agencies were designed to focus on public health functions, even after environmental protection departments were formally integrated.

In addition to Whitford and Sinclair's findings, Stazyk and Goerdel (2011) find that varying levels of political support have an impact on the way agencies view their goals. This finding is of interest for the following reason: if varying levels of political support have an impact on the way agencies prioritize functions, it suggests that a political atmosphere, including state ideology and public opinion will have an impact on the way agencies distribute resources across functions. Pursuing environmental functions may be more politically feasible in states with more liberal ideologies; whereas, public health functions may be more politically feasible in states with more conservative ideologies. Therefore, if we assume that more conservative states are more likely to keep combined structures that historically focus less on environmental protection, we might expect that trend to continue, especially when environmental protection is

at odds with state ideology, making the pursuit of environmental protection programming less politically feasible.

Whenever more than one chain of power works within a single agency—under one primary budget, one director (see Figure 2)—goals become less easy to identify. As mentioned previously, studies of organizational structure, mentioned above, *do* focus on the consequences of various structures; however, only Carrigan (2012) suggests that goal conflict may lead to consequential behavior. As suggested by Chun and Rainey (2005), broad missions and multiple functions make it easier for agencies to justify the prioritization of some goals over others. If we assume that one goal is a more politically feasible goal, we might assume that political actors may be more likely to prioritize that goal (Stazyk and Goerdel, 2011). Therefore, a combination of public health and environmental protection—separate hierarchies within one agency—should create goal ambiguity, allowing political actors to prioritize more politically feasible goals. In the case of combined agencies, the more politically feasible goal is public health, since the combined agency structure is typically adopted by more conservative states (Whitford and Sinclair, 2013). Therefore, we should expect to see combined agencies focus on public health, at the detriment of environmental protection (see Figure 3 for a visual representation of this linkage).

Hypothesis: Agencies that combine public health and environmental protection functions will devote significantly more time and resources to public health than environmental protection.

3. Data and Methods

In order to test the above hypothesis, I perform a content analysis on 2011 annual reports for state environmental agencies that combine environmental protection and public health

functions: Colorado, Hawaii, Kansas, South Carolina, and North Dakota. Understanding the difference between primary and peripheral missions, goals, programs, and services helps to define agencies' behaviors, and understanding agencies' behaviors allows for better understanding of government expectations and the resulting state and local conditions. In addition, evaluation of government agencies can only be accurate if the understanding of the agency's primary mission is accurate. By analyzing descriptive agency materials—specifically annual reports and strategic plans—I will be able to determine whether or not an agency places emphasis on particular goals over another, further aiding in the understanding of agency behavior and future evaluation efforts.

Therefore, as described by Krippendorff (2004), I perform a content analysis of descriptive agency materials to identify trends and patterns in the emphasis state agencies place on either environmental protection or public health. I have chosen specifically to sample agencies that combine public health and environmental protection, as they are multiple-function agencies, with mild goal conflict. In other words, their responsibilities often overlap (as can be seen in Figure 1). This analysis should allow an opportunity to see if multiple-function agencies significantly prioritize one focus-area over another, addressing *H1*.

Throughout the content analysis, I focus on how often language regarding environmental protection and/or public health appears in the material and if or when any language is co-occurring. These proportional figures are reported to answer the three research questions listed below:

(1) What percentage of the state agency descriptive text, including mission statements, strategic plans, and/or annual reports specifically mentions or indicates environmental protection topics

and/or efforts?

(2) What percentage of the state agency descriptive text, including mission statements, strategic plans, and/or annual reports specifically mentions or indicates public health topics and/or efforts?

(3) What percentage of the state agency descriptive text, including mission statements, strategic plans, and/or annual reports can be identified as both environmental protection and public health topics and/or efforts?

Simple proportional figures should provide answers to the first research questions; however, in order to determine whether agency efforts significantly differ in regards to environmental protection versus public health, I must evaluate the text, based on an assumed standard that agency efforts should be split 50/50 between the two programs. Using this standard assists me in determining whether or not one program receives more emphasis than another, answering the final question, below:

(4) Does the state agency descriptive text, including mission statements, strategic plans, and/or annual reports, reveal inequalities in agency focus?

The results of this content analysis help to make inferences about institutional processes within agencies with combined hierarchical structures and broader inferences about organizational structure and goal ambiguity as behavioral and output determinants.

There are five state agencies that are considered to be responsible for both public health and environmental protection. Agencies provide descriptive materials, not only to inform the general public, but to attempt to define primary missions for agency workers (Wilson 1989). For this study, descriptive materials are defined as annual reports, strategic plans, or any other descriptive materials of similar disposition. The easiest way to access these descriptive materials is to view the state agency websites. Each state agency maintains and updates websites that provide informative and descriptive material as to the agency's role in state and local government. More specifically, how the agency wishes to define itself to the public is contained within much of this descriptive material. In order to gauge balance among agency efforts, a content analysis will be performed on the descriptive material that the agency uses to define itself to the public via their public state agency websites. Therefore, the sampling units are the state agency websites, themselves, where I pulled specific, descriptive materials relevant to the research questions listed above.

As this content analysis is part of a larger statistical study on organizational structure within state bureaucratic agencies, the scope of the analysis is narrow, limiting and specifying the population. Only five states share the unique structure of interest; therefore, the population is made up of only the five state agency websites, where descriptive materials relevant to the study's research questions will be pulled for analysis. For this particular analysis, the sampling frame and the population are identical, as I have very narrowly defined the population to these combined agencies. Rather than comparing across environmental agencies with single functions to those with multiple functions, I simply examine how important environmental protection is in multi-functional agencies.

Once again, due to the limited scope of the study, the sampling methods needed to answer the research questions, are non-probabilistic and intentional. The coding units relevant to the study are the descriptive materials, including annual reports and strategic plans. The specificity of the material needed to answer the research questions makes probabilistic sampling methods less appropriate for the analysis. The intentional sampling of descriptive materials only relevant to the research questions at hand is defined as relevant (or purposive) sampling by Krippendorff (2004). Krippendorff describes the results of the relevance sampling method stating, “the resulting units of text are not meant to be representative of a population of texts; rather, they are the population of relevant texts, excluding the textual units that do not possess relevant information” (119). In addition to using the relevant sampling method, as described by Krippendorff, this content analysis may also be considered a census, as the collection of texts is presumed to include “all of its kind” (120). It is possible that other descriptive material may exist outside the population of interest, but for the specific purposes of this study, the population has been defined as only the state agency websites, where all defined, descriptive texts may be analyzed.

It is not uncommon to question the legitimacy of a statistical analysis if the sample size is suspected of being an inadequate representation of the population. However, for this particular content analysis, sample size is mostly irrelevant, as the materials being analyzed are the only materials of interest. Performing a census requires the analyst to assume that he/she is describing reality, as the entire population is available for analysis. Therefore, there should be no measurement errors to be weary of, making the quest for an adequate sample size irrelevant.

Units of Analysis and Coding Definitions and Procedures

For each of my research questions, the population consists of the five state agency websites, containing all of the online material the agencies wish to present to the public. In order to answer the questions, I have purposively sampled from this population what I have defined as descriptive text.² Because the amount of text is limited, coders coded each block of descriptive text³ to determine whether it is categorized as primarily an environmental protection topic, a public health topic, a combined topic, or other⁴. The material was coded using the following operational definitions⁵:

Main Topic

Each sentence will be coded by its main topic. For the purpose of this study, the main topic is defined as the block of texts' main focus. More specifically, the topic of a block of text should be determined by the mention of public health or environmental protection effort(s) and/or concepts, as defined below. If both types of efforts and/or concepts are mentioned, the effort or concept mentioned most frequently in the block of text should be considered the main topic. If both types of efforts or concepts are mentioned in the same frequency, the block of text should

² Descriptive text: Annual reports or strategic plans

³ A "block of text" is defined as any substantial break in text, including indented paragraphs, white space between blocks of text, and the start of a bulleted list. These were not difficult to identify within the content being used, as each agency's reports/plans contained blocks of text fitting this definition. In the future, it may be necessary to calculate inter-coder reliability for unitization; however, I deemed it unnecessary at this time because of the format of the texts being analyzed.

⁴ Coded 1-4 (1= Environmental Protection, 2= Public Health, 3= Combined, 4= Other)

⁵ More information on operational definitions and coding procedures is available by viewing the study's codebook, available via request to the author.

be coded as being a combined effort. There is also an option for blocks of text that contain no references to environmental protection or public health.

Environmental Protection Efforts & Concepts

Environmental protection efforts and concepts are defined as any mention of efforts or concepts strictly dealing with the protection of the environment. These mentions could include descriptions of site cleanup efforts, drinking water quality standards and/or regulations, waste water, air quality standards and/or regulations, clean environment goals, hazardous waste, pollution, recycling, climate change, environmental quality, and a variety of other environmentally focused efforts and concepts not mentioned here. Environmental protection efforts/concepts should not include combined health/environmental efforts or concepts, including disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.).

Public Health Efforts & Concepts:

Public health efforts and concepts are defined as any mention of efforts strictly dealing with the physical or mental health of the state population. These mentions could include descriptions of vaccination distribution, food sanitation efforts, specific disease control efforts (e.g., H1N1 flu, sexually transmitted diseases), nutrition services, mental health care, public health, and a variety of other health-focused efforts or concepts not mentioned here. Public health efforts and concepts should not include combined health/environmental efforts/concepts, including environmentally caused disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.).

Combined Efforts & Concepts:

Combined environmental protection and public health efforts and concepts are defined as any mention of efforts or concepts dealing with both the protection of the environment and the physical health of the state population. These mentions could include descriptions of environmentally caused disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.), health inequalities due to environmental justice issues, or various other efforts/concepts that state a combined effort not mentioned here.

Inter-Coder Reliability

In order to calculate inter-coder reliability I, the primary researcher, and one other coder, Megan Schoor⁶, independently double-coded approximately 10% of the final content analysis sample. A separate reliability sample was not used, as the entire population of documents relevant to the research questions is being used for the content analysis. To prepare for double-coding, Schoor and I trained together for a first session of approximately an hour and a half. Originally, the sample was unitized by sentence, with the entire sample comprised of over 1,000 sentences. Schoor was asked to double-code around 150 sentences. After performing a statistical analysis to determine inter-coder reliability via the ReCal2 website, it was determined that the codebook should be altered to obtain a higher score.⁷ Schoor's and my meeting to determine this alteration took about an hour and forty-five minutes. I decided to consolidate the sentences into blocks of text, as the differences that were occurring between me and the coder were misunderstandings over phrases that focused on administrative matters—latently connected to

⁶ Schoor is a public administration graduate student, familiar with studies of organizational structure and bureaucratic literature.

⁷ The original score was a Krippendorff's *alpha* of about .63, less than marginally acceptable.

either public health or environmental health issues, but not explicitly so. By blocking the text, sentences were able to be better suited to context. This new unitization consisted of a final content analysis sample of about 657 blocks of text, with Schoor and I, independently, double-coding 68 blocks.⁸

In order to compute inter-coder reliability, I input Schoor's and my responses into two columns, categories 1-4, into an Excel file. The Excel file was saved as a CSV file and uploaded into the ReCal2 website, where multiple measures of inter-coder reliability were calculated. For the purpose of this study, I chose to use Krippendorff's *alpha* as my measure for reliability, as it is well-suited to small sample sizes. Krippendorff's *alpha* calculates the amount of agreement between coders, while controlling for agreement by chance. The final Krippendorff's *alpha* for this content analysis is 0.681, with 82.4% agreement between the coders. Although this number is an improvement over the original score, conclusions of this study should be classified as tentative.⁹

4. Results

After coding 657 blocks of text from five combined state agency websites, I was able to obtain figures and perform statistical analyses to answer the research questions posed above. The

⁸ In the updated version of the codebook, a "block of text" is defined as any substantial break in text, including indented paragraphs, white space between blocks of text, and the start of a bulleted list. These were not difficult to identify within the content being used, as each agency's reports/plans contained blocks of text fitting this definition. In the future, it may be necessary to calculate inter-coder reliability for unitization; however, I deemed it unnecessary at this time because of the format of the texts being analyzed.

⁹ It is possible that the reliability sample did not contain enough categorical variability, as the sample being used, comprised mostly of Hawaii's strategic plan, was almost entirely focused on public health issues. In addition, public health and environmental topics can be easily confused, as agencies frequently use phrases such as "environmental health" or "health environment." In the future, categories may need to be more strictly defined, and a more varied reliability sample should be used in order to raise the *alpha* reliability score closer to the acceptable score of around .80.

first three research questions deal with the proportions of public health, environmental protection, and combined topics/efforts that exist within the literature analyzed. Table 1 portrays the proportions provided by frequency tests performed on the data.

Approximately 60% of the descriptive agency material (by block of text) was coded as being public health related. This appears to drastically outweigh the other categories, including environmental protection at 19%, combined topics at 10%, and other topics at 11%. Although the reports and plans analyzed all contained environmental protection topics, public health topics were much more prevalent, with non-environmental disease control, health information, and age-specific care comprising the main foci. Environmental protection efforts were primarily confined to simple air, water, and waste regulation, occasionally referencing public health as a reason for regulating environmental factors.

There is no question that public health topics/efforts outnumbered both combined and environmental protection efforts; however, in order to determine if true inequality exists among topic-areas, I used a chi-square goodness-of-fit analysis.¹⁰ The chi-square test indicated that there were significant inequalities among topic-areas [$\chi^2(3, N=657)=428.22, p<.001$]. Because chi-square tests do not specify where the actual inequality exists, I performed Marascuilo Contrasts to determine specific inequalities between categories. The results can be seen in Table 2.

According to the Marascuilo Contrasts, statistically significant (at $p<.05$) differences occur between the public health category and all other categories, meaning public health efforts have a significantly unequal presence when compared to environmental protection efforts, combined efforts, and other efforts. According to the agencies' descriptive materials, the focus of the agencies is unequally devoted to public health. Although the chi-square and Marascuilo

¹⁰ Fisher's Exact was not used for this analysis, as all cell counts were >10 .

Contrasts were performed with the expected frequencies of categories= .25 each, the simple frequencies reported earlier confirm that public health is the priority of the analyzed agencies, that is if their descriptive materials truly define them as agencies

As suggested by the previous organizational literature, the results of this content analysis reveal ambiguities in agency focus. When a bureaucratic agency has jumbled lines of authority, including disruptions in a standard hierarchical structure as exists in the combined public health and environmental protection model, it is likely that the agency will be able to prioritize a more politically feasible goal. In this case, that goal appears to be public health. This would suggest that environmental protection may not be receiving the same amount of effort as public health, even though the combined agencies are intended to serve the goals and tasks of both independent programs.

Ultimately, this short content analysis provides us with indication that one of the multiple-function types, health/environmental protection, prioritizes goals in a way that leads one piece of the hierarchy—health, more specifically—with a higher amount of agency focus and resource devotion. Although this analysis does not test each type of structure for goal inequities, the multiple-function structure tested here is one with one of the lowest levels of goal conflict, meaning that discrepancies may be even more apparent in structures that combine programming that is less complementary.

5. Future Questions and Closing Remarks

The intent of this study was to describe how structural elements lead to the creation of goal ambiguity and how goal ambiguity allows for the prioritization of some goals over others. Environmental state agencies are varied in structure across the 50 states, making them an

adequate sample with which to test hypotheses about structure. This small-scale study prompts many questions about the effect of competing goals on agency behavior. Since agencies combining public health and environmental protection seemed to show preference to public health programming, I suspect that various structures may lead to respective levels of goal ambiguity, impacting agency behavior—although that was not determined here, other than the behavior of showing preference. Future research should expand the scale of this study, along with asking questions about what these findings mean for the behavior of agencies and the environmental quality of the states. By constructing a measure of goal ambiguity, describing the difficulty of identifying primary agency goals, statistical tests could be performed that measure what effect varying levels of ambiguity have on how many inspections an agency performs, how many violations they assign polluters, how much money they receive from the federal government in grants, etc.

In addition, it is important to make this study more generalizable. Because this study only evaluates the annual reports of the five states that combine public health and environmental protection, we cannot assume that this disproportionate focus is more detrimental than the distribution of state resources that occurs with independent agencies. The annual reports of other states should be evaluated, in order to make comparisons. This study simply illustrates how *combined* public health and environmental protection agencies prioritize *their* focus. Also, other state agencies that combine functions should be evaluated, in order to determine if combination leads to disproportionate focus, across agencies. Finally, the relationship between the theories of organizational structure and goal ambiguity should be better defined, in order to truly understand the potential interaction that occurs between the two theories.

While Whitford and Sinclair (2012) have recently published a study on the factors that *lead* state environmental agencies to adopt mixed-function agencies (population, political culture, health conditions, etc.) the impact of this decision is relatively unclear in its benefits or consequences for environmental protection efforts, specifically. This paper attempts to gauge some of the impact of combining agencies, but the combination of single agencies into one potentially changes *many* aspects of the agency decision-making process, including decisions about federal grants, programming, and the distribution of resources. All of these things should be considered in the future when attempting to describe the relationship between goal conflict and agency behavior.

As a closing remark, the implications of this research are broad in scope. Understanding how bureaucratic structure and goal ambiguity impact agency behavior and success may aid in improving and/or maintaining environmental conditions. Environmental agencies were chosen for this study because they vary in structure and programs/services across states, and the outputs of these state agencies affect conditions that are capable of impacting an entire state population—or even the populations of neighboring states. In addition, environmental conditions and their impact on health must be measured and dealt with correctly, as the risks of environmental conditions must be understood in order to protect the population from involuntary contamination, disease, and long-term health complications (Hays, et al. 1996; Fehr, 1991). Efficient public health and environmental protection programs are vital for a healthy public; therefore, knowing which structures lead to better agency outcomes should aid states in making better organizational choices.

Table 1: Structural Types across States

Structural Type	States
Single-Function: Environmental Protection	AL, AR, AZ, CA, ID, IL, IN, KY, LA, MA, MD, ME, MI, MN, MS, MT, NE, NH, NM, OH, OK, OR, PA, SD, TX, UT, VA, VT, WA, WV, WY,
Multi-Function: Natural Resources & Environmental Protection	AK, FL, GA, IA, MO, NC, NJ, NV, NY, RI, TN, WI
Multi-Function: Public Health & Environmental Protection	CO, HI, KS, ND, SC
Multi-Function: Natural Resources, Energy, and Environmental Protection	CT, DE

Table 2: Proportions of Text Topics

TOPIC	FREQUENCY	PROPORTION	CUMULATIVE
Environmental Protection	123	.19	.19
Public Health	391	.60	.79
Combined	69	.10	.89
Other	74	.11	1.0
TOTAL	657	1.0	

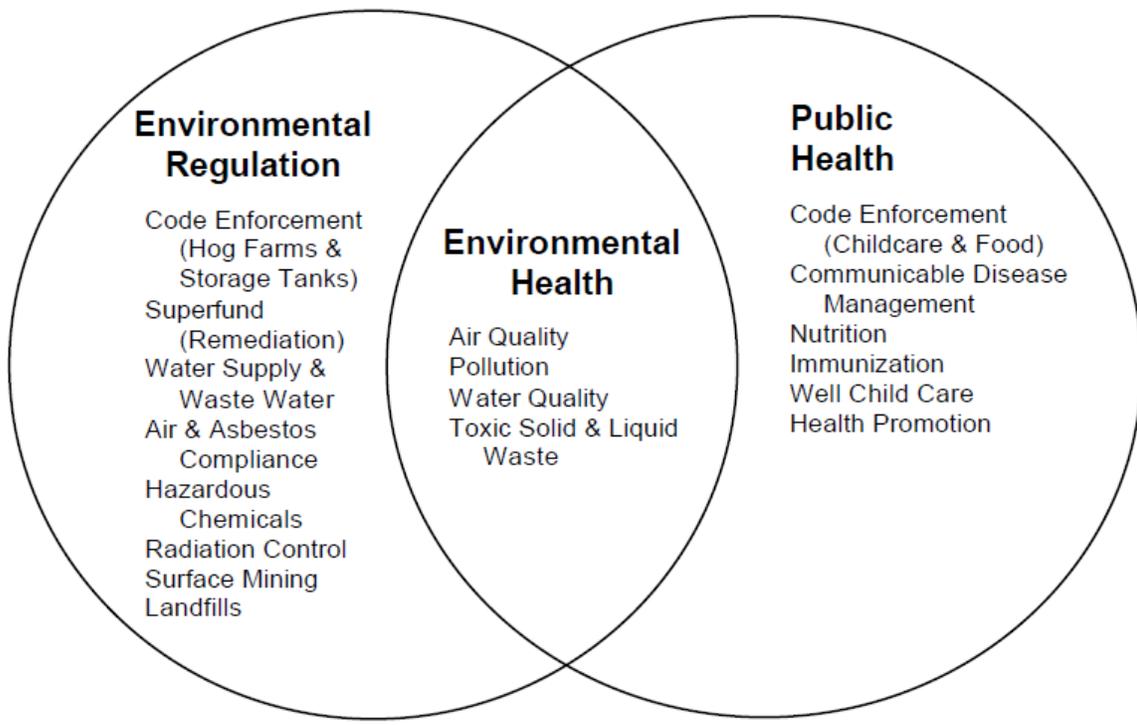
No sampling errors were calculated due to the data being a census of the population of texts

Table 3: Marascuilo Contrasts

Environmental Protection	Public Health	Combined	Other
.1872 _{a,d}	.5951 _b	.1050 _{c,d}	.1126 _{a,c,d}

Note: Estimates that share subscripts do not differ at $p < .05$

Figure 1: Environmental Regulation, Public Health, and Environmental Health



Source: *The Organization of Public Health and Environmental Functions in Kansas (1999)*

Figure 2: State of Hawaii Department of Health Organizational Chart
 Source: Hawaii Department of Health Website

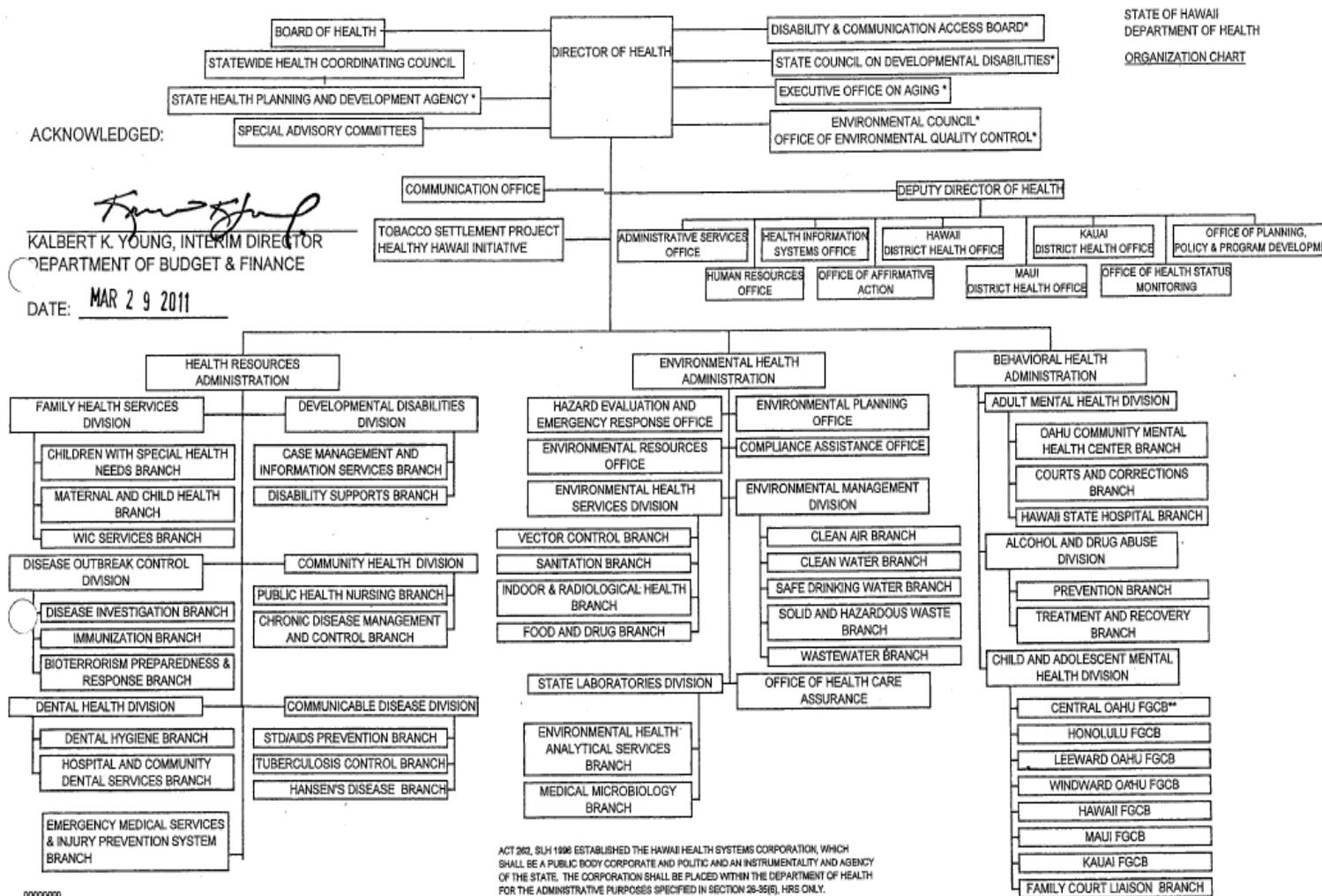
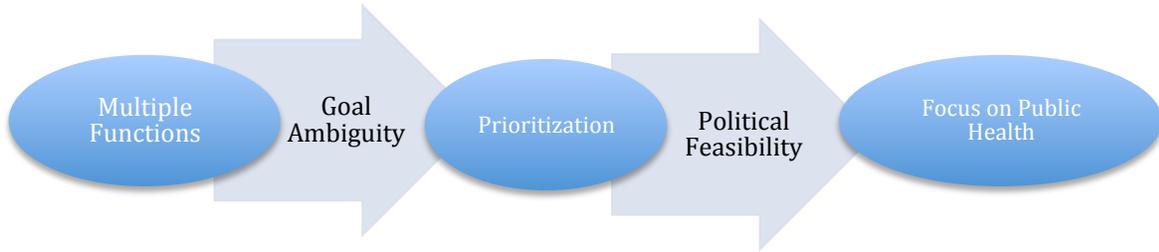


Figure 3: Theoretical Flow Chart



APPENDIX A

COMBINED ENVIRONMENTAL/PUBLIC HEALTH STATE AGENCY

CODEBOOK

By: JoyAnna S. Hopper

The purpose of this content analysis is to code the descriptive materials of state agencies that have combined environmental protection and public health efforts under the jurisdiction of one umbrella-like agency. You will be coding specific descriptive materials pulled from the agencies' websites, including agency strategic plans and annual reports. You will be asked to code the main topic of each descriptive block of text.

Definitions of Concepts

Main Topic:

Each block of text will be coded by its main topic. For the purpose of this study, the main topic is defined as the block of texts' main focus. More specifically, the topic of a block of text should be determined by the mention of public health or environmental protection effort(s) and/or concepts, as defined below. If both types of efforts and/or concepts are mentioned, the effort or concept mentioned most frequently in the block of text should be considered the main topic. If both types of efforts or concepts are mentioned in the same frequency, the block of text should be coded as being a combined effort. There is also an option for blocks of text that contain no relation to environmental protection or public health.

Environmental Protection Efforts & Concepts:

Environmental protection efforts and concepts are defined as any mention of efforts or concepts strictly dealing with the protection of the environment. These mentions could include descriptions of site cleanup efforts, drinking water quality standards and/or regulations, waste water, air quality standards and/or regulations, clean environment goals, hazardous waste, pollution, recycling, climate change, environmental quality, and a variety of other environmentally focused efforts and concepts not mentioned here.

Environmental protection efforts/concepts should not include combined health/environmental efforts or concepts, including disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.).

Public Health Efforts & Concepts:

Public health efforts and concepts are defined as any mention of efforts strictly dealing with the physical or mental health of the state population. These mentions could include descriptions of vaccination distribution, food sanitation efforts, specific disease control efforts (e.g., H1N1 flu, sexually transmitted diseases), nutrition services, mental health care, public health, and a variety of other health-focused efforts or concepts not mentioned here. Public health efforts and concepts should not include combined health/environmental efforts/concepts, including environmentally caused disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.).

Combined Efforts & Concepts:

Combined environmental protection and public health efforts and concepts are defined as any mention of efforts or concepts dealing with both the protection of the environment and the physical health of the state population. These mentions could include descriptions of environmentally caused disease prevention (e.g., asthma control efforts, water-borne illnesses control efforts, etc.), health inequalities due to environmental justice issues, or various other efforts/concepts that state a combined effort not mentioned here.

Coding Instructions

For each piece of descriptive material, please follow the instructions listed below:

On your coding spreadsheet, you will see options for state, descriptive material type/title, text block number, and framing topic.

1. First, determine the state being described in the agency material, and write the state's name under the spreadsheet heading "State Name."
2. Next, determine the type/title of the descriptive material you are coding, and write the type/title of the descriptive material under the spreadsheet heading "Descriptive Material Type/Title."

3. Next, number each block of text in the descriptive material (1-?) and place the corresponding number under the spreadsheet heading “Text Block Number.”
4. Next, determine the page number of the descriptive text by looking in the corners of the page (some material may have two pages to a single sheet, which means there may be two page numbers for one sheet). Place the corresponding number under the spreadsheet heading “Page Number.”
5. Finally, for each block of descriptive text, please code by answering the following question:

What is the main topic of the block of text?

1. Environmental protection
2. Public health
3. Combined
4. Other

6. The number you choose should be placed under the spreadsheet heading “Main Topic.”

**A “block of text” is defined as any substantial break in text, including indented paragraphs, white space between blocks of text, and the start of a bulleted list. Charts, tables, tables of contents, picture captions, organizational maps, etc. should not be coded.

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