ELABORATING A MODEL OF CULTURAL EXCHANGE: AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN ORGANIZATIONAL CULTURES AND THE ADOPTION OF ENVIRONMENTAL CERTIFIED MANAGEMENT STANDARDS

by

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A DISSERTATION

Presented to the Department of Management
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

March 2016

DISSERTATION APPROVAL PAGE

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Title: Elaborating a Model of Cultural Exchange: An Investigation into the Relationship Between Organizational Cultures and the Adoption of Environmental Certified Management Standards

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Degree awarded March 2016

DISSERTATION ABSTRACT

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Doctor of Philosophy

Department of Management

March 2016

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In this dissertation, I investigate how organizations understand and apply shared meanings of sustainability. Integrating recent theoretical developments regarding organizational culture with findings from prior literature suggesting that corporate codes can be effective instruments for shaping employee behavior, I describe the flexible exchange of cultural meanings and practices between organizations and their environment with respect to the adoption of environmental certified management standards (ECMS).

Taking an inductive, mixed methodological approach, I first use cultural consensus modeling survey techniques to analyze the types of situations vineyard managers in Oregon and Washington categorize as sustainable management conventions and the consistency of these categorizations among those organizations that have adopted ECMS and those organizations that have not. I then draw on interview and archival data to gain deeper insight into the survey findings, focusing on the nature of the relationship between the adoption of ECMS and managerial knowledge around shared meanings and practices regarding sustainability.

I find that the adoption of ECMS is associated with an alignment among organizations regarding how they understand and apply sustainability, with three characteristics enhancing the effectiveness of ECMS in cultivating alignment: detailed practice descriptions, demanding objectives to achieve and maintain, and industry specificity. I further uncover that key activities involving the interaction of ECMS and ECMS members facilitate this alignment in cultural meanings and practices surrounding sustainability. From these findings, I develop a grounded conceptual model of cultural exchange, describing how organizations serve varying roles in the cultural exchange process and how each role leverages a set of specific mechanisms to facilitate the adaptation, generation, and transfer of existing and new cultural meanings and practices between organizations drawing on a shared cultural repertoire.

The findings from this study contribute to enhancing our theoretical understanding of organizational culture as an open system through a more complex, intentional, and hierarchical account of cultural exchange, as well as develop insight into how the substantive adoption of ECMS practices is associated with alignment among organizations regarding cultural meanings and practices regarding a salient issue in an industry, such as sustainability.

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Lahneman, B. 2015. In vino veritas: Understanding sustainability with environmental certified management standards. *Organization & Environment*, 28, (2), 160-180.

Howard-Grenville, J., Bertels, S. P., & **Lahneman, B.** 2014. "Sustainability: How it shapes organizational culture and climate" for *Handbook of Organizational Climate and Culture: An Integrated Perspective on Research and Practice*. (edited by B. Schneider & K. M. Barbera). Oxford. 257-275.

ACKNOWLEDGMENTS

I wish to express sincere gratitude and appreciation to Professor Jennifer Howard-Grenville for her assistance, feedback, and support in completing this dissertation and navigating the Ph.D. program. In addition, I wish to express sincere appreciation to Professors Michael Russo and Reut Livne-Tarandach for their assistance in the preparation of this manuscript and support throughout the doctoral program. Special thanks are due to Professor Sara Hodges, who helped in deepening my analysis and contribution to the academic literature. I owe a deep gratitude to my husband, Blake Boren, for his unwavering support and encouragement over the course of this degree. In closing, I wish to express genuine thanks to the Lahneman family and my Ph.D. colleagues at the University of Oregon for their personal and professional support over the Ph.D. journey.

I dedicate this dissertation to my husband, Blake. Thank you for your love, patience, and support.

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CHAPTER I

INTRODUCTION

In recent years, there has been a resurgence of interest in research regarding organizational cultures, often described as being 'how things are done' in a particular organization (Smircich, 1983). In particular, scholars are advancing Swidler's (1986; 2003) framework of viewing culture as a repertoire of cultural resources, used by organizational actors in varying ways to create strategies of action when faced with a range of organizational issues. Termed the "second wave of cultural research," at a higher level of analysis, Weber & Dacin (2011) emphasize the importance of understanding how organizations understand, access, and deploy diverse cultural materials across organizational boundaries. This is a new and promising direction for organizational culture research and theory, which hitherto focused on cultural processes primarily occurring inside organizational boundaries (Giorgi, Lockwood, & Glynn, 2015; Weber & Dacin, 2011). Notably, an open systems perspective of organizational culture has potential to provide a framework within which researchers can link macro-level shifts in 'how things are done' at industry or societal levels to changes in how organizations understand and apply *cultural conventions*, or widely held meanings, that guide organizational action (Atran, Medin, & Ross, 2005; Giorgi et al., 2015; Weber & Dacin, 2011).

This dissertation aims to do just this, in the context of business sustainability in the Pacific Northwest wine industry. Business sustainability refers to the challenge to organizations to improve social welfare and reduce their ecological impact while ensuring the effective achievement of organizational objectives (Sharma, 2003). Organizations are increasingly interested in embedding sustainability at every level of their operations in order to be better prepared to tackle issues such as climate change, natural resource scarcity, supply chain pressures, and other global economic and societal challenges, as well as address customers' demands for greener activities and products (Bertels, Papania, & Papania, 2010; Ceres, 2010; Waddock et al., 2002). A common approach to addressing these issues is the adoption of environmental certified management standards (ECMS), which range in focus from general (e.g., ISO 14001) to

industry-specific (e.g., Forest Stewardship Council) (Howard-Grenville, Bertels, & Lahneman, 2014; Terlaak, 2007). Typically, the practices included in an ECMS are standardized at a supra-organizational level to provide an organization with a set of strategic practices with which to address the collective issue of sustainability, and also to signal a commitment to sustainability to influential stakeholders external to organizational boundaries (Barnett & King, 2008; Terlaak, 2007).

Interestingly, from a cultural perspective, the adoption and integration of ECMS practices ostensibly alters 'how things are done' in an organization (Howard-Grenville et al., 2014). In this framework, the integration of standardized environmental practices may be related to changes in how organizations understand, and thus act on, sustainability as a set of practices, or conventions. Prior studies have demonstrated that corporate codes and standardized practice schemes can be effective instruments for conditioning employee behavior, and suggest that corporate culture plays a role in this process (Canato, Ravasi, & Phillips, 2013; Marnburg, 2000; Stevens, 2007). Indeed, there is evidence that organizations are increasingly using ECMS as tools to infuse their cultures to encourage more sustainable behaviors in their employees (OECD, 2008; Unruh & Ettenson, 2010). However, there is currently a distinct lack of research regarding whether and how the integration of standardized practices required by ECMS might condition the cultural understandings and applications of sustainability conventions in adopting firms (Howard-Grenville et al., 2014), and particularly regarding differences between types of ECMS. This is where the recent developments in organizational culture theory regarding an open systems perspective offer promise for fruitful research.

Prior research suggests that assessing the cultural understandings held by organizations surrounding cultural conventions in an industry is a key aspect to gaining insight into how and why organizations engage in particular practices related to those conventions (Atran et al., 2005; Keller & Loewenstein, 2011). Building on this prior research, in this dissertation I investigate whether and how the adoption of an ECMS is related to how organizations understand and apply sustainability cultural conventions. The overarching research question that motivates this dissertation is: How does the integration of standardized sustainability practices have bearing on the underlying meanings that guide everyday organizational practices surrounding sustainability?

Furthermore, at a higher level, this study investigates how organizations understand and apply cultural resources related to sustainability that have been standardized at the industry level. Do organizations that have adopted standardized sustainability practices develop higher levels of competencies surrounding industry level sustainability conventions relative to non-adopting organizations? If so, what are the mechanisms underlying the process of competency development? Or, does the adoption of standardized practices limit the extent to which these organizations can understand and act on sustainability issues, particularly when faced with novel situations and challenges?

With evidence in practice that ECMS are increasingly being adopted by organizations across a range of industries, these are important questions for management researchers to investigate (OECD, 2008; Unruh & Ettenson, 2010). Currently, however, we have little prior research in the management literature with which to address these topics. Organizational culture offers a promising theoretical lens with which to examine the effects of ECMS adoption on organizational understandings of sustainability conventions, suggesting that the standardized practices included in an ECMS could provide a model for "new ways to organize action" (Swidler, 1986, p. 280) that could both enable and constrain action surrounding sustainability in adopting organizations. Thus, in this dissertation I explore these questions by taking an inductive approach in a mixed methodological study to investigate how the integration of ECMS practices is related to cultural understandings and applications surrounding sustainability conventions across multiple organizations in the same industry.

I conduct this study in the context of the regional Pacific Northwest wine industry. This regional industry is primarily composed of Oregon and Washington states, which have similar demographics and histories. The Pacific Northwest wine industry is an appropriate context for this study as, overall, it has experienced rapid growth in industry-specific ECMS development and adoption in the past decade. However, within each state industry, companies have adopted ECMS at different rates, with Oregon leading in ECMS adoption and Washington lagging behind.

Regarding the mixed methodological approach, I collected and analyzed data from a survey, interviews, and archival documents in two stages of empirical research. In the first stage, I utilized cultural consensus modeling (CCM) survey techniques to assess

the types of situations that vineyard managers in this regional wine industry categorize as sustainable management. As a first step in CCM, I conducted qualitative in-depth interviews with vineyard managers in Oregon and Washington to identify sustainability cultural resources residing in the cultural register of the Pacific Northwest wine industry through the analysis of sustainability practices perceived as common or appropriate. These practices were utilized to generate items on the CCM survey; I then analyzed whether these categorizations were consistent among those organizations that had adopted an ECMS and those organizations that had not. These results provided a measurement of cultural competencies regarding sustainability cultural resources held by vineyard organizations in Oregon and Washington. I further investigated the results of the survey with a second round of qualitative research. To this end, I conducted in-depth interviews with vineyard managers with low and high levels of cultural competencies to gain deeper insight into whether and how ECMS adoption has played a role in their understanding of sustainability management practices. I drew on archival and interview data pertaining to LIVE, the ECMS that emerged from the survey as being the most strongly associated with both cultural consensus and high cultural competencies regarding sustainability among adopting organizations. The archival data included minutes from LIVE's Board of Directors' meetings, newsletters, blogs, press releases, and news articles over the period 1999 to 2014, which were analyzed primarily to track key activities that LIVE has pursued over time. I followed up this analysis with in-depth interviews with members of LIVE's board of directors in order to map the development of LIVE as an ECMS and LIVE's philosophy regarding sustainability over time, as well as corroborate key activities found in the archival analysis.

From the first stage of empirical research, I find that the adoption of an ECMS is indeed associated with an alignment among organizations regarding how they understand and apply sustainability, supported by both quantitative and qualitative analyses. Further analysis of the interview data uncovers that three characteristics of an ECMS enhance its association with alignment in sustainability meanings among adopting organizations: detailed practice descriptions, demanding objectives to achieve and maintain, and practices and guidelines adapted specifically to the industry (i.e., not generic). Out of the three ECMS available to vineyards in the Pacific Northwest, LIVE demonstrates the

closest adherence to these three characteristics, and relatedly emerges as having the strongest association with consensus regarding sustainability meanings and practice.

In the second stage of empirical research, I focus only on the ECMS LIVE – to qualitatively investigate the process by which alignment of sustainability meanings and practices occurs. Through analysis of the interview and archival data, I find evidence of cross-boundary cultural processes that involve the exchange of cultural resources between the LIVE governing organization (LIVE), vineyard organizations, and research organizations. Prior literature has characterized such a cultural exchange only as a bidirectional process between two organizations called cultural cultivation (Harrison & Corley, 2011), in which a focal organization exports existing cultural resources to an external group and imports new cultural resources from the same external group. I build on this prior research to investigate a complex set of cultural exchanges between LIVE, LIVE members, and scientific organizations. I draw on my analysis to develop a grounded model describing a more complex cultural exchange process than has been previously conceptualized, in which LIVE serves a bridge between research organizations and LIVE members, to both adapt and generate new cultural resources and make them available to LIVE members. The grounded model of cultural exchange introduces two novel notions in organizational culture theory: i) that organizations serve distinct roles in the cultural exchange process, and ii) that each role leverages a distinct set of mechanisms to facilitate the intentional adaptation, generation, and transfer of existing and new cultural meanings and practices to organizations drawing on a shared cultural repertoire.

The findings of this dissertation have three primary implications for management theory and practice. First, this dissertation makes an important contribution to organizational culture theory by deepening our understanding of organizational culture as an 'open' system in which organizations engage in a dynamic exchange of cultural meanings and practices with sets of collective meanings that reside both external to and at a higher level than the organization. The findings of this dissertation suggest that when multiple organizations engage simultaneously in cultural exchange with a shared external group, their cultural meanings and practices surrounding a salient issue can be aligned with those not only of an external group, but also among multiple organizations. The

model develop conceptualizes the cultural exchange process as being more complex, intentional, and hierarchical than has been previously conceptualized in the management literature. This work extends prior research characterizing organizational culture as an isolated or 'closed' system in which organizational cultures are constituted primarily by the meanings and practices developed and enacted by individuals within organizational boundaries. As this dissertation focused on cultural exchanges at the organizational level, future research could examine the role of individual organizational members in cross-boundary cultural exchange processes to provide a more fine-grained understanding of the mechanisms at work.

Second, this dissertation enhances our theoretical understanding of how organizational culture and standardized practices interact, and shape each other. Specifically, this work demonstrates the utility of standardized practices as templates for cultural meanings upon which organizations can draw to frame meanings and practices in a coherent, concrete way. Whereas prior research has primarily focused on the symbolic aspects of adopting standardized practices as stakeholder signaling devices, this research draws attention to the need for organizations to substantively adopt standardized practices if the motivation of the adopting organization is to enact cultural change. This research further suggests that through the promotion of substantive adoption, organizations and industry-related associations can utilize standardized practices as tools with which to instigate cultural alignment around a salient issue among organizations in an industry. This work identifies key roles and activities that both organizations and industry-related associations should take to encourage this cultural alignment. Future research could deepen and extend the work of this dissertation by examining the generalizability of these findings across industry contexts, among organizations, and with various sets of standardized practices.

Third, in a contribution to management practice, this dissertation draws attention to the utility of formulating detailed, rigorous, and industry-specific ECMS programs to serve as tools with which organizations, industry associations, and other stakeholder groups can encourage cultural alignment in meanings and practices toward sustainability across organizations. As such, this work extends prior research focusing on ECMS utility as symbolic marketing tools, by illuminating processes and mechanisms by which

organizations engage in substantive adoption of ECMS practices. This work provides insight into how organizations draw on ECMS programs as tangible means by which to understand and act on sustainability in everyday organizational life. In this way, this research identifies key roles and mechanisms in which an ECMS board of directors and managers can engage to promote cultural exchange between the ECMS and adopting organizations. Future research could build on this dissertation to further help delineate structured roles and activities in which organizational managers and ECMS boards of directors should engage to promote substantive adoption of ECMS practices.

This dissertation begins with an overview of the literature regarding organizational culture, focusing on concepts related to culture as a repertoire, cultural consensus theory, and an open systems cultural perspective including cultural cultivation. Next, I explain the methodological approach of this study, encompassing the collection and analysis of data from both qualitative and quantitative sources in three phases. Then, I review the empirical findings from the three phases of qualitative and quantitative data gathering and analysis. Finally, I discuss the implications of developing theory describing how organizations understand and apply cultural resources standardized at an industry level, as well as the limitations of this study. I conclude with a discussion of future research to be pursued to extend and deepen the findings and contributions of this study.

CHAPTER II

LITERATURE REVIEW

In this section, first I review a background of theories related to organizational culture; then I provide a brief description of ECMS and how these tools have been talked about in the literature.

Organizational Culture

The cultural construction of organizational life has been discussed in various ways within management literature. Over time, the conceptualization of organizational culture has evolved from a monolithic structure guiding collective behavior to an individually-enacted, emergent construct describing "the way things are done" in an organization (Giorgi et al., 2015; Martin, 2002). More recently, research demonstrates that the 'repertoire' perspective of culture is a solid foundation on which to define and pursue empirical studies regarding cultural processes in organizations (Giorgi et al., 2015; Weber & Dacin, 2011). Additionally to note, with the growing consensus regarding the repertoire perspective of organizational culture, organizational researchers are emphasizing the need to better understand how cultures can be shared and interpreted across organizational boundaries (Weber & Dacin, 2011).

Overview of organizational culture in the management literature. The concept of organizational culture has developed over time within the organization theory literature, emerging at first as a set of broad, disparate concepts, with more recent movement toward more consensus on shared definitions. Concepts describing what was eventually formally called "organizational culture" emerged as early as the 1950s and 1960s; however this term was not formalized as a framework or construct until the late 1970s and 1980s (Meyerson & Martin, 1987; Pettigrew, 1979; Ouchi & Wilkins, 1985; Smircich, 1983; Swidler, 1986; Wilkins & Ouchi, 1981). During the 1980s, organizational culture became a popular construct for scholars interested in analyzing the performance of and behaviors within organizations (Martin, 2002). However, referencing this approach to culture, Smart & St. John (1996) expressed concern "that the lack of a precise definition of the concept and the paucity of empirical evidence supporting current popular claims may ultimately result in organizational culture being

regarded as no more than another passing social science fad" (p. 219). In fact, during the 1990s many scholars recognized the ambiguity of the definition of organizational culture and called for both consensus on a more specific definition and empirical studies in which to demonstrate such definitions (Denison & Mishra, 1995; O'Reilly, Chatman, & Caldwell, 1991; Smart & St. John, 1996; Schein, 1996).

Currently, though several theoretical perspectives are still employed, there is growing consensus by organizational scholars that overall a multi-level view of organizational culture promises to deliver greater generalizability in empirical findings (Weber, 2005; Weber & Dacin, 2011). Recently gaining in popularity among cultural researchers in the management field, the introduction of an *open systems* perspective of culture as a *repertoire* holds promise for scholars to investigate social processes involving the interaction of actors across cultural groups, along with the ability to once again consider identifying and comparing aspects of organizational cultures (Weber, 2005; Weber & Dacin, 2011). I define these perspectives below.

Important to note, these conversations surrounding different theoretical perspectives on organizational culture continue today, with many of these approaches converging or diverging on key issues (Martin, 2002; Weber & Dacin, 2011). As such, these parallel conversations require a researcher to clearly indicate which sets of theories are being utilized when conducting research with an organizational cultural lens. In this dissertation, I first review the main perspectives taken in organizational culture theory, and then establish the sets of theories to be utilized in this study.

Early conceptions of culture: Culture as a monolithic, constraining force. In the 1970s and 1980s, organizational scholars envisioned culture as being a collectively held, organizational level social structure (Martin, 2002). The two main approaches of the time conceptualized culture as a *variable* or a *root metaphor*: the first emphasizing the causal nature of culture and then the second emphasizing the guiding influence of culture on individual and collective behavior (Martin, 2002). Viewing culture primarily as a collective construct, neither the variable nor the root metaphor perspectives regarded organizational culture as a multi-level construct; as such, neither conceptualization took account of processes occurring at a micro-level. Concepts from these earlier conceptualizations of organizational culture are still employed today, though many of the

concepts have evolved with the integration of more agentic views (Martin, 2002). Overall, as we will see with current developments in cultural theory, it is important to understand interactions between the collective and individual levels in order to gain more insight regarding how the cultural context of an organization can shape individuals' actions in their daily life within the organization (Weber & Dacin, 2011).

Culture as a variable: Measurable and functional. The variable perspective viewed culture as a construct that could be manipulated to a specific purpose and then generate desired outcomes (Martin, 2002; Meyerson & Martin, 1987; Ouchi & Wilkins, 1985; Smart & St. John, 1996; Smircich, 1983; Wilkins & Ouchi, 1983). Treated as such, scholars were interested in establishing a causal link between organizational culture and effectiveness, performance, or other outcomes, likening culture to a "lever or key by which strategic managers can influence and direct the course of their organization" (Smircich, 1983, p. 346). Culture could thus be a variable in various ways: internal or external, objective or subjective, public or private, explicit or implicit, holistic or specific, strong or weak (Hatch, 1993; Martin, 2002; Meyerson & Martin, 1987; Ouchi & Wilkins, 1985; Wilkins & Ouchi, 1983).

Researchers found the variable perspective attractive because it allowed an organizational culture to be measured according to dimensions, which could then be used to provide managers with theoretical tools to enhance performance in their respective organizations (Barney, 1986; Denison & Mishra, 1995; Meyerson & Martin, 1987; O'Reilly et al., 1991; Schein, 1996). Considered a functional approach to culture, Martin (2002) stated that this approach offered "the promise, to the delight of many managers, that a 'strong' culture (one that generates much consensus among employees of an organization) will lead to outcomes most top executives desire to maximize, such as greater productivity and profitability" (p. 4). In this way, many earlier empirical studies focused on measuring cultural dimensions, which they used to compare one organizational culture to another in order to draw conclusions regarding organizational outcomes, such as employee loyalty, competitive advantage, and financial performance (Barney, 1986; Buono, Bowditch, & Lewis, 1985; Ouchi, 1981; Ouchi & Johnson, 1978; Schein, 1983; Wilkins & Ouchi, 1983).

Given all the promise to predict organizational outcomes, the variable approach as

a theoretical framework for culture lost favor among scholars, primarily because the causal links between culture and performance remained ambiguous. Seemingly, the failure of the variable approach was quickened by the introduction of a different perspective of culture, which called for different approaches and methodologies (Martin, 2002; Meyerson & Martin, 1987; Schein, 1996; Smircich, 1983; Swidler, 1986). However, as we will see later on with current operationalizations of culture in anthropology, the statement by Martin (2002) regarding viewing culture as consensus is enjoying a resurgence, but toward the differing aim of incorporating more agency into cultural theory (Bernard, 2006).

Culture as a root metaphor: Stabilizing and emergent. This opposing approach to conceptualizing organizational culture was that of culture being a root metaphor, which quickly gained a following by researchers seeking to gain a deeper understanding of cultural processes instead of the "thin description" that quantitative research regarding culture as a variable provided (Martin, 2002). Smircich (1983) stated: "Some theorists advance the view that organizations be understood as cultures. They leave behind the view that a culture is something an organization has, in favor of the view that a culture is something an organization is" (p. 347). Whereas the variable approach treated culture as something that an organization possessed and could manipulate, the root metaphor approach treated culture as a manifestation of the organization and the people within it as a whole (Hatch, 1993; Meyerson & Martin, 1987; Smircich, 1983). In this way, organizational culture was presented as a metaphor for the organization, and thus, organizational change was rooted in cultural change (Martin, 2002).

This approach also incorporated aspects of cognitive level processes in the development, use, and maintenance of cultural artifacts, such as symbols, rituals, myths, stories, and language at the organizational level (Smircich, 1983). According to Smircich (1983):

> When culture is a root metaphor, the researcher's attention shifts from concerns about what do organizations accomplish and how may they accomplish it more efficiently, to how is organization accomplished and what does it mean to be organized? (p. 353)

Thus, cognitive processes as manifesting in shared symbols represented the shared culture of an organization. In order to understand such processes and shared meanings,

researchers found qualitative methods more useful and so focused on a deep understanding of one or few organizations rather than comparing large samples of many organizations at a surface level (Martin, 2002).

Throughout the late 1980s and 1990s, the perspective of organizational culture as a root metaphor gained consensus and evolved as a concept. Scholars adopted and built on this approach, enhancing this view by focusing on the symbolic nature of cultural artifacts and values as the source of unique cultures in organizations (Hallett, 2003; Hatch, 1993; Lounsbury & Glynn, 2001; Martin, 2002; Meyerson & Martin, 1987; Morrill, 2008; Schein, 1996; Smart & St. John, 1996). The view of culture as being the "deep structure" of an organization developed from the root metaphor perspective as culture being "what an organization *is*" rather than "*has*" (Martin, 2002; Meyerson & Martin, 1987; Smart & St. John, 1996; Swidler, 1986; Weber, 2005; Weber & Dacin, 2011). This deep structure perspective viewed culture as being rooted in an organization's assumptions and values, with cultural artifacts being the manifestation of this structure of shared symbolic understandings (DiMaggio, 1997; Hatch, 1993; Martin, 2002; Meyerson & Martin, 1987; Weber, 2005). As Hatch (1993) explained, this perspective implied a tiered production of culture:

> The values themselves are constituted by perceptions, cognitions, and emotions activated by cultural assumptions. ... Artifacts are the visible, tangible, and audible results of activity grounded in values and assumptions (659-664)

Scholars regarded artifacts as being composed of rituals, language, symbols, stories, and myths, and thus culture was very much observable, although perhaps not exactly measurable quantitatively (Martin, 2002).

Symbolic interaction: A move toward agency in cultural theory. Moving away from collective-based cultural concepts central to the variable and root metaphor perspectives of culture, theories of *symbolic interaction* more overtly emphasize agency in the conceptualization of organizational culture, focusing more on culture as a context in which individuals are embedded rather than an encompassing structure (Martin, 2002). In the view of culture as a deep structure, symbolic interpretation and the role of cognitive processes gained attention, focusing on culture as a system of shared symbols and meanings at the collective rather than individual level (DiMaggio, 1997; Hallett, 2003; Lounsbury & Glynn, 2001; Meyerson & Martin, 1987; O'Reilly et. al., 1991;

Schein, 1996; Smircich, 1983; Swidler, 1986; Weber, 2005). Researchers adopting a symbolic interaction perspective of organizational culture are more focused on investigating the use of culture within an organization rather than the production of culture (DiMaggio, 1997; Hallett, 2003). In this way, the symbolic interaction lens of culture focused on the micro-interactions of individuals within an organization, bringing the focus to individuals as having agency and power within a collective (Fine, 1995; Hallett, 2003).

Negotiated order. When taken together with the deep structure and root metaphor views of culture, the symbolic interaction view of culture advances organizational culture theory by embedding agency more overtly within a dynamic view of culture (DiMaggio, 1997; Hallett, 2003; Hatch, 1993; Lounsbury & Glynn, 2001; Martin, 2002; Morrill, 2008; Swidler, 1986). Instead of defining culture as a static, stable metaphor for an organization based on tangible artifacts, integrating concepts from symbolic interaction evolves culture to being primarily based on the interpretations of the meanings attached to the cultural artifacts (Fine, 1995; Hatch, 1993; Martin, 2002). Hatch (1993) stated: "From the cultural dynamics perspective, these ideas suggest that artifacts must be translated into symbols if they are to be apprehended as culturally significant objects, events, or discourses" (p. 670). Thus, the concept of organizational culture remained as something an organization "is" rather than "has," but it evolved into a more dynamic, cognitive, symbolic exchange of shared meanings among members of an organization (DiMaggio, 1997; Hallett, 2003; Hatch, 1993; Lounsbury & Glynn, 2001; Martin, 2002; Morrill, 2008).

This view of culture as negotiated order draws the notion of agency even further into the concept of culture and presents a view of dynamic, daily culture formulation by individuals. This focus on micro-interactions between individuals in an organization who use negotiation to achieve and maintain power – from which a culture emerges – sets the stage for further attention to our need to better understand micro-level processes in cultural studies (Martin, 2002). However, negotiated order emphasizes power and interactions, and thus offers an incomplete perspective on the agentic processes in organizational culture, or how actors interact with the cultural contexts in which they are embedded, concepts that are addressed more directly by the repertoire perspective of

culture.

Bringing the actor back in: A shift in organizational culture theory toward micro-level processes. Although published during the same period as the works describing culture as a variable or root, as a monolithic, collective constraining force on collective action, two conceptualizations of culture were introduced in parallel that explicitly brought agency into culture theory, but did not gain traction in organizational research until more recently. Based in sociology, Swidler (1986) provided a framework of *culture as a repertoire* that drew agency more explicitly into culture theory. At the same time, drawing on concepts based in anthropology and psychology, Romney, Batchelder, & Weller (1986) developed a theory of *culture as consensus*, using the construct of *cultural competence* to describe how individuals understand the cultures in which they are embedded. Both of these theoretical conceptualizations of cultures offer promise for cultural researchers seeking to illuminate ways in which individual actors understand and enact behaviors within the cultural contexts of their organizations (Weller, 2007; Weber & Dacin, 2011). Currently, the conversations surrounding repertoire and consensus continue to run in parallel to the root metaphor and symbolic interaction perspectives of culture (Martin, 2002). However, the repertoire and consensus perspectives of culture are increasingly being adopted as a theoretical lens for culture research; indeed, the primary theoretical lenses adopted for this study are the repertoire and consensus perspectives of culture, to be described below.

Culture as a repertoire. Swidler (1986, 2003) conceptualized organizational culture as being a collection of overlapping individual repertoires, or patterned behaviors, that actors compose by drawing on cultural resources from a register held collectively at the broader societal level to create strategies of action in response to everyday situations in organizational life. The repertoire perspective of culture "offers an image of culture as a 'tool kit' of symbols, stories, rituals, and world-views, which people may use in varying configurations to solve different kinds of problems" (Swidler, 1986, p. 273).

Organizational culture is thus composed of different meanings and practices, or cultural resources, and is experienced at different levels in organizational life, chiefly the collective and individual levels (Weber, 2005). At the organizational level, the cultural register contains "the entirety of cultural material at the disposal of individual actors or

collectives" (Weber, 2005, p. 228). In everyday organizational life, these cultural resources are accessed from a collective repertoire, and then combined and enacted in varying patterns as strategies of action by individual organizational members (Swidler, 1986). Significantly, the repertoire perspective of culture conceptualizes organizational culture as being a dynamic, multilevel construct enacted by agents situated in a collective cultural context (Weber & Dacin, 2011).

Overall, although actors conceivably draw from the same pool of cultural resources in the cultural register, enacted patterns of behavior can differ from actor to actor, or issue to issue; that is, actors ostensibly utilize the same resources, just in varying combinations (Swidler, 1986, 2003; Weber, 2005). In this way, the particular strategies of action drawn into use by an individual organizational member would depend largely on their own particular experience within organizational life, such as role held, status in the organization, skill set, and even personal characteristics (Kellogg, 2011). Importantly, the notion that strategies of action may be used differently by individuals, yet overlap in perhaps systematic ways, holds promise for investigating how cultural context may guide individual behavior.

Reconciling repertoire with prior cultural concepts. The repertoire view of culture repositions symbols, artifacts, and meanings as being more than part of an exchange process; instead these are cultural resources, strategically employed by organizational actors to solve the various issues that arise in their everyday life within the organization (Swidler, 1986, 2003; Weber, 2005; Weber & Dacin, 2011). However, this does not mean to imply that culture causes or shapes action directly, as was a tenet of the variable perspective of culture; rather "culture appears to shape action only in that the cultural repertoire limits the available range of strategies of action" (Swidler, 1986, p. 284). Culture in this sense is made up of collective, shared meanings, but which actors understand and employ uniquely within their respective organization to guide decision making and navigate organizational life (Martin, 2002; Swidler, 1986).

Culture as consensus and competence. Drawing on concepts based in anthropology and psychology, Romney et al. (1986) developed a theory of culture as consensus, using the construct of *cultural competence* to describe how individuals and cultural groups understand the larger cultures in which they are embedded. The

conceptualization of organizational *culture as consensus* offers promise for cultural researchers seeking to illuminate processes by which individual actors differently understand cultural conventions within the cultural contexts of their organizations (Keller & Loewenstein, 2011). *Cultural conventions* are socially legitimate ways to identify and interpret experiences in a cultural group that are learned by cultural members (Keller & Loewenstein, 2011).

In this section, I attempt to integrate anthropology-based concepts from cultural consensus theory (CCT) with sociological perspectives of culture, positing that viewing culture as an aggregation of individual cultural competences can complement the repertoire perspective. Overall, the perspective of culture as consensus and competence permits researchers to measure how much individuals and organizations know about the resources available in their organizational and industry registers (Romney et al., 1986); but it is important to note that this theoretical lens emphasizes agency in how individuals and organizations develop cultural knowledge, but does not necessarily lend insight into how individuals and organizations actually use that knowledge in everyday organizational action.

Cultural consensus theory. Romney et al. (1986) assert that CCT provides an objective means by which researchers can assess the content of a culture, and the extent to which individuals develop cultural knowledge and skill of cultural conventions as members of that cultural collective. In response to the reliance on ethnography in cultural anthropology research, Romney et al. developed a model that would permit a researcher studying a culture a more rigorous way to assess the accuracy of their ethnographic findings. The resulting cultural consensus model (CCM) attempts to account for the part of culture that is stored in the minds of its members, basing the model on the assumption developed by Roberts (1964) that culture is contained in, and therefore constructed by, information:

> It is possible to regard all culture as information and to view any single culture as an 'information economy' in which information is received or created, stored, retrieved, transmitted, utilized, and even lost.... In any culture information is stored in the minds of its members and, to a greater or lesser extent, in artifacts (p. 438-9)

The central idea in CCT is that a pattern of agreement or level of consensus among the members of a common culture aids researchers in making inferences about individuals'

differential competencies regarding the shared information pool, which theoretically constitutes culture (Romney et al., 1986). In this way, CCT holds that assessing the aggregated cultural understandings held by individuals surrounding cultural conventions in a collective, such as an industry, is a key aspect to gaining insight into how and why individuals and organizations engage in particular practices related to those conventions (Atran, Medin, & Ross, 2005; Keller & Loewenstein, 2011).

Viewing culture as consensus provides a framework in which researchers can qualitatively discover widely held cultural meanings – or conventions – and then quantitatively estimate the degree to which individuals and cultural groups know or understand those conventions (Romney et al., 1986; Weller, 2007). These estimates of individual or group level competencies can be aggregated to estimate of the agreement between individuals or groups on the content of their culture (Weller, 2007). Aggregation thus permits a cultural researcher to assess the pattern of understandings regarding cultural conventions held by members of a culture – whether individuals or groups – at a collective level; where a higher level of agreement between members indicates strong consensus on the nature and content of a set of higher-order cultural conventions that purportedly guide action (Weller, 2007). As with the repertoire perspective, CCT unambiguously conceptualizes culture as being a multi-level construct, and requires the participation of members in the collective construction of cultural life (Romney et al., 1986; Weller, 2007).

Interestingly, also like repertoire, CCT incorporates concepts from earlier theories of organizational culture. In particular, CCT proposes that individuals or groups have a certain level of competence regarding the content of their higher-order culture, and that this content refers to tangible and intangible artifacts such as values, assumptions, beliefs, symbols, stories, and language (Romney, Boyd, Moore, Batchelder & Brazill, 1996; Romney et al., 1986). This corollary to artifacts begins to draw together the beginnings of a coherent theory of culture that conceptualizes what management scholars are calling for: a multi-level, agency-oriented framework in which to examine cultural processes within and across organizations (Weber & Dacin, 2011).

However, a key difference between CCT and the repertoire perspective of culture is that CCT assesses the cultural knowledge held by cultural members, and does not

necessarily assess enacted behaviors (Romney et al., 1986). This difference is important to note because it is a key reason why CCT can utilize quantitative measurement methods to investigate culture, whereas researchers utilizing the repertoire theoretical lens often still need to rely on other qualitative methodological techniques to generate deep insight, such as qualitative data obtained in observations.

Ways forward for organizational culture research: Multi-level, open systems perspective. Recently gaining in popularity among cultural researchers in the management field, the integration of the perspectives of culture as a repertoire and consensus holds promise for scholars to investigate social processes involving the interaction of organizations across cultural groups, along with the ability to once again consider identifying and comparing components of organizational cultures (Weber, 2005; Weber & Dacin, 2011). In particular, a recent development in organizational culture theory presents an opportunity to explore questions regarding dynamic processes underlying the maintenance, change, and transfer of cultural resources by individuals and organizations across multiple levels of analysis: the introduction of the 'open systems' perspective of organizational culture (Giorgi et al., 2015; Weber & Dacin, 2011). I discuss this theoretical development in more detail below, highlighting concepts most relevant to this study.

An open systems perspective. Within the repertoire view, an *open systems perspective* of organizational culture has been introduced, providing a framework with which to conceptualize how cultural resources can be transferred across organizational boundaries in order to import new cultural resources into an organization's cultural register or infuse an organization's extant cultural materials into cultural registers outside of organizational boundaries (Harrison & Corley, 2011; Rindova, Dalpiaz, & Ravasi, 2011). With the introduction of an open systems perspective of culture, a call has emerged for greater understanding of how organizations can utilize cultural resources to formulate and enact strategies involving external audiences (Giorgi et al., 2015; Weber & Dacin, 2011). Two recently introduced theories describe processes involved in an open systems conceptualization of organizational culture: cultural cultivation and cultural enrichment.

Cultural cultivation. Harrison & Corley (2011) develop the concept of *cultural cultivation*, in which organizations engage in both infusing their own cultural register with new cultural resources from sources external to the organization, as well as seeding their external environment with their own cultural resources in an attempt to align external meanings with their own. This theory of cultural cultivation is developed through the analysis of an ethnography conducted at an outdoor equipment and clothing company, in which the authors analyzed the 'push' and 'pull' dynamics in the exchange of cultural resources between the organization and a community of rock climbing enthusiasts that serve as key patrons of the company. Cultural cultivation involves bidirectional processes of seeding and infusion, in which a focal organization engages in the export and import of cultural resources with an external group. Cultural seeding involves the transfer of organizational cultural meanings and practices from an organization to an external group; and cultural infusion involves the transfer of cultural meanings and practices from the external group into the organizational culture (Harrison & Corley, 2011). This model thus involves a simple bidirectional and dyadic exchange relationship, in which one focal organization imports and exports cultural meanings and practices (Harrison & Corley, 2011). This theory of cultural cultivation introduces the notion that the boundaries of an organizational culture are much more permeable than has been previously conceptualized, providing insight into how work practices shape and are shaped by practices that develop in groups external to an organization (Harrison & Corley, 2011; Weber & Dacin, 2011).

Cultural enrichment. Rindova et al. (2011) describe the process by which new cultural resources are incorporated into an organization's existing cultural register, and then examine the resulting *cultural enrichment* that occurs when organizational actors deploy these new resources within the organization. The authors develop the notion that individuals not only draw on cultural resources directly from cultural registers at an industry level, but also that actors flexibly draw from registers from industries other than the one in which their organization is embedded. Interestingly, the authors assert that the process of cultural enrichment is likely to occur when actors are unable to combine and recombine existing cultural resources in their organization's register in ways that can adequately attend to novel situations that arise in organizational life. In this way,

Rindova et al. (2011) utilize the repertoire framework to develop the idea that cultural enrichment is a strategic process of cultural innovation led by individual members to expand the cultural resources available in their cultural register, for themselves and others within their organization to then utilize.

All in all, the open systems perspective permits the integration of repertoire and consensus perspectives of culture and emphasizes the role of individuals and organizations as being strategic agents in cultural life, while allowing for more flexibility in the source and type of cultural resource drawn upon for use in everyday organizational actions. Integrating theoretical concepts from repertoire and consensus perspectives of organizational culture, in this study I aim to assess the nature of sustainability cultural resources in an industry register, and then to measure organizations' knowledge of these sustainability conventions. In this way, I can leverage complementary theories in organizational culture that emphasize agency to investigate the extent to which organizations understand and apply particular sustainability conventions available within their industry.

A particular area in the management literature regarding organizational changes toward sustainability that would benefit from such a focus is the cultural consequences of adopting environmental certified management standards (Howard-Grenville et al., 2014). Cultural competence could play a key role in illuminating the link between how individuals understand sustainability and how they utilize these understandings in their everyday organizational actions. Thus, a key aspect of this study is to integrate concepts from culture as a repertoire and as consensus to develop theory regarding whether and how organizations' cultural competencies regarding sustainability are related to the adoption of a standardized sustainability tool developed at the supra-organizational level. Below, I provide a background on prior literature regarding environmental certified management standards, and the gap for cultural research in this area.

Certified Management Standards (CMS)

This section reviews relevant concepts from prior research regarding certified management standards, including definitions and descriptions of these programs in general.

Definitions of CMS. Certified management standards (CMS) specify sets of

internal organizational management practices across adopting firms, without constraining or specifying the nature or quality of a firm's output (Terlaak, 2007). These standards are commonly not directly linked to firm performance, nor do these standards necessarily specify how firms are required to meet the minimum level of compliance (Terlaak, 2007). CMS programs are formulated primarily by actors external to an industry, serving an unbiased "third-party" group, but often involves multiple stakeholders in the process of determining requirements and enforcement mechanisms, such as industry insiders (Balzarova & Castka, 2012; Cashore, 2002; Delmas, 2001; Henriques & Sadorsky, 2008). This third-party group also acts as certifiers, to monitor firms' compliance with the standards voluntarily adopted. As sets of standardized practices, CMS programs inhabit the 'supra-organizational' level of analysis, including the industry, societal, or even global levels.

Environmental CMS (ECMS). A subset of CMS types, environmental CMS (ECMS) programs specify a minimum set of environmental management standards with which adopting firms must comply (Terlaak, 2007; Tilley, 1999). In general, ECMS programs are designed to motivate firms to improve environmental performance, but commonly permit firms to determine how they will do so (King & Lenox, 2000). ECMS specify practices regarding environmental management in adopting firms; often termed 'voluntary regulations,' these CMS have been demonstrated to supplement regulations in counteracting opportunistic behaviors by other firms that threaten a common resource pool or shared reputation (Barnett & King, 2008; King & Lenox, 2000).

In definitional terms, "standards" are established by an authority as a rule for the measure of quantity, value, or quality of related issues, and as a model or example for desired behaviors (Merriam Webster, 2013). In this way, organizations that participate in the formulation of an ECMS hold authority to create environmental practice standards, and thus determine what serves as a model of quality regarding behaviors surrounding sustainability issues for a wider group of organizations (Delmas & Terlaak, 2001; Terlaak, 2007). When an organization adopts an ECMS, it receives a certification in exchange for agreeing to meet a minimum, and measurable, threshold of quality or value with regard to sustainability performance (Terlaak, 2007), while also legitimizing the perception that such standards do indeed accurately represent quality or value with regard

to sustainability behaviors (Delmas, 2002; Raines, 2003).

There are diverse types of ECMS programs existing in the market, ranging from industry-specific management standards, such as Forest Stewardship Council (FSC) in the forestry and paper industries, to generalized cross-sector management systems such as ISO 14001, which is an environmental management system designed to be adopted by any organization in any industry (Delmas, 2001; Delmas & Montiel, 2008; Terlaak, 2007). These ECMS programs have developed surrounding environmental management practices and systems, requiring that adopting firms comply with minimum environmental targets such as pollution emissions reduction and water conservation (Potoski & Prakash, 2005; Terlaak, 2007).

Motivations to adopt CMS. Prior studies demonstrate that there are two main motivations for firms to adopt environmental CMS: to signal to stakeholders and to erect competitive barriers.

Stakeholder signaling. First, the stakeholder-signaling model is the dominant framework within which environmental CMS adoption has been analyzed, focusing on the means through which firms can obtain positive value through communicating commitment to environmental standards to a range of diverse stakeholders (Darnall, Henriques, & Sadorsky, 2010; Masurel, 2007). Research has shown that firms often utilize the signaling aspect of the CMS, such as eco-labels – which the firm hopes will in turn increase its market share, competitive position, and ultimately profits – without incurring the costs associated with practice changes (Alberti, Caini, Calabrese, & Rossi, 2000; Rivera, 2002). In this way, prior studies suggest that many firms adopt environmental CMS primarily to create reputation-quality signaling devices in response to or in expectation of pressure from stakeholders (Barnett & King, 2008; Henriques & Sadorsky, 2008).

Scholars have developed the dominant stakeholder-signaling model of CMS adoption, in which the primary goal is to generate competitive advantage for the adopting firm by acquiring and maintaining access to key resources, both tangible and intangible (Barnett & King, 2008; King & Lenox, 2000). Compliance with the standards required by environmental CMS is commonly verified by an unbiased third party certifying agent, potentially enhancing the legitimacy of the adopting firm perceived by stakeholders

(Terlaak, 2007). As such, an environmental CMS is utilized as a communication tool by an adopting firm to protect its reputation and resources against opportunistic behavior by other firms who hold the power to affect common resources (Bansal & Clelland, 2004; Barnett & King, 2008; Terlaak, 2007). In this way, adoption mitigates concerns on the part of regulators, suppliers, activists, and other influential stakeholders who might take action against a firm perceived to be harming the environment (Masurel, 2007; Morhardt, Baird, & Freeman, 2002; Potoski & Prakash, 2005).

Competitive barriers. Second, studies have demonstrated that another primary reason why firms may adopt an environmental CMS is to erect barriers to operation for competing firms (Bansal & Hunter, 2003; Morhardt et. al., 2002). Trade associations and other industry-level organizations seek to promote collective success of firms in the associated industry, through mitigation of market and environmental risks, as well as promotion of the industry to external stakeholders who could lend support or credibility (Bansal & Hunter, 2003; Henriques & Sadorsky, 2008). There are situations in which firms may have a greater involvement in actually developing industry codes, and thus can design the codes to fit their own current practices while creating barriers for others (Masurel, 2007; Tilley, 1999). Firms of larger sizes are often members of trade association boards, and thus purportedly are influential parties in designing, implementing, and perhaps even overseeing the introduction of new industry codes or CMS (Butterfield, Reed, & Lemak, 2004; Masurel, 2007; Tilley, 1999). In this way, these firms can utilize the creation and implementation of industry-level CMS to erect barriers to competition for other firms, thus giving themselves the advantage not only in the adoption of the CMS, but also the integration of the required practices (Morhardt et. al., 2002; Potoski & Prakash, 2005; Tilley, 1999).

The gap for an open systems cultural perspective of ECMS adoption. As described above, ECMS have primarily been studied through the lenses of strategy, institutional, or stakeholder theories, focusing on how firms are perceived by competitors and influential stakeholders after adopting an ECMS (Delmas & Toffel, 2012). Looking internally, prior research has shown that often firms adopt an ECMS only symbolically, integrating only the most visible practices required by the ECMS in order to signal compliance to influential stakeholders (Darnall et. al., 2010; Howard, Nash, & Ehrenfeld,

1999; Masurel, 2007). For instance, firms are able to place an eco-label associated with the ECMS adopted on their products and marketing materials, while avoiding the costs of implementing the ECMS practices in their entirety (Rivera, 2002; Tilley, 1999). This strategy is often successful for firms because many ECMS programs are voluntary in nature and often lack stringent oversight or strict enforcement (Cashore, 2002; Potoski & Prakash, 2005; Williamson, Lynch-Wood, & Ramsay, 2006). Thus, firms that symbolically adopt ECMS aim to use the ECMS as a tool to directly increase revenue through the appeasing of stakeholder demands or as a value signal, rather than as a means through which to increase operational efficiencies (Delmas, 2001; Howard et. al., 1999; Rivera, 2002).

However, regardless of a firm's motivations to adopt an ECMS, ostensibly the decision to adopt the ECMS presumably has impacts on the firm's operations. That is, the consequences of adopting the ECMS – and more specifically, integrating the practices required by the ECMS – may interrupt an organization's 'way of doing things' and routines in general (Howard-Grenville et al., 2014). However, prior literature based on corporate codes and standards lacks definitive evidence that such integration of new practices required by an ECMS might be correlated with changes in how organizations understand and act on environmental issues. In the following sections, I describe the prior literature demonstrating links between corporate codes and employee behavior, and suggesting the potential for the adoption of ECMS practices as having an analogous relationship.

Linking standards to behaviors. Prior studies have demonstrated that corporate codes can be effective instruments for shaping employees' understandings of and behaviors related to sustainability, and suggest that corporate culture plays a role in this process (Fritz, Arnett, & Conkel, 1999; Marnburg, 2000; Stevens, 2007). For instance, in a study on the effects of corporate ethical codes on employee behavior, Stevens (2007) demonstrated that if managers model corporate ethical standards in their everyday actions and decision making, employees will be more likely to perceive the codes as "a key component of the organizational fabric" (p. 607). Findings from this study further suggest that employees that perceive their organization's ethical codes as important are more likely to engage in behaviors that comply with the standards set forth by the codes.

In a study involving large firms, Valentine & Burnett (2003) find that sales professionals employed by firms with explicit, codified ethical standards perceive their work environment to have more positive ethical values than sales professionals employed by firms without such standards. Deepening our insight beyond perceptions to action, Mangburn (2000) finds that active engagement of an organization's ethical codes is vital to behavioral changes in employees; this study demonstrates that if the codes are merely passed down in written form without management engagement, employees may perceive an organization as ethical, but will be less likely to adopt an ethical mindset in their everyday actions and decision making.

Linking culture and standardized practices. Canato, Ravasi, & Phillips (2013) engaged in research linking organizational culture and the adoption of an externally-developed set of standardized practices. The authors analyzed how 3M experienced a cultural change over time as a result of the coerced practice implementation of Six Sigma, a management philosophy emphasizing lean production and efficiency throughout organizational activities (Canato et al., 2013). The authors found that 3M organizational members partially changed their meanings and practices to align better with the standardized Six Sigma practices, instead of adapting the Six Sigma practices to fit the existing organizational culture at 3M (Canato et al, 2013). This study describes how 3M adapts to the imposition of an externally developed, standardized management tool, through the adaptation of organizational practices and mindsets by reconciling efficiency and innovation as being complementary rather than mutually exclusive (Canato et al., 2013). This study takes an open system cultural perspective by describing how an organizational culture changes and adapts with the imposition of external cultural materials, through sensemaking and sensegiving (Canato et al., 2013).

The gaps for culture and CMS adoption. These prior studies demonstrate that organizational cultural processes are influenced by the adoption of standardized practices and codes. However, such research does not address how adopted standards developed external to organizational boundaries might be related to employees' understandings of the management issues addressed by the standards or codes (Howard-Grenville et al., 2014). This means that, at a higher level, there is a distinct lack of research regarding the relationship between industry-level certified management standards and organizational

level cultural understandings, which purportedly guide organizational actions (Christmann & Taylor, 2006; Keller & Loewenstein, 2011). Important to note, there is a distinct congruence between the words 'standards' and 'conventions,' in which standards provide a template of meanings and practices that organizations can ostensibly utilize to identify and interpret meanings, and thus guide action. In this way, this dissertation asks how the adoption of an ECMS is related to changes in organizational understandings of 'how things are done around here' surrounding sustainability issues and conventions.

ECMS adoption in practice. The salience of these issues is substantiated when considering recent research demonstrating that ECMS are increasingly being adopting by firms of all sizes across a range of industries, and even at a global level (Ceres, 2010; OECD, 2008; Terlaak, 2007; Unruh & Ettenson, 2010; Waddock, Bodwell, & Graves, 2002). A recent study on the proliferation of sustainability standards states that there are currently "more than a dozen" such standards in the coffee industry, firmly guiding firm behavior in social and environmental responsibility behaviors, that have created an industry culture of standards adoption (Unruh & Ettenson, 2010). At a global level, the Global Reporting Initiative (GRI) is leading a movement to create standardized sustainability reporting metrics for organizations across industries and nations, as well as to enhance the rigor of the associated auditing procedures (Ceres, 2010; Waddock et al., 2002). As a central goal of this program, the GRI actively supports the development of integrated reporting, meaning that companies would be required to disclose both financial and sustainability performance data to investors (Ceres, 2010).

Organizations are attending to these initiatives and developments in sustainability standards and reporting expectations by regarding the adoption of voluntary industry standards as being an important strategic decision for the longevity of the organization in the market (Terlaak, 2007; Unruh & Ettenson, 2010; Waddock et al., 2002). Indeed, ECMS adoption remains an important vehicle with which to signal compliance to stakeholders, but it is also becoming a significant component in how companies are ranked or rated by the investing community (Waddock et al., 2002). Studies have demonstrated that with more criteria available to rank companies, such as best practices and sustainability performance, such criteria are becoming part of the equation used to rate companies' performance (Ceres, 2010; Waddock et al., 2002). As evidence of the

impact the proliferation of ECMS is having on strategic decision making, Unruh & Ettenson (2010) recommend that companies adopt industry standards if they fulfill two criteria: they are established (i.e., not a new venture), and lack capabilities in sustainable operations. In this way, adoption ensures that an organization maintains legitimacy by adapting to the changes in the 'way things are done' in that industry shaped by the formulation of or amendments to an ECMS (Unruh & Ettenson, 2010).

Overall, recent research suggests that although adopting voluntary codes can be a strategic move, such codes will only be respected and credible to outside parties, such as influential stakeholders, if companies actually implement the practices required by the codes (Waddock et al., 2002). In part, substantive adoption will be driven by the stringency with which standards and codes are audited and reported; substantive adoption of standards and codes will also become important to organizations that desire to maintain the legitimacy of the sustainability movement within their industry (Waddock et all, 2002). Research on the latter suggests that the proliferation of voluntary sustainability codes precludes non-adopting firms from arguing that sustainability behaviors cannot be measured, as has been done in the past, and thus the presence of ECMS in an industry raises the expectations for business engagement with social and environmental responsibility behaviors across an entire industry (Bertels & Peloza, 2008; Waddock et al., 2002). Within this lens, the lack of scholarly research regarding the implications on organizational cultural understandings of sustainability as related to ECMS adoption becomes important to address.

Summary of ECMS and moving forward. To address these gaps, I suggest that adopting an open systems perspective within the repertoire and consensus theories of organizational culture will provide a framework in which to examine how ECMS adoption is related to organizational level competencies developed surrounding sustainability conventions that guide organizational actions. In the following chapters, I describe the context in which the research questions developed above are explored, as well as the mixed methodological approach employed, the nature of the data expected to be gathered, and the analysis techniques to be utilized.

CHAPTER III

RESEARCH CONTEXT AND METHODS

In this chapter, I review the context in which I undertook this research, starting with a description of the suitability of the selected context for organizational culture research across multiple organizations and levels of analysis. I provide a background of the selected industry – the wine industry – as well as a description of the primary ECMS programs available to organizations in these areas. I then review the mixed methodological approach taken in this dissertation, drawing on a cultural consensus modeling (CCM) survey, interviews, and archival data to explore the how organizations understand and apply sustainability through both qualitative and quantitative analysis techniques.

Research Context

In this section, I present a background on the context in which this study was conducted.

Suitability of the wine industry as a context. The wine industry provides a suitable context in which to study whether and how the adoption of an ECMS is associated with how organizations understand and apply sustainability conventions in an industry for two primary reasons. First, sustainability is a key issue for vineyard firms, and as such the wine industry in the United States has experienced rapid growth and popularity of both general and industry-specific ECMS programs (Marshall, Cordano, & Silverman, 2005; Cordano, Marshall, & Silverman, 2010). Second, this growth and popularity of ECMS adoption has varied widely between regional wine industries in the US (Robinson, 2006). Providing methodological rigor, such regions are clearly identifiable, as regional wine industries are demarcated by American Viticulture Areas (AVAs) (Robinson, 2006). I discuss these issues in more detail in the following sections.

Popularity of ECMS in the wine industry. At its core, the foundations of the wine industry are agricultural; dependent on the longevity and quality of agricultural resources, climate change issues have become central to wine and grape producers (Resco, Quiroga, Iglesias, & Sotes, 2010). For example, recent research into the impact on viticulture practices of climate change in Spain shows that:

> Mediterranean may experience substantial drying (precipitation reductions of more than 25%) and warming (temperature increases of 3-5%) by 2080 … [which] will have consequences for the availability of water resources, pests and diseases and soils, leading to significant changes in the conditions for agriculture (Resco et al., 2010, p. 2)

For some vineyard firms, one strategy to mitigate sustainability issues is to adopt an ECMS, choosing among general CMS such as ISO 14001 or organic certification, or industry-specific certification programs (Cordano et al., 2010; Robinson, 2006). In general, the goal of vineyards in adopting an ECMS is to achieve *sustainable viticulture*, defined as "a form of viticultural practice which aims to avoid any form of environmental degradation while maintaining economic viability" (Robinson, 2006, p. 670). ECMS are often perceived by vineyard firms as providing best practices surrounding sustainable viticulture, with many regional industry trade associations promoting such standards as advancing both environmental and economic benefit to adopting vineyards through the provision of model behaviors (Marshall et al., 2005; Robinson, 2006).

However, the rates of ECMS adoption have widely varied among regional industries, with some regions witnessing high rates of adoption by vineyard firms, and others experiencing almost zero growth in ECMS adoption (Cordano et al., 2010; Robinson, 2006). Research has demonstrated that these differences stem from a number of reasons, including differences in the perception of the urgency and scale of sustainability issues in the wine industry, and the high cost of ECMS adoption (Cordano et al., 2010; Delmas & Grant, 2008). Regarding the latter, many firms in the wine industry are small in size and production, thus the cost of the ECMS may outweigh the perceived benefits for these firms (Cordano et al., 2010). Aforementioned, prior research supports this reason, as studies have shown that large firms can more readily adopt ECMS due to a greater supply of slack resources (Masurel, 2007; Tilley, 1999). Regarding the first reason, there is evidence that eco-labeling – demonstrated to often serve as a primary motivation to adopt an ECMS (Rivera, 2002; Tilley, 1999) – actually holds a negative perception by some consumers of wine (Delmas & Grant, 2008). Thus, an ECMS may not be perceived as a wise investment for vineyards whose primary motivation to adopt is to display an eco-label on their products (Delmas & Grant, 2008). I discuss this second reason for varied ECMS adoption in the wine industry below.

Perception of eco-labeling in the wine industry. Counter to the positive image of mainstream organic food labeling, there is evidence that consumers have a negative connotation of organic wine or eco-labeling (Delmas & Grant, 2008; Mann, Ferjani, & Reissig, 2012), meaning that grape and wine producers have few market-based incentives to become more sustainable in their operations. Perhaps evidence of this lack of ready consumers for organic wine is the variance in the rate of adoption of ECMS by vineyards in different regions within the greater global industry (Atkin, Gilinsky, & Newton, 2011; Bekkers, 2011; Resco et. al., 2010). Even though wine producers produce similar products and market to similar customers, in some regions, existing and new firms alike are proactively integrating pro-social and pro-environmental priorities into their for-profit business models for upstream reasons, whereas in others these activities are still nascent (Bekkers, 2011; Bouzdine-Chameeva & Krzywoszynska, 2011; Marshall et. al., 2005).

Instead, grape and wine producers with sustainable business practices demonstrate predominantly market-driving behaviors in movements toward sustainability through the creation of new standards and ways of doing business that are diffusing outward (Atkin et. al., 2011; Marshall, Akoorie, Hamann, & Sinha, 2010). In the end, however, being inherently dependent on natural resources, recent research demonstrates that the adoption of sustainable viticulture practices by grape and wine producers may become vital to the continuing operations of their business, regardless of consumer demand, and that ECMS may be effective tools in accomplishing this task (Atkin et. al., 2011; Marshall et al., 2005; Resco et. al., 2010)

Geographical boundaries of regional wine industries in U.S. The second reason the wine industry is a suitable context for comparative research is that the U.S. wine industry has clearly defined boundaries of regional industries demarcated by American Viticulture Areas (AVAs). AVAs are federally designated grape-growing regions approved by the Alcohol and Tobacco Tax and Trade Bureau (TTB), and governed by the individual state in which the region is located (Robinson, 2006). The fact that AVAs are located within state lines and governed at the state level permits the delineation of regional industries defined by the state (Robinson, 2006). In the wine industry, regional industries in the U.S. are referred to by the state name, with the top five wine producing regional industries being California, Washington, Oregon, New York, and Virginia

(Robinson, 2006). A regional industry defined by state name is composed of the collection of all AVAs in that state (Robinson, 2006).

Furthermore, geographical location of a vineyard holds implications for the viticulture practices employed, as well as particular aspects of sustainable viticulture that have a greater impact (Dougherty, 2012). In the wine industry, vineyard management practices vary from firm to firm primarily according to factors that impact the cultivation of grape crops, called *terroir*, which include topography, climate, sun exposure, rainfall, and soil types of the particular location in which the grape crops are grown (Dougherty, 2012; Robinson, 2006). As *terroir* varies from location to location, and sustainability issues also vary from location to location, thereby potentially requiring different behaviors related to sustainability in vineyard firms located in different regional industries (Marshall et al., 2005; Resco et al., 2010). For example, regarding the implications of obtaining balanced information about sustainability practices, vineyard firms operating in warmer, drier climates may experience greater issues with water conservation than vineyards operating in cooler, wetter climates (Resco et al., 2010). From a theoretical perspective, these differences in how vineyards located in different regional industries attend to sustainability enhance the potential for variance to emerge in how vineyards understand and act on sustainability.

Background on the Pacific Northwest wine industry. I chose the regional wine industries of the states of Oregon and Washington as the research contexts for this dissertation primarily because these two regions are of comparable age, size, and composition, but have experienced differing histories regarding ECMS adoption (Kolpan, Smith, & Weiss, 2010; Robinson, 2006). Of these two state industries, Oregon vineyards are leaders in ECMS adoption, while Washington vineyards lag behind. I now provide a brief overview of the composition and history of these two regional wine industries.

Oregon wine industry. The wine industry in the state of Oregon has grown rapidly from its beginnings in the early 1960s (Kolpan et al., 2010). Two decades after forming, there were approximately 180 vineyards, totaling approximately 1,800 acres of grapes grown in 1982; as of 2012, there were over 400 vineyards, totaling approximately 44,000 acres of grapes grown (Kolpan et al., 2010; OWA, 2013; OWB, 2013). On average the vineyard firms in Oregon are small in size, producing between 2,500 and

20,000 cases of wine annually (Robinson, 2006). The most widely planted grape varietal is Pinot Noir, with 96% of wine produced in Oregon being sold domestically in the U.S., and 19% of those sales occurring within the state of Oregon. Oregon is now the third-largest wine producing state in the U.S., after California in first place and Washington in second (Robinson, 2006).

Even though it is small relative to the California wine industry, which produces 90% of the U.S.-grown wine (Robinson, 2006), the Oregon wine industry is gaining in notoriety and importance both internally and externally to the state of Oregon. Within Oregon, the wine industry is increasingly viewed as being an important contributor to the state's economy, with the total economic impact in 2010 being $2.7 billion, which is an increase of 93% from $1.4 billion in 2005 (FGR, 2011). Recent studies have established Oregon's wine-grape crop as the top "value-added agricultural segment" in the state, showing that wine grapes also are emerging as one of the state's more stable crops, particularly when compared to commodity products such as grass seed and nursery products (FGR, 2011).

Furthermore, at a national and global level, Oregon wines are achieving success in the media and award competitions worldwide, particularly gaining notoriety for wines made with the Pinot Noir grape varietal (Kolpan et al., 2010; Robinson, 2006). The Pinot Noir varietal is considered to be a high-quality grape that produces wines with depth and complexity, which are qualities of great value among wine consumers; thus wines produced in Oregon often sell at higher prices relative to wines produced in other regions in the U.S. (Robinson, 2006). Furthermore, the Oregon wine industry is emerging in the global wine industry as a leader in sustainable viticulture, with approximately 38% of all vineyard firms in the state having adopted some form of ECMS (Kolpan et al., 2010; OWB, 2013). Thus, all in all, the Oregon wine industry is emerging as a key economic contributor to the state economy, leader of the state's agricultural sector, and exemplar of sustainable viticulture to the wine regions worldwide.

Washington wine industry. The modern wine industry in Washington took roots in the late 1960s, growing rapidly from its beginnings at only a handful of vineyards in 1969 to more than 163 by 2000 (Robinson, 2006). Currently, as of 2012, there are approximately 300 vineyards, totaling approximately 43,000 acres of wine grapes grown

(WAWGG, 2013). Like Oregon, vineyard property in Washington is primarily owned and managed by small firms; however, a major difference between these two regional industries is that in Washington a high percentage of the total wine is produced by a few large firms. In fact, the five largest wine producers represent more than 70% of wine production, but operate only 30% of vineyard lands; whereas several hundred small vineyard firms producing only approximately 30% of wine produced in Washington represent 70% of vineyard lands (Robinson, 2006; Stonebridge, 2012). The most widely planted grape varietals in Washington are Cabernet Sauvignon, Merlot, Sauvignon Blanc, and Riesling (Kolpan et al., 2010), with approximately 50 brands of wine produced in Washington being distributed at a national level in the U.S., and 35% of Washington wine sales occurring within the state of Washington (Stonebridge, 2012). Washington now produces 20.1 million gallons of wine annually, which comes a far second to California's first place at over 500 million gallons of wine produced annually (Kolpan et al., 2010).

Like Oregon, the Washington wine industry is smaller in size and production than California, but it is gaining in importance to the agricultural sector and state economy of Washington. Also as with Oregon, the wine industry in Washington is increasingly viewed as being an important contributor to the state's economy, with the total economic impact in 2012 being almost $8.6 billion, which is an increase of approximately 185% from $3 billion in 2006 (MKF, 2006; Stonebridge, 2012). Employment figures further demonstrate that the Washington wine industry is growing in economic importance to the state by employing 3,630 full-time equivalent jobs in 2012, which is a 45% increase from 2,500 in 2006 (MKF, 2006; Stonebridge, 2012).

At a national and global level, Washington wines can be considered on par with Oregon wines in awards and notoriety; overall, Washington wines are increasingly categorized as premium wines (Robinson, 2006). However, the Washington wine industry lags slightly behind the Oregon wine industry in sustainable viticulture, although this topic has been receiving increasing attention in the past few years (WAWGG, 2013). Thus, all in all, the Washington wine industry is emerging as a key economic contributor to the state economy, but lags behind the Oregon wine industry in sustainable viticulture.

Primary ECMS in the wine industries of Oregon and Washington. There are three main categories of ECMS available in the regional wine industries of Oregon and Washington: biodynamic, organic, and sustainability (Robinson, 2006; OWB, 2013). All three ECMS categories reside at either the industry or global levels.

Biodynamic certification. The most rigorous of certifications to obtain, Demeter Biodynamic is the only biodynamic certifier in the U.S. This U.S.-based non-profit organization operates internationally, providing "the legal definition of biodynamic in the marketplace"[1]:

> In order for a farm to refer to itself as Biodynamic, it must have achieved certification through Demeter by adhering to the *Demeter Farm Standard* for a minimum of three years if conventionally farmed, or a minimum of one year if organically farmed. The entire farm must be certified, not just a portion of land within the farm. … In practice, Biodynamic farming meets the organic standard including the prohibition of synthetic chemical fertilizers, pesticides, herbicides and fungicides, but then it goes much further (Demeter, 2013)

Dating from 1928, the biodynamic system is one of the oldest formalized certification programs of the three possible in Oregon and Washington, and is internationally recognized. To maintain biodynamic status, vineyards and wineries must pay an annual membership fee, along with hourly rates and travel expenses of audit inspectors. Though unable to determine exact costs involved, it was reported through interviews with certification agents and vineyard managers that the Demeter Biodynamic program is "by far" the most costly of the three potential certification categories.

Organic certification. Below the biodynamic certification on the rigor and cost scales is the organic certification. In the U.S., the organic labeling program is overseen by the federal government through the United States Department of Agriculture (USDA):

> Organic is a labeling term that indicates that the food or other agricultural product has been produced through approved methods that integrate cultural, biological, and mechanical practices that foster cycling of resources, promote ecological balance, and conserve biodiversity. Synthetic fertilizers, sewage sludge, irradiation, and genetic engineering may not be used (USDA, 2013)

An organic certification process is overseen by the USDA National Organic Program (NOP), which has over 90 associated certification agencies qualified to confer

[1] All information on Demeter Biodynamic sourced from website: http://www.demeter-usa.org/for-farmers/certification.asp

certifications and conduct audits (USDA, 2013). Annual fees associated with an organic certification are a minimum of $400, which includes membership dues and an hourly rate paid to the audit inspectors (four hours minimum), plus travel costs of the audit inspectors[2]. It was reported in interviews that these fees generally increase with the size of the vineyard or winery as more time is required of the inspector to examine the facilities.

Sustainability certification. The third certification category includes the sustainability certification of Low Impact Viticulture and Enology (LIVE), which is an Oregon-based non-profit specifically targeted toward the regional wine industry of the Pacific Northwest. In interviews with certification agents and vineyard managers, a sustainability certification is considered the least rigorous and least costly of the three certification categories available in Oregon and Washington. However, adding to their attractiveness to vineyard owners and managers is the fact that all three sustainability certifications collaborate with each other to varying extents, promoting the adoption of the other certifications along with their own through marketing and fee-reduction incentives. Indeed, sustainability certifications have proliferated throughout Oregon and California, and are now becoming more popular in Washington state as well (Robinson, 2006). I provide more detail on the primary sustainability certification available in the Oregon wine industry: Low Input Enology and Viticulture (LIVE).

Low Input Viticulture and Enology (LIVE). One of the most popular certifications in the Oregon wine industry, LIVE was developed in Oregon and has primarily targeted vineyards and wineries in the Pacific Northwest, and has experienced rapid success and substantial growth in these states since its formation in 1999[3]. LIVE was first introduced to Oregon vineyards and wineries in 1999, and only made available to Washington wine growers in 2006. LIVE management states that they have no plans to expand beyond the Pacific Northwest due to the intensive manner in which the standards are created. LIVE involves multiple stakeholders in the formulation of standards, primarily including viticulture researchers from Oregon State University

[2] All information obtained from Oregon Department of Agriculture website: http://cms.oregon.egov.com/ODA/cid/Pages/organic.aspx

[3] All information obtained from LIVE website: http://liveinc.org/ and interviews with certification agents and vineyard managers.

(OSU), LIVE management, and vineyard managers at vineyard firms who serve as board members for LIVE. As such, the process to set the standards is complex and costly, requiring multiple iterations between vineyard managers and researchers to formulate detailed, tailored standardized practices for the growing climates of the Pacific Northwest region, as well as to provide regular education seminars that provide the latest in sustainable viticulture led by OSU researchers. Currently, LIVE has developed to include two primary sets of standards: one set for cool, wet growing conditions closer to the Pacific coast (Region I), and one set for hot, dry growing conditions of inland regions (Region II); according to certification agents, expanding beyond these two regions to other growing-region types threatens to weaken the strong standard formulation and certification program LIVE offers currently.

Generally, LIVE requires certified vineyards to integrate practices that promote sustainable agriculture and stewardship to the natural environment:

> LIVE aims to preserve human and natural resources in the wine industry of the Pacific Northwest. We accomplish this through internationally-recognized third-party certification of collaborative science-based winegrowing standards (LIVE 2013)

The LIVE certification is modeled on the International Organization for Biological Control (IOBC), tailoring its basic standards to the needs of the wine regions in Oregon and Washington. LIVE requires a one-time $100 application fee and then $175 annually to renew membership, plus a $350 inspection fee every two to three years. To facilitate effective integration of standardized practices, vineyards that adopt LIVE are provided with detailed guidelines for all practices required by the certification, as well as the option to attend educational seminars led by viticulture researchers as described above.

Impact of ECMS in the Pacific Northwest wine industries. Overall, Oregon has many more vineyards than Washington holding at least one of the types of the three available ECMS. First, LIVE has enjoyed great success in the Oregon wine industry, with 102 Oregon vineyard firms (representing 7,062 vineyard acres) having adopted LIVE standards as of June 2013; as of this same date, there were only 20 vineyards certified by LIVE in the Washington wine industry (representing 2,004 vineyard acres)[4].

[4] Total numbers of LIVE certified vineyard firms obtained from LIVE website: http://liveinc.org/certified_members/vineyards

Second, organic certifications have found similar success in Oregon and Washington, with 17 vineyard firms in Oregon and 14 vineyard firms in Washington being certified organic as of 2013[5]. Third, biodynamic certifications have been the most successful in Washington, with 13 biodynamic certified vineyard firms in Washington as of 2013[6]; there were 12 vineyard firms in Oregon being certified biodynamic as of 2012. In sum, as of June 2013, there were a total of 131 environmental certifications granted to vineyard firms in Oregon, compared to only 37 in Washington. See Table 1 for the distribution of vineyard firms and certifications in Oregon and Washington AVAs.

Methodological Approach

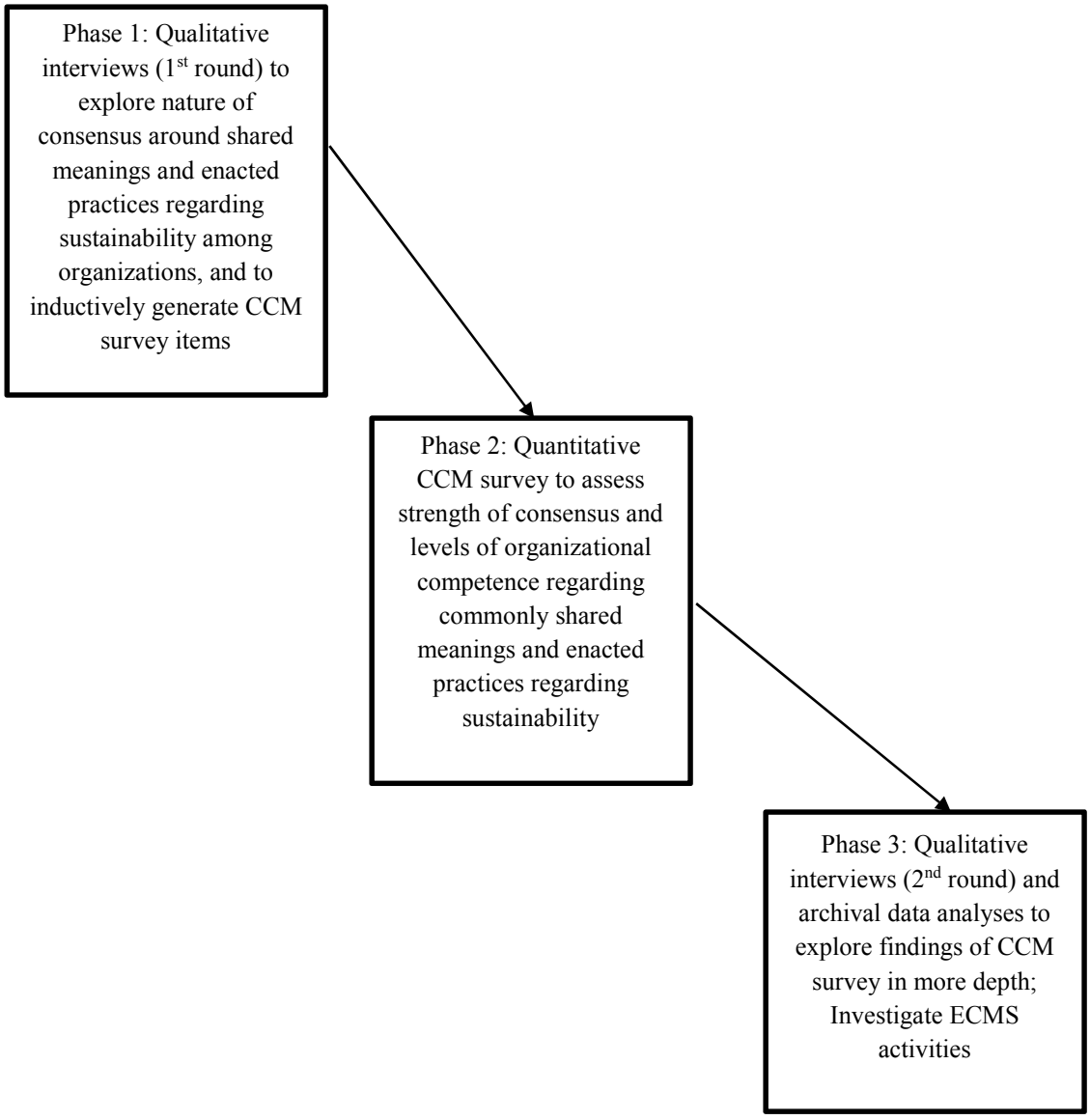
The theoretical question I investigate in this dissertation is how organizations understand sustainability cultural resources shared at a supra-organizational level. I operationalize this question by examining whether and how the adoption of an ECMS is related to organizations' cultural competencies developed surrounding sustainability conventions that guide organizational actions within and between two regional wine industries. In this dissertation, I utilize *cultural consensus modeling* (CCM), which is an analysis tool combining qualitative and quantitative methodologies, to analyze patterns underlying similarities and differences in cultural competencies regarding sustainability conventions as held by vineyard firms in the Oregon and Washington wine industries, focusing on how ECMS adoption is related to such competencies (Weller, 2007).

To lay the groundwork for the phased, mixed methodological approach to be taken in this dissertation, in this chapter I provide a brief overview of the CCM process as it requires a particular ordering of the qualitative and quantitative methodological approaches; I provide a more detailed description of CCM analysis later in the document. I also describe my plan for operationalizing the key construct of organizational cultural competence in a CCM survey, as well as explicate the level of analysis at which the research was conducted. Figure 1 summarizes each of the phases in this research.

[5] Total numbers of organic certified vineyard firms obtained from U.S. Department of Agriculture, National Organic Program website: http://www.ams.usda.gov/AMSv1.0/nop

[6] Total numbers of biodynamic certified vineyard firms obtained from Demeter Biodynamic website: http://www.demeter-usa.org/downloads/Demeter-Winery-Vineyard-List.pdf

Figure 1: Three Phases of Inductive Research



Units and levels of analysis. In this dissertation, I use the organization as the unit of analysis and the industry as the level of analysis. Motivated by the recent theoretical developments in organizational culture, there is promise for understanding cultural processes that occur at a supra-organizational level (Weber & Dacin, 2011). At the level of the industry, these supra-organizational cultural processes ostensibly involve multiple organizations that flexibly engage cultural resources from a shared industry register (Weber, 2005). As demonstrated by Weber (2005), an industry register is the "entirety of cultural material at the disposal of individual actors or collectives" (p.228), in which definition organizations can be defined as a collective. Weber (2005) also demonstrated that cultural processes that occur at the supra-organizational level of the industry register "likely play a role in organizations' cultural competence … via mechanisms of requisite variety, skill and situational adaptativeness" (p. 229).

In this dissertation, I adopt Weber's (2005) perspective that organizations are collectives that can develop cultural competencies regarding cultural conventions, or cultural resources in an industry register. In this way, I utilize the organization as the unit of analysis, and utilize the sustainability cultural resources within the cultural registers of the Oregon and Washington wine industries as the level of analysis. Thus, in this dissertation, I measure the organizational levels of competencies regarding sustainability cultural resources, or conventions, available to vineyard firms in Oregon and Washington, with methods to be described in the following section.

In order to capture organizational level cultural competencies across the Oregon and Washington wine industries, I interviewed and surveyed several vineyard managers as representatives for their organizations. There are a few reasons why I could employ the assumption that organization-level cultural competencies regarding sustainability cultural materials in the industry register can be approximated by the responses of individual vineyard managers. First, I adopt prior management theory stating that managers are key decision makers for firms (Simon, 1977) to state the assumption that vineyard managers are key decision makers in vineyard firms. Second, recent theoretical developments in organizational culture research regarding open systems cultural processes have demonstrated that often there are key individuals within organizations that

Table 1: Distribution of Vineyard Firms and Certifications by State and AVA

Count	State	AVA	# Vineyard firms	% of total in state	# Certified vineyards	% Certified
1	OR	Applegate Valley AVA	16	3.7%	2	12.5%
2	OR	Chehalem Mountains AVA	72	16.8%	23	31.9%
3	OR	Columbia Gorge AVA	19	4.4%	1	5.3%
4	OR	Dundee Hills AVA	37	8.6%	17	45.9%
5	OR	Eola-Amity Hills AVA	76	17.7%	24	31.6%
6	OR	Elkton Oregon AVA	1	0.2%	0	0.0%
7	OR	McMinnville AVA	13	3.0%	2	15.4%
8	OR	Non-AVA	2	0.5%	0	0.0%
9	OR	Ribbon Ridge AVA	3	0.7%	1	33.3%
10	OR	Rogue Valley AVA	19	4.4%	2	10.5%
11	OR	Southern Oregon AVA	6	1.4%	0	0.0%
12	OR	Umpqua Valley AVA	24	5.6%	3	12.5%
13	OR	Willamette Valley AVA	83	19.3%	24	28.9%
14	OR	Yamhill-Carlton AVA	58	13.5%	17	29.3%
		Totals	**429**	**100.0%**	**--**	**--**
1	WA	Ancient Lakes of Columbia Valley AVA	6	2.0%	0	--
2	WA	Columbia Gorge AVA	20	6.8%	3	15.0%
3	WA	Columbia Valley AVA	13	4.4%	4	30.8%
4	WA	Horse Heaven Hills AVA	14	4.8%	3	21.4%
5	WA	Lake Chelan AVA	20	6.8%	1	5.0%
6	WA	Naches Heights AVA	3	1.0%	3	100.0%
7	WA	Puget Sound AVA	28	9.6%	0	--
8	WA	Rattlesnake Hills AVA	15	5.1%	1	6.7%
9	WA	Red Mountain AVA	29	9.9%	3	10.3%
10	WA	Snipes Mountain AVA	4	1.4%	0	--
11	WA	Wahluke Slope AVA	8	2.7%	1	12.5%
12	WA	Walla Walla Valley AVA	78	26.6%	13	16.7%
13	WA	Yakima Valley AVA	52	17.7%	4	7.7%
14	WA	Other	3	1.0%	0	--
		Totals	**293**	**100.0%**	**--**	**--**

are responsible for the interchange of cultural resources across organizational boundaries (Harrison & Corley, 2011). As managers are often key decision makers who serve as liaisons between a firm and its environment (Simon, 1977), ostensibly such managers are

likely candidates to fill the role of a 'cultural ambassador' by engaging in cultural cultivation (Harrison & Corley, 2011). Finally, theoretical ideas of managers serving as key decision makers and cultural ambassadors are bolstered by the demographics of the Oregon and Washington wine industries, which are primarily composed of small firms (Robinson, 2006). Thus, indeed, in practice vineyard managers are often the key decision maker regarding sustainable viticulture practices in a firm with five to ten employees. Therefore, for all of these reasons, I assume that the cultural competencies of a vineyard manager represent the organization-level cultural competencies of the vineyard firm to which they belong.

Cultural consensus modeling (CCM). According to a CCM approach, I first qualitatively identified sustainability cultural conventions within the registers of the regional wine industries of Oregon and Washington, and then used a survey to quantitatively assess the levels of competencies regarding those conventions as held by organizations located in these regions (Bernard, 2006; Weller, 2007). As a first step in CCM, I conducted qualitative interviews to establish how vineyard managers in the two regions understand industry-level sustainability conventions, and then how they utilize these understandings in their own vineyard practices, as well as how they perceive other vineyard organizations in their regions to understand and act on sustainability (Weller, 2007). I review the findings from the preliminary interview data collected in a later section.

I then developed, piloted, and deployed a CCM survey across vineyard firms in Oregon and Washington. I utilized the qualitative information gathered in the first phase to build a survey instrument intended to measure organizations' cultural competencies regarding widely held sustainability cultural conventions (Weller, 2007). Cultural competencies are measured by vineyard managers' levels of agreement or disagreement with items on the survey questionnaire that describe sustainable viticulture conventions reported as being expected or appropriate across the Oregon and Washington regional wine industries (Keller & Loewenstein, 2011). Then, as part of the consensus analyses, I used exploratory factor analysis (EFA) with the survey data to assess patterns of shared characteristics underlying groupings of organizations with shared levels of cultural competencies, focusing on how ECMS adoption fits the emergent patterns of cultural

competencies (Weller, 2007). These groupings of organizations were located across regions, containing organizations from both Oregon and Washington.

I undertook a second round of qualitative interviewing to further investigate the nature of the relationships described by the quantitative survey analyses in the second phase of empirical research. To this end, I interviewed survey respondents who had either low or high cultural competencies to better understand whether and how ECMS adoption is related to the development of organizations' understandings of widely held sustainability conventions that, in turn, guide organizational actions. I also conducted an analysis of archival data relating to the ECMS that the survey results indicated to have high cultural consensus and competency scores regarding sustainability among adopting organizations - LIVE. I explain each of these phases of research in more detail in following sections; first I describe the key theoretical constructs to be measured in a CCM survey.

Operationalization of key constructs. In this section, I discuss my plan for operationalizing both sustainability cultural resources as widely held meanings, or conventions, and organizational cultural competencies as knowledge in a CCM survey.

Operationalization of sustainability cultural resources. In order to identify and operationalize sustainability cultural resources in this dissertation, I draw on concepts from the repertoire and consensus perspectives of organizational culture. The repertoire perspective views culture as being composed of cultural resources that are combined and recombined into strategies of action by organizations (Swidler, 1986). Recall that cultural resources are conceived as being rituals, stories, role figures, language, meanings, and practices particular to an organization (Swidler, 1986; Weber, 2005). At a macro level, these cultural resources reside in the cultural register of the industry, which is conceptualized to be the set of all cultural resources available to organizations in a shared industry; from this industry register, organizations can draw resources to construct strategies of action in response to everyday organizational situations (Weber, 2005). Drawing on these concepts, I define *sustainability cultural resources* as meanings and practices surrounding sustainability issues perceived as commonplace in the interview subject's regional industry. Integrating concepts from the consensus perspective of culture, widely held meanings are termed 'conventions,' and thus this dissertation

operationalizes sustainability cultural resources as sets of conventions that guide action. In this way, sustainability conventions are operationalized by reported managerial meanings regarding what does and does not constitute sustainable viticulture practices in the Oregon and Washington wine industries.

Operationalization of cultural competence. *Organizational cultural competence* is defined as the organizational level of knowledge regarding cultural resources contained in the cultural register of the industry in which the organization is embedded (Romney et al., 1986). Aforementioned, prior research has shown that individuals and collectives embedded in different cultures can differently interpret shared or similar cultural components, basing their interpretations of actions on the shared understandings of the culture to which they belong (Atran et al., 2005; Bernard, 2006; Keller & Loewenstein, 2011). This means that organizations can develop varying levels of cultural competencies regarding the same cultural resources.

In the CCM survey, I operationalized cultural competence by measuring organizations' agreement or disagreement with the congruence of a list of scenarios that describe varying degrees of adherence to the reported conventions surrounding sustainable viticulture practices in their regional industry (Keller & Loewenstein, 2011). I utilized the responses of vineyard managers to the CCM survey as proxies for organizational level responses, and further assume that their responses to the survey items appropriately represent the level of cultural competencies of the organizations to which they belong. Data from the survey thus provided information regarding groupings of organizations with similar levels of cultural competencies (Weller, 2007). These covariances in shared understandings were quantified and then analyzed as to whether and how competencies related to sustainability conventions are shared by organizations within and across regional industries, as well as the nature of the associations these competencies may have with ECMS adoption.

Research design: Mixed methods design. The empirical research for this dissertation was conducted in three phases: first qualitative, second quantitative, and then third again qualitative. In this section, I review the methods utilized in these empirical phases in more detail.

Method & data: Qualitative inquiry to build the CCM survey. In this section, I explain the method by which I collected and analyzed the qualitative data I utilized to build a CCM survey. I sought to broadly investigate sustainable viticulture conventions reported by vineyard managers in the Oregon and Washington wine industries. I used content analysis techniques to delineate conventions surrounding what does and does not constitute sustainable viticulture practices. In this way, the sustainable viticulture conventions identified in this first qualitative phase of research are informing the construction of scenarios used as items in the CCM survey intended to measure organizational cultural competencies regarding industry-level sustainable viticulture conventions. Note, I obtained approval for all empirical data collection for this dissertation from the International Review Board (IRB) with Research Compliance Services at the University of Oregon; the exempt status approval documents are included in Appendices A, B, C, and D.

Methods: First round of qualitative interviews. I conducted 25 semi-structured, in-depth interviews over the period of three months with selected vineyard managers from each region: Oregon and Washington. I conducted 10 interviews with Oregon vineyards with ECMS; 5 interviews with Oregon vineyards without ECMS; 2 interviews with Washington vineyards with ECMS; and 9 interviews with Washington vineyards without ECMS. These interviews were with vineyard managers with the aim to identify sustainable viticulture conventions in their regional industry. These interviews took place over the telephone, and were recorded and transcribed, having obtained informed consent from each informant before starting the interview (Miles & Huberman, 1994).

Interview sampling methods. To select interview participants for the first round of interviews, I utilized a sampling technique approximating quota sampling, meaning that I chose subpopulations of interest with sets of desired characteristics (Bernard, 2006). I chose quota sampling because my aim for the interviews was to accurately assess widely held sustainable viticulture conventions by organizations in the Oregon and Washington wine industries, and thus I sought to ensure that I obtained a representative sample of vineyard firms from the sample frame.

Interviews: Sample frame. The target population for the empirical research was all of the vineyard firms in the states of Oregon and Washington; thus the interviewing

sample frame took into account the potential differences in vineyard management practices between AVAs to accurately represent the target population (Singleton & Straits, 2009). A sample frame is defined as a list of subjects from which a researcher generates a sample to include in their study as well as to which a researcher generalizes their study results, and thus is composed of the group of vineyard firms chosen for potential interviews (Bernard, 2006; Singleton & Straits, 2009). Interviewing vineyard firms from only a few AVAs – or more importantly with the same certification statuses – would generate biased results used to inform the CCM survey. Thus, I ensured that the sample frame included vineyard firms from across each AVA in each state with varying certification statuses (Singleton & Straits, 2009).

As such, I identified all of the AVAs and wine regions in Oregon and Washington, finding that there are thirteen AVAs and regions in Oregon, and thirteen AVAs and regions in Washington. Next, I selected one to ten vineyard firms from each AVA or region with varying certification statuses in order to ensure a balanced sample frame. Note that some AVAs or regions are more populated than others, or have more diversity in certification statuses, so there were more potential subjects from these regions in the sample frame. This means that the sample frame included a balanced selection of vineyard firms with biodynamic, organic, LIVE, or no certification from each AVA in Oregon and Washington. This composition of potential interview subject ensured that there was variance in how vineyard managers described their understanding of sustainability conventions in their regional industries, thus providing qualitative data that is representative of the cultures surrounding sustainability in the Oregon and Washington wine industries (Singleton & Straits, 2009). This step resulted in a sample frame of 104 vineyards; see Table 2 for the distribution of vineyard firms by AVA and certification status included in the sample frame.

Interviews: Selected samples. Prior CCM studies have utilized a minimum of 15 interviews to inform the development of a CCM survey (Keller & Loewenstein, 2011) Thus, my goal was to conduct between 20 and 30 interviews to inform the development of the CCM survey questionnaire. To select these interviews participants, I generated a selected sample of vineyard firms chosen for interviewing from the sample frame (Singleton & Straits, 2009). My method for selecting vineyard firms as potential

interview subjects from the sample frame – while maintaining the desired balances of regional and certification statuses – was to choose one to two vineyard firms from each AVA. This step resulted in generating a selected sample from Oregon of 34 potential interview subjects, and a selected sample from Washington of 24 potential interview subjects; see Table 3 for the distribution of vineyard firms by AVA and certification status included in the selected samples for the first round of interviews.

Interviews: Collected samples. To request the interviews, I sent email requests to each of the vineyard firms in the selected samples. For each vineyard firm that declined or did respond, I contacted another vineyard firm in that same AVA included in the selected samples; I repeated this step until I obtained consent from the minimum number of interviews desired. At this stage, I conducted 25 interviews.

Data: First round of qualitative interviews. In order to inform the construction of scenarios used in items intended to measure cultural competence, I needed to be able to delineate a list of the key sustainable viticulture conventions engaged in by organizations across the two regions (Weller, 2007); that is, I needed a list of those viticulture practices that are reported as being sustainable by a wide range of vineyard managers in Oregon and Washington. These examples include sustainability conventions that informants have engaged in themselves, or conventions that they have observed their peers engage in on a regular basis. I also needed to consider that informants might be aware of certain conventions that they have not engaged in or observed being implemented. Thus, to accurately delineate sustainable viticulture conventions, I needed to also obtain examples of any sustainable viticulture practices that informants would agree upon as being appropriate or expected in their regional industry, regardless of their experience with those practices. For instance, in interviews, I asked informants about the types of practices that vineyard managers in their regional industry would deem 'sustainable,' as well as examples of those practices vineyard managers would deem 'unsustainable'; I then prompted them to explain their choices. In sum, the examples of sustainable viticulture conventions obtained are informing the construction of scenarios as items in the survey to compose the cultural competency scale. Figure 2 lists questions used in this qualitative first phase of empirical research.

Table 2: List of Vineyard Firms Included in Sample Frame for First Round Interviews

Count	State	AVA/Location	Certifications
1	OR	Applegate Valley AVA	LIVE
2	OR	Applegate Valley AVA	LIVE
3	OR	Applegate Valley AVA	None
4	OR	Applegate Valley AVA	None
5	OR	Applegate Valley AVA	Organic, Biodynamic
6	OR	Chehalem Mountains AVA	Biodynamic
7	OR	Chehalem Mountains AVA	Biodynamic
8	OR	Chehalem Mountains AVA	LIVE
9	OR	Chehalem Mountains AVA	LIVE
10	OR	Chehalem Mountains AVA	LIVE
11	OR	Chehalem Mountains AVA	Organic, Biodynamic
12	OR	Chehalem Mountains AVA	Organic, Biodynamic
13	OR	Chehalem Mountains AVA	None
14	OR	Chehalem Mountains AVA	None
15	OR	Columbia Gorge AVA	Organic
16	OR	Columbia Gorge AVA	None
17	OR	Columbia Gorge AVA	None
18	OR	Dundee Hills AVA	LIVE
19	OR	Dundee Hills AVA	LIVE
20	OR	Dundee Hills AVA	LIVE
21	OR	Dundee Hills AVA	LIVE, Biodynamic
22	OR	Dundee Hills AVA	Organic
23	OR	Dundee Hills AVA	Organic
24	OR	Dundee Hills AVA	None
25	OR	Dundee Hills AVA	None
26	OR	Eola-Amity Hills AVA	LIVE
27	OR	Eola-Amity Hills AVA	LIVE
28	OR	Eola-Amity Hills AVA	LIVE
29	OR	Eola-Amity Hills AVA	LIVE, Organic
30	OR	Eola-Amity Hills AVA	LIVE, Organic, Biodynamic
31	OR	Eola-Amity Hills AVA	None
32	OR	Eola-Amity Hills AVA	Organic
33	OR	Eola-Amity Hills AVA	Organic
34	OR	Eola-Amity Hills AVA	None
35	OR	McMinnville AVA	LIVE
36	OR	McMinnville AVA	None
37	OR	McMinnville AVA	None
38	OR	McMinnville AVA	Biodynamic
39	OR	Ribbon Ridge AVA	Organic, Biodynamic

40	OR	Ribbon Ridge AVA	None
41	OR	Rogue Valley AVA	LIVE
42	OR	Rogue Valley AVA	Organic
43	OR	Rogue Valley AVA	None
44	OR	Rogue Valley AVA	None
45	OR	Southern Oregon AVA	None
46	OR	Umpqua Valley AVA	LIVE
47	OR	Umpqua Valley AVA	LIVE
48	OR	Umpqua Valley AVA	None
49	OR	Umpqua Valley AVA	None
50	OR	Walla Walla Valley AVA	LIVE
51	OR	Walla Walla Valley AVA	LIVE
52	OR	Walla Walla Valley AVA	LIVE
53	OR	Walla Walla Valley AVA	None
54	OR	Walla-Walla AVA	None
55	OR	Willamette Valley AVA	LIVE
56	OR	Willamette Valley AVA	LIVE
57	OR	Willamette Valley AVA	LIVE
58	OR	Willamette Valley AVA	LIVE, Organic
59	OR	Willamette Valley AVA	Organic
60	OR	Willamette Valley AVA	Organic
61	OR	Willamette Valley AVA	Organic, Biodynamic
62	OR	Willamette Valley AVA	Organic, Biodynamic
63	OR	Willamette Valley AVA	None
64	OR	Willamette Valley AVA	None
65	OR	Yamhill-Carlton AVA	Biodynamic
66	OR	Yamhill-Carlton AVA	LIVE
67	OR	Yamhill-Carlton AVA	LIVE
68	OR	Yamhill-Carlton AVA	LIVE
69	OR	Yamhill-Carlton AVA	None
70	OR	Yamhill-Carlton AVA	None
71	WA	Ancient Lakes of Columbia Valley AVA	none
72	WA	Ancient Lakes of Columbia Valley AVA	none
73	WA	Columbia Gorge AVA	Organic
74	WA	Columbia Gorge AVA	none
75	WA	Columbia Valley AVA	LIVE
76	WA	Columbia Valley AVA	Organic
77	WA	Horse Heaven Hills AVA	LIVE
78	WA	Horse Heaven Hills AVA	Organic, Biodynamic
79	WA	Lake Chelan AVA	LIVE
80	WA	Lake Chelan AVA	none

81	WA	Naches Heights AVA	Organic, Biodynamic
82	WA	Naches Heights AVA	none
83	WA	Puget Sound AVA	none
84	WA	Puget Sound AVA	none
85	WA	Rattlesnake Hills AVA	LIVE
86	WA	Rattlesnake Hills AVA	none
87	WA	Red Mountain AVA	LIVE
88	WA	Red Mountain AVA	Biodynamic
89	WA	Snipes Mountain AVA	none
90	WA	Snipes Mountain AVA	none
91	WA	Wahluke Slope AVA	Organic
92	WA	Wahluke Slope AVA	none
93	WA	Walla Walla Valley AVA	LIVE
94	WA	Walla Walla Valley AVA	LIVE
95	WA	Yakima Valley AVA	Organic
96	WA	Yakima Valley AVA	LIVE
97	WA	Ancient Lakes of Columbia Valley AVA	none
98	WA	Ancient Lakes of Columbia Valley AVA	none
99	WA	Columbia Gorge AVA	Organic
100	WA	Columbia Gorge AVA	none
101	WA	Columbia Valley AVA	Organic
102	WA	Columbia Valley AVA	none
103	WA	Horse Heaven Hills AVA	Organic
104	WA	Horse Heaven Hills AVA	none
105	WA	Lake Chelan AVA	none
106	WA	Lake Chelan AVA	none
107	WA	Naches Heights AVA	Organic, Biodynamic
108	WA	Puget Sound AVA	none
109	WA	Puget Sound AVA	none
110	WA	Rattlesnake Hills AVA	none
111	WA	Rattlesnake Hills AVA	none
112	WA	Red Mountain AVA	Organic
113	WA	Red Mountain AVA	none
114	WA	Snipes Mountain AVA	none
115	WA	Snipes Mountain AVA	none
116	WA	Wahluke Slope AVA	Organic
117	WA	Wahluke Slope AVA	none
118	WA	Walla Walla Valley AVA	LIVE
119	WA	Walla Walla Valley AVA	none
120	WA	Yakima Valley AVA	Organic

Findings: First round of qualitative interviews. Once the interviews were completed and transcribed, I compiled the transcript files into an aggregate data set. I utilized ATLAS.ti, a qualitative data analysis program, to perform in-vivo coding of emergent themes, issues, words, and phenomena in the interview texts. With Atlas.ti, I performed two rounds of content analysis with the interviews collected. The first round of coding was emergent, intended to uncover grounded themes delineating examples of meanings surrounding sustainable viticulture the two regional industries, as well as examples of common practices defined as 'sustainable viticulture.' As is standard for qualitative coding, I developed the first order codes by using the terms, concepts, and language of the informants, and thus these codes were based on the data themselves (Gioia, Corley, & Hamilton, 2012; Van Maanen, 1979). In the second round of coding, I grouped terms and concepts into broader themes that were related to prior theory (Miles & Huberman, 1994). From these rounds of coding, three overarching theme categories emerged denoting conventions across both industries, as well as related examples of concrete viticulture practices into larger practice categories.

Findings from first round of coding for emergent beliefs and example practices. In the first coding round, the codes were emergent as I sought to gain insight into the assortment of meanings and practices surrounding sustainable viticulture in each of the regional industries (Keller & Loewenstein, 2011; Miles & Huberman, 1994).

Emergent beliefs. In the first round of coding, I identified phrases or ideas that expressed a meaning or definition related to sustainable viticulture as expressed by the interview participants. In an emergent coding process, I attached labels as I identified as meanings. surrounding sustainable viticulture (Miles & Huberman, 1994). Once created, I could attach a label to similar-sounding meanings expressed. This coding process resulted in a list of seven codes. Overall, the meanings related to sustainability found in this first round were primarily centered on proactive, natural approaches to vineyard management that boosted efficiency while having the lowest impact on the greater vineyard eco-system. For example, these codes expressed commonly-expressed approaches or mindsets taken by vineyard managers when deciding steps to take both in the short- and long-terms, for which the associated codes are "Approach – Hands on," "Approach – Minimal inputs," Approach – Systems thinking," et al.

Table 3: List of Vineyard Firms Included in Selected Sample for First Round Interviews

Count	*State*	*AVA/Location*	*Certifications*
1	OR	Applegate Valley AVA	LIVE
2	OR	Applegate Valley AVA	None
3	OR	Applegate Valley AVA	Organic, Biodynamic
4	OR	Chehalem Mountains AVA	Biodynamic
5	OR	Chehalem Mountains AVA	LIVE
6	OR	Chehalem Mountains AVA	Organic, Biodynamic
7	OR	Chehalem Mountains AVA	None
8	OR	Columbia Gorge AVA	Organic
9	OR	Columbia Gorge AVA	None
10	OR	Dundee Hills AVA	LIVE
11	OR	Dundee Hills AVA	LIVE
12	OR	Dundee Hills AVA	LIVE
13	OR	Eola-Amity Hills AVA	LIVE
14	OR	Eola-Amity Hills AVA	LIVE, Organic, Biodynamic
15	OR	Eola-Amity Hills AVA	LIVE
16	OR	Eola-Amity Hills AVA	None
17	OR	McMinnville AVA	LIVE
18	OR	McMinnville AVA	None
19	OR	McMinville AVA	Biodynamic
20	OR	Ribbon Ridge AVA	Organic, Biodynamic
21	OR	Rogue Valley AVA	LIVE
22	OR	Rogue Valley AVA	Organic
23	OR	Rogue Valley AVA	None
24	OR	Umpqua AVA	LIVE
25	OR	Umpqua Valley AVA	None
26	OR	Walla Walla Valley AVA	LIVE
27	OR	Walla-Walla AVA	None
28	OR	Willamette Valley AVA	LIVE, Organic
29	OR	Willamette Valley AVA	LIVE
30	OR	Willamette Valley AVA	None
31	OR	Willamette Valley AVA	None
32	OR	Willamette Valley AVA	None
33	OR	Yamhill-Carlton AVA	LIVE
34	OR	Yamhill-Carlton AVA	None
1	WA	Ancient Lakes of Columbia Valley AVA	None
2	WA	Ancient Lakes of Columbia Valley AVA	None
3	WA	Columbia Gorge AVA	Organic
4	WA	Columbia Gorge AVA	None
5	WA	Columbia Valley AVA	LIVE
6	WA	Columbia Valley AVA	Organic
7	WA	Horse Heaven Hills AVA	LIVE
8	WA	Horse Heaven Hills AVA	Organic, Biodynamic
9	WA	Lake Chelan AVA	LIVE

10	WA	Lake Chelan AVA	None
11	WA	Naches Heights AVA	Organic, Biodynamic
12	WA	Naches Heights AVA	None
13	WA	Puget Sound AVA	None
14	WA	Puget Sound AVA	None
15	WA	Rattlesnake Hills AVA	LIVE
16	WA	Rattlesnake Hills AVA	None
17	WA	Red Mountain AVA	LIVE
18	WA	Red Mountain AVA	Biodynamic
19	WA	Snipes Mountain AVA	None
20	WA	Snipes Mountain AVA	None
21	WA	Wahluke Slope AVA	Organic
22	WA	Wahluke Slope AVA	None
23	WA	Walla Walla Valley AVA	LIVE
24	WA	Walla Walla Valley AVA	None
25	WA	Yakima Valley AVA	Organic
26	WA	Yakima Valley AVA	None
27	WA	Yakima Valley AVA	None

Example practices. To identify examples of sustainable viticulture practices, I read the text closely and attached labels to those phrases and sentences that indicated an example of a viticulture practice. This process was also emergent, meaning that I attached labels as I identified practice examples. Once created, I could attach a label to similar-sounding practice examples. This coding process resulted in a list of sixty-two codes. Overall, the majority of practices given as examples were primarily focused on environmental practices, rather than social practices. For example, common practices have centered on land management, vine health, water usage, for which the associated codes are "Practices – Erosion control," "Practices – Soils," "Practices – Fertilizers," Practices – Vine health," and "Practices – Water usage."

Findings from second round of coding for overarching themes and practice categories. In second coding round, the codes developed in the first round were consolidated into overarching themes and categories as I delineated conventions and categories of sustainable viticulture practices across the two regional industries (Keller & Loewenstein, 2011; Miles & Huberman, 1994). I briefly outline these codes and their overarching themes below (see Table 4).

Overarching themes: Conventions. In the second round of coding, I found that across Oregon and Washington, organizations largely converge on viewing sustainable viticulture as being centered on three overarching themes or dimensions: engaged management, triple bottom line business model, and open-systems perspective.

Figure 2: List of Interview Questions for the First Round of Interviews

1) What comes to mind when I mention sustainability? [*prompt: looking for interpretations*]
   a. How do you think it relates to your organization?
   b. What comes to mind when I say "unsustainable"?
2) Can you briefly list 4-5 specific practices that come to mind that your organization does to be more sustainable in vineyard management? [*prompt: looking for list of items/examples*]
   a. Can you briefly list 2-3 specific vineyard management practices that people do that are unsustainable?
3) Do you have an environmental or 'sustainability' certification?
   a. If so…
      i. What is/are the name(s) of the certification(s)?
      ii. What was the motivation to invest in and/or adopt this/these particular certification(s)?
      iii. Please list 2-3 benefits that have resulted directly from adopting this/these certification(s).
      iv. Please list 2-3 problems or issues that have arisen directly from adopting this/these certification(s).
      v. What are 3-4 practices that you do differently after having obtained certification?
      vi. What are 3-4 practices that you do the same as you used to prior to having obtained certification?
      vii. What are 2-3 practices required by the certification that you would prefer not to do?
      viii. What are 2-3 practices required by the certification that you were not aware of prior to adopting the certification?
   b. If not…
      i. Do you intend to adopt an environmental certification in the future? Why or why not?
      ii. Can you list 2-3 environmental certifications for vineyards that you are aware of?
      iii. Are you knowledgeable regarding the practices included in any of the environmental certifications you listed?
      iv. What would be 2-3 benefits that you might perceive from adopting this/these certification(s)?
      v. What would be 2-3 problems or issues that you might perceive as resulting from adopting this/these certification(s)?
4) Can you tell me about a scenario in which a person in another company is trying to do – or have done – things to improve sustainability performance within their vineyard?

a. In your regional industry, let's say someone wanted to learn more about sustainable viticulture practices, would they feel supported in doing that?
b. In your regional industry, let's say someone wanted to adopt an environmental certification that involved making changes toward more sustainable viticulture practices, would they feel supported in doing that?
c. Do you get the sense that your colleagues in the regional industry think this is important?
d. Do you get the sense that your local trade association thinks this is important?
e. Do you get the sense that the greater wine industry thinks this is important?

5) Can you please list 3 sources of information from which you have learned about sustainable viticulture practices?
   a. How useful do you perceive these information sources to be in implementing new practices that integrate sustainability?
   b. If certified:
      i. How useful has/have the certification agency(ies) been as a source(s) of assistance in implementing new practices that integrate sustainability?
   c. If not certified:
      i. How useful do you perceive certification agencies to be as sources of assistance in implementing new practices that integrate sustainability?

6) If I'm a new vineyard management employee in this organization, what am I expected to do on a day-to-day basis around sustainability? How would l learn about this? [*prompt: looking for description of the "everyday"*]
   a. Can you describe a situation that I would notice going on that would appear sustainable?
   b. Can you describe a situation that I would notice going on that would appear unsustainable?
   c. What I might feel constrained to do?
   d. What might I expect that I should be doing that is not yet happening?

First, interview participants share consensus surrounding "engaged management" as being a primary dimension of sustainability in both the Oregon and Washington wine industries. Participants expressed the need to view directing a sustainable vineyard business as long-term land management; this view emphasizes preservation of a site's viability to produce grape crops year after year by utilizing natural-but-minimal inputs, such as fuel, chemicals, and water, in vineyard practices. One vineyard manager expressed how sustainability is defined as engaged management in the following statement:

And we manage our vineyard by vine. That's slower, but I think the plants do

> better. … A vineyard can last 100+ years, if it's well taken care of. You can burn these plants out in 5 or 6 years if you mismanage them (Oregon, August 2013)

Thus, the majority of vineyard managers interviewed expressed a similar belief that sustainability in viticulture requires hands on, engaged management and attention to detail.

Second, interview participants share consensus surrounding sustainability as meaning that environmental and social concerns related to business practices need to be balanced with economic profitability of staying in business over the long-term. In this way, participants expressed the need for a "triple bottom line" business model, in which ideal environmental management practices need to compromise with cost effectiveness and contract requirements to buyers. One vineyard manager expressed how sustainability is defined as a triple bottom line approach in the following statement:

> But the problem is, in growing grapes, there's time when they do get pests, or they do get things like mildew. That – you still have to deal with that. And I'm not sure that would qualify you as organic if you did that. You know, it's either that or lose your plants. If you lost your plants, that wouldn't be very sustainable (Washington, August 2013

Thus, the majority of vineyard managers interviewed expressed a similar belief that sustainability in viticulture requires conducting day-to-day activities in a way that minimizes the use of chemicals and other inputs, but that effective action is taken if and when a crop-threatening issue arises.

> Third, many interview participants expressed that sustainability meant viewing their vineyard company as being embedded in a larger system of the wine industry, community, and natural environment. In this way, participants expressed not only the need to consider far-reaching effects of their vineyard practices on neighbors and consumers, but also opportunities to learn more about sustainable viticulture from industry-related experts and research external to their own company or even industry. This theme indicates an "open-systems perspective" held by vineyard managers regarding the importance of attending to sustainability issues in their organizations.

One vineyard manager expressed how sustainability is defined as an open-systems perspective in the following statement:

> And what we're trying to do now is adopt an environmental risk assessment … And that's really cool because … it evaluates the whole environment, and the whole process – not just the chemical and what it's being used for. So that's something we're trying to adopt and improve upon. Looking at it as a whole

> system, not just one product. Because the way that they look at it also, it's not just the product, they take how much of it you're using, what time of year, what type of soils you have, those sorts of things. That's, to me, a stronger program when you're looking at the whole system, not just one product (Oregon, August 2013)

Thus, the majority of vineyard managers interviewed expressed a similar belief that sustainability in viticulture requires looking at the practices and actions carried out in the vineyard are not localized, but instead affect an entire system of plants over time.

Practice categories. Taking the list of codes denoting sustainable viticulture practices based on the qualitative data, I analyzed the quotations one by one in order to subjectively identify similarities or differences between practice codes. As I identified similar or related practices, I would create and label a category that described the relationship between those sets of practices. Once category label was created, I could then attach it to new practices as I analyzed the list of codes. Once all practices had an attached category label, I then subjectively analyzed the categories drawing on prior theory as a guide, to determine if some categories were related to one another in meaning, and consolidating the practices into a larger category if so. This process was iterative, meaning that I analyzed and categorized practice codes until practice categories were sufficiently distinct to preclude any further consolidation. This second round of coding resulted in the identification of five overarching categories of practices, including: equipment and facilities management, information management, land management, materials management, and vine-plant management (see Table 5). These individual practices and corresponding categorization scheme were confirmed with industry informants.

Equipment and facilities management category. First, for the equipment and facilities management practice category primary groups of practices that emerged as common across interviewees as being 'sustainable' include those regarding pre-setting a schedule to minimize the number of passes taken with the tractor; and retrofitting existing buildings instead of building new facilities. One vineyard manager provided an example of sustainable practices that involve equipment in the following statement:

> Things such as mowing every other row, or tilling every other row, those are all LIVE practices, which we try to do. You know, reduce tractor passes, all those types of things. That's how you're going to get the healthiest grapes (Oregon, August 2013)

Table 4: Linking Emergent Codes on Meanings and Categories of Overarching Themes

First round of coding		***Second round of coding***	
Emergent meanings	***Description***	***Overarching theme***	***Example Quotes***
"Hands on" management	• Attention to detail • Managing vine-by-vine • Being involved in daily vineyard operations • Taking direct involvement in vineyard management rather than absentee role	Engaged decision making in day-to-day practices	• "It's very hands on … Our business is my wife and myself. We started it from bare earth. Then you could argue we've got a little control-freak in us, but it's the way we want it done." (OR) • "And we manage our vineyard by vine. That's slower, but I think the plants do better. … A vineyard can last 100+ years, if it's well taken care of. You can burn these plants out in 5 or 6 years if you mismanage them." (WA)
Homeopathic remedies	• Choosing most natural way to address issue as possible • Focusing on prevention rather than treatment		• "The biodynamic program is more of a homeopathic way of managing. And that's ok, but you've got to keep common sense too. I mean, watch it, watch it, do everything you can, keep on the program. But if you see something drifting, at least you can grab into your organic bag of something … and try to help the plant." (WA)
Minimal inputs	• Employees are deciding to use as minimal an intervention as possible in day-to-day • Would like to use almost no off-site inputs at all (e.g., fertilizers, chemicals, insecticides, water, or fuel), but know must have to, so always aim for minimum possible • When do need to use off-site input, use as little as possible and as targeted as possible		• "One of the things that I would say that satisfies us about the philosophy behind our [sustainability program] … is understand what you're doing and do only what makes sense in the context of that understanding." (OR) • "Whatever the needed practice is in the vineyard, our goal is to minimize the inputs into the vineyard and into the environment. And make any input that we do use – well, for example, inputs such as chemicals – we make those chemicals be as soft as possible, and targeted as possible. And in just the minimum quantities to get the job done." (OR)

First round of coding		*Second round of coding*	
Emergent meanings	***Description***	***Overarching theme***	***Example Quotes***
Proactive planning	• Employees are deciding to use as minimal an intervention as possible in day-to-day • Planning ahead to be as natural as possible, but also to have the least harsh remedies in place for the inevitable issues • Being informed of both daily on-the-ground issues through record-keeping, but also of things going on externally that might help vineyard in future (i.e., university research) • Seeking outside information to plan vineyard management instead of waiting for issues to arise and reacting to them ad hoc		• "The rest of the vineyard, which I'm sitting in right now, has not received ever an insecticide. It's been sprayed twice with [organic compounds] for powdery mildew, and hasn't been sprayed at all this year and we're finding no powdery mildew. So by doing more work with trellising and canopy management, we've eliminated several of the so-called common pests that people have to deal with. In my view, powdery mildew in this area is a sign of bad canopy management. So are leaf-hoppers." (WA) • "We know ahead of time what we're going to be doing, and what kind of things we're going to do. We take a very deliberate approach to protecting the environment, and improving the quality of the vineyard. … So you don't just grab a chemical off the shelf – you use it in a very deliberate fashion, knowing what its effects are and requirements are." (OR)
Practical decision making	• Ensuring business profitability maintained in coherence with firm's best practices • Strategic decisions being made by managers and proprietors in relation to internal audience • Firm uses Triple Bottom Line approach as metrics it strives to meet (e.g., balancing environment & social concerns with needs of staying in business)	"Triple-bottom line" (TBL) orientation in firm strategy	• "For [our firm], it's a pretty big part of our general philosophy. It's been from day one, the original owners, have pretty much been into the sustainability movement. And it encompasses everything we do out in the vineyards. Bringing the grapes into the winery, and then also into our sales and marketing team, packagings, etc. So it really is a pretty important philosophy for [our firm]." (OR) • "I mean, there's some practices that we do that I wish we didn't have to do. I grow for people – in other words, I have to deliver fruit. … So, at times I'm having to use what I call synthetic chemicals, or manmade chemicals, to prevent certain problems in the vineyard, like botrytis [rot] and powdery mildew. And I'd prefer not to have to do that, I wish I could be 100% organic, but I mean I've got to deliver the goods. So I'm pretty much at the whim of people that I sell my fruit to – to have to deliver the fruit – and therefore I have to sometimes use some chemicals that I'd rather not use in the vineyard. That's the way it is." (WA)

First round of coding		*Second round of coding*	
Emergent meanings	***Description***	***Overarching theme***	***Example Quotes***
Systems thinking	• Thinking of vineyard as a whole eco-system rather than as a single crop or stand-alone system • Thinking of one set of vineyard practices as affecting other practices or aspects of your vineyard • Thinking of your own vineyard as being part of greater eco-system of regional industry	Open systems perspective in firm operations and strategy	• "Limiting the number of passes we make in the vineyard to just those that are necessary, and doing them at the right time so we're not creating problems for ourselves later on down the road that we have to then go fix." (OR) • "I think Oregon has a really great climate for [sustainability]. ... I went to the Oregon Wine Symposium and they were talking about [sustainable viticulture], I kept hearing it and hearing it, and I was like 'well what is this all about?' and then I learned about it. Which is good, they're definitely putting it out there. It's really smart because you know, down the line, more and more things are going to become regulated to the environmental concerns. So the sooner viticulturists and vineyard managers start implementing these practices, the better. In the long run they will be for us and for vineyard health and for everyone." (OR)
Long-term process	• Practices utilized each year affects the health of the vineyard over the long-term, instead of looking at the grape crop each year as a separate entity • Achieving a Triple Bottom Line business model can take years to achieve (i.e., it's hard to remain sustainable economically as a business if pouring money into costly retrofitting)		• "This is a long-term thing. A vineyard can last 100+ years, if it's well taken care of. You can also burn these plants out in 5 or 6 years if you mismanage them. And they just have lower yields and so forth. So I look at the long-term thing, instead of the short-term thing. And set a direction that we think is correct and that's what we do." (WA)

Overall, many vineyard managers interviewed expressed similar examples of practices involving equipment that focused on minimizing reliance on machine tools, such as tractors, and instead relying more on nature-based, preventative practices, which might involve more manual labor.

Information management category. Second, for the information management practice category, primary groups of practices that emerged as common across interviewees as being 'sustainable' include those regarding reaching out to industry-related experts, such as university researchers and environmental certification organizations, to augment own knowledge regarding spraying chemicals in vineyard; and keeping detailed records of events and issues that arise in vineyard throughout the year, which are then used to develop an integrated set of practices that are aimed at mitigating similar issues in future years. One vineyard manager stated:

> [Record keeping] just really helped me take a harder, closer look at my site and really try to get to know it better. The different blocks and where the winds are coming from, where the hot spots are in it, where the cold spots are in the winter time, where my gopher populations are, what my deer pressures are. I mean … when I'm in the vineyard, I'm always looking for what's going on for the season. And I think the [record -keeping] I have to do every year, has really helped me be more aware (Washington, August 2013)

Overall, many vineyard managers interviewed expressed similar examples of practices involving information that focused on gaining an awareness not only of what was going on in their own vineyard and designing integrated practices from this information, but also obtaining new knowledge on sustainable viticulture practices through external, industry-related sources.

Land management category. Third, for the land management practice category, primary groups of practices that emerged as common across interviewees as being 'sustainable' include those regarding building retention ponds to mitigate potential risk of soil and fertilizer erosion in streams and waterways on property; and growing cover crops between rows of vines in order to both create ground cover to mitigate soil erosion, as well as to cultivate a population of 'beneficial insects' that prey on pest insects. One vineyard manager provided an example of sustainable practices that involve land management in the following statement:

Table 5: Linking Practice Examples with Consolidated Practice Categories

First round of coding		*Second round of coding*	
Emergent practices	***# quotes coded***	***Practice Category***	***Example Quotes***
Practice - Mechanized	8	Equipment & Facilities Management	• "Things such as mowing every other row, or tilling every other row, those are all LIVE practices, which we try to do. You know, reduce tractor passes, all those types of things. That's how you're going to get the healthiest grapes" (OR, August 2013) • "That's another thing that I suppose we try to do – is put more than one implement on the tractor at a time so you're not just mowing. You're mowing and doing something else at the same time. So you're eliminating a full pass through the vineyard" (OR, August 2013)
Practice - Worker safety	9		
Practice - Worker well-being	6		
Practice - Develop own sustainability program	19	Information Management	• "[Record keeping] just really helped me take a harder, closer look at my site and really try to get to know it better. The different blocks and where the winds are coming from, where the hot spots are in it, where the cold spots are in the winter time, where my gopher populations are, what my deer pressures are. I mean … when I'm in the vineyard, I'm always looking for what's going on for the season. And I think the [record -keeping] I have to do every year, has really helped me be more aware" (WA, August 2013) • "I might also say that certain irrigation practices perhaps could be viewed as unsustainable. Whereas if you're irrigating, you could be using a pressure log, or a pressure sensor. Again it has to do with actually monitoring what's going on in your vineyard instead of just putting on x amount of gallons just because it's on the calendar" (OR, August 2013) • "It's more giving you options … – the education part. [LIVE is] very high on that, it's a high priority for LIVE, it is informing and educating growers. Particularly around new chemistries, new products. And so having that ability to use them as an education. And they keep adding, basically, different tools or different chemistries that you can use and it's up to us to manage accordingly" (OR, August 2013)
Practice - Do only what fits site or issue	39		
Practice - Follow certification guidelines	25		
Practice - Follow industry best practices	21		
Practice - Hiring vineyard management company	7		
Practice - Learn about certifications	11		
Practice - Participate with Certification	19		
Practice - Participate with University	7		
Practice - Record keeping	27		
Practice - Seek outside information	9		
Practice - Training vineyard management company to own sustainable practices	6		
Practice - Beneficial insects	12	Land Management	• "And that's a huge part of sustainability, you know, not robbing the soil of everything and then trying to put back on nutrients in liquid form, which sometimes is not organic or sustainable. So building good soil base" (OR, August 2013)
Practice - Biodiversity	6		
Practice - Cover crops	11		

First round of coding		*Second round of coding*	
Emergent practices	***# quotes coded***	***Practice Category***	***Example Quotes***
Practice - Eco-zones	6		• "However, the added benefit [of planting cover crops is] is we will also be able to mulch that later, and that also goes into the secondary sustainable, I would say, portion of cover cropping – is that the idea is that if you put in a Nitrogen rich cover crop, that's very diverse, we won't actually have to put on any fertilizers. So you will be using the nutrients from the cover crop itself for the vines. So it's dual, it has a dual purpose" (OR, August, 2013) • "So with [cover crops] we are looking to prevent erosion. We have quite a steep vineyard, and so making sure our cover crop is applied in a timely manner and that it's a substantial enough rate to keep the erosion from happening during the winter rains. Because we're very aware, we have some ponds, and some watersheds close to us, so it's as a vineyard we are quite aware that we are surrounded by water, and that we are the ones upstream" (OR, August 2013)
Practice - Erosion control	6		
Practice - In-row cultivation	7		
Practice - Let nature self-manage	8		
Practice - Mowing	13		
Practice - Pest management	11		
Practice - Plant what fits site	10		
Practice - Soils	40		
Practice - Composting	7	Materials Management	• "There's a lot of things with spray programs that are just simply trying to stay ahead of the game. And depending on where you get your spray program from – organic or other spray program – … you're adding all sorts of things that you may not honestly need. But it's very good for the vendor who's selling it to you because your spray programs are expensive. So I thought 'Well, ok they have a valid point, don't use products that you don't necessarily need.' So I really throttled it back. … And I hope it maintains what it's doing, because now it's in balance" (OR, August 2013) • "And so, most of the bottlings that we do now are in much more lightweight glass and so we've cut down on our weight for transportation, our carbon footprint for moving wines all around the country. We've cut that down" (WA, August 2013) • "Not using any, any commercial fertilizers" (WA, August 2013)
Practice - Chemicals	53		
Practice - Fertilizers	8		
Practice - Fuel use	9		
Practice - Make own on-farm inputs	11		
Practice - Packaging	11		
Practice - Purchase off-farm inputs	10		
Practice - Spraying chemicals	46		
Practice - Water use	10		
Practice - Canopy	9		
Practice - Nutrients	10		
Practice - Pruning	6	Vine-plant Management	• "But I think that following those sustainable practices gives us – produces for us – a very healthy vineyard. A vineyard that is well balanced. The vines are well balanced. That we protect the ecological balance [and] that we use as few external resources. We leave as small a footprint as possible in the environment of our vineyard. That's really our goal" (OR, August 2013) • "The vines have to be completely in balance. And the vines have to be healthy. And I don't totally agree with the struggle things that the winemakers talk about. I definitely don't agree with just one cluster per shoot, and you know 1.5 tons or

First round of coding		*Second round of coding*	
Emergent practices	***# quotes coded***	***Practice Category***	***Example Quotes***
Practice - Vine health	23		some mathematical thing that you throw at the vineyard. It really doesn't mean a lot when it comes to agriculture. … And basically, my opinion on that whole thing is – what you want is a healthy vine, you want a vine completely in balance. That may be 1 ton an acre, that may be 3 tons an acre. That depends on your soils. It depends upon your trellis system that you're using. It depends upon your spacing – is it logical that you have 1300 plants an acre, that they produce the same volume as if you have 4000 plants an acre? No" (OR, August 2013)

> And that's a huge part of sustainability, you know, not robbing the soil of everything and then trying to put back on nutrients in liquid form, which sometimes is not organic or sustainable. So building good soil base (Oregon, August 2013)

Overall, many vineyard managers interviewed expressed similar examples of practices involving the vineyard land that focused on maintaining the balance of nutrients in the soil, and thus enhancing the ability of the land to produce a high quality grape crop.

Materials management category. Fourth, for the materials management practice category, primary groups of practices that emerged as common across interviewees as being 'sustainable' include those regarding types and quantities used of organic compounds and synthetic chemical compounds in pest- and disease-deterrent sprays; and producing and managing fertilizers from animals rather than from manmade materials. One vineyard manager provided an example of sustainable practices that involve materials management in the following statement:

> My goal is to attempt to grow grapes and make good wine, while minimizing my use of inputs – things I have to bring onto the farm. So we, for instance, use the lightest weight wine bottle possible because we have determined that that's the biggest part of our carbon footprint in our production of wine. We're attempting to farm without the use of pesticides (Washington, August 2013)

Overall, many vineyard managers interviewed expressed similar examples of practices involving materials focused on using the minimal quantities necessary of the least harmful products that could be found to treat issues that arise in their vineyards.

Vine management category. Finally, for the vine management practice category, primary groups of practices that emerged as common across interviewees as being 'sustainable' include designing and maintaining a canopy and trellis system that prevents mold from setting in; and monitoring vine health via regular tissue tests, which are conducted to identify nutrient deficiencies so that action can be taken before vines start showing signs of distress. One vineyard manager provided an example of sustainable practices that involve the management of vine health in the following statement:

> But I think that following those sustainable practices gives us – produces for us – a very healthy vineyard. A vineyard that is well balanced. The vines are well balanced. That we protect the ecological balance [and] that we use as few external resources. We leave as small a footprint as possible in the environment of our vineyard. That's really our goal (Oregon, August 2013)

Overall, many vineyard managers interviewed expressed similar examples of practices involving vine health that dismiss prior industry advice to "distress" the vines in order to produce higher quality wines, and instead grow a healthy grape crop by maintaining vines that appear healthy.

Summary: First round of qualitative interviews. From the 26 interviews collected and analyzed, saturation was reached regarding both abstract sustainability definitions and concrete sustainable practices. That is, the common themes discussed and types of practices provided indicated as being representative of sustainability in their organizations and regional industry were expressed by the majority of interview participants. Furthermore, interview analyses show that these themes and practices are shared amongst vineyard managers in both Oregon and Washington, demonstrating strong consensus in meanings surrounding 'how things are done' regarding sustainable viticulture in these two regional industries. All in all, these findings indicate that sufficient qualitative data had been gathered at this stage to begin the preliminary formulation of CCM items for the survey.

Method: Quantitative CCM survey. In this section, I review the development, piloting, and deployment of the CCM survey utilizing the findings from the qualitative interview data gathered in the first round of interviews. I also discuss the techniques utilized in the CCM analyses.

CCM survey instrument development. The theoretical construct of cultural competence is considered a scale, or theoretical variable, for which I developed items, or indicator variables, to measure particular dimensions or aspects of the construct with regard to sustainability conventions (Bernard, 2006; Kline, 2011). Having uncovered categories of sustainable viticulture conventions across the two regional industries, I developed items for a scale measuring the cultural competencies with regard to the sustainability conventions of participating organizations. These items describe scenarios that exemplify the sustainable viticulture conventions reported in Oregon and

Washington, aiming to utilize terminology provided by interview participants (Keller & Loewenstein, 2011). The scale for cultural competency contains items generated from all of the organizations in which interviews are conducted, meaning that survey respondents from the Oregon wine industry were presented with scenarios described by informants in the Washington wine industry, and vice versa. There were three further sections included in the survey intended to capture information on respondent organizations' ECMS status and history, commonly enacted practices, and background characteristics.

Cultural competency scales and items. First, there was a scale with which to assess cultural competencies of participating organizations. This scale was intended to evaluate the preference of respondent organizations with scenarios describing unsustainable and sustainable viticulture conventions in both the Oregon and Washington wine industries. Following the design of a CCM survey in a previous study by Keller & Loewenstein (2011), I designed these items to have respondents choose one of two possible scenarios. Responses to these items provided measures for each organization on their level of competencies, or knowledge, regarding sustainable viticulture conventions in their regional industry. Data from this scale emerged as a participant-by-response matrix for each organization, which was analyzed together to measure the magnitude of shared cultural knowledge regarding sustainability cultural resources among organizations within the same regional industry (Weller, 2007). I included no fewer than 20 items in the scale for cultural competency; 20 items is designated as the lowest possible number of items to include on a CCM survey in order to elicit unbiasedconsensus modeling results, and with an industrious target population I wanted to avoid unnecessary items that might cause 'response fatigue' in the respondents (Dillman et al., 2009; Weller, 2007). Please refer to Appendix E for the full, distributed survey instrument.

As is demonstrated in Table 6, I designed two 'levels' of items to measure a cultural competency scale regarding sustainable viticulture conventions held by vineyard firms in the wine industries of Oregon and Washington. Specifically, there are 'unsustainable' and 'sustainable' levels of scenarios, each developed in sets related to the same practice sub-categories; this set-up is intended to quantitatively measure the strength of the consensus among respondent organizations surrounding the shared

sustainability conventions uncovered via the qualitative interview analysis (Keller & Loewenstein, 2011). Results from these sets of related items aimed to delineate groups of stronger or weaker competencies in respondent organizations surrounding shared sustainability meanings and practices.

To formulate items for the cultural competency scale, I selected the two most popular practice categories as uncovered through content analysis of the interview data: materials and land management. Two categories were sufficient to create a set of 20 items; including more than two practice categories would have resulted in over 50 items, which could contribute to response fatigue (Dillman et al., 2009). In total, 40 items, consisting of two scenario statements each, were developed including both materials and land management practices. With this design, I aimed to more accurately measure both consensus and variance between survey respondents in assessing cultural competencies regarding sustainability conventions in a respondent organization's respective regional wine industry.

Commonly enacted practices in regional industry. For the purposes of this dissertation, I needed to obtain information approximating respondent organizations' everyday practices regarding sustainable viticulture. To correspond with the cultural competency items asked in the first section, I put together a list of the practices associated with each of the 40 scenarios in the 20 items; this list of practices was drawn from both the 'unsustainable' and the 'sustainable' scenarios, and corroborated with the list of land and materials management practices in Table 5. As some of the 20 practices used in the CCM scale described similar practices, such as the use of particular chemicals or fertilizers, the final list of commonly enacted practices was numbered at 17. Respondents were asked to rate each of the items on a 4-point Likert scale, ranging from "1 – Very Uncommon" to "4 – Very Common." To see the list of commonly enacted practices generated, see Table 7.

ECMS information. With respect to ECMS information, respondent organizations were asked to indicate answers from lists provided of key ECMS status characteristics that most closely matched their own background. For the purposes of this dissertation, I needed to obtain information describing respondent organizations' use of ECMS. Therefore, I asked two questions to all respondents to ascertain awareness of ECMS, as

Table 6: Formulation of Items for Cultural Competency Scale from Materials and Land Management Practices Categories

Practice Category	*Practice Sub-Category*	*Material*	*Practice Type*	*Practice Options*	*Survey Items – Cultural competency scale*
Materials Management	Chemicals	Minimal	Sustainable	Integrated practices	1a) The vineyard manager designs a system of integrated pest management practices in such a way that minimizes the use of chemicals in the vineyard.
			Unsustainable	Rely on chemicals	1b) The vineyard manager relies solely on spraying chemicals to control pest issues in the vineyard.
		"O"rganic (i.e., USDA definition) (e.g. Sulfur)	Sustainable	Treat only when issue arises	2a) The vineyard manager sprays USDA Organic insecticides to control issues with insect pests, only when signs of insect pests appear in the vineyard.
			Unsustainable	Spray entire vineyard (kills beneficials)	2b) The vineyard manager regularly sprays USDA Organic insecticides throughout the entire vineyard to prevent issues with insect pests that might arise.
			Sustainable	Minimal effective quantities	3a) The vineyard manager sprays Sulfur in the vineyard to avoid mildew issues, using only the minimum effective amount permitted to control the pest issue.
			Unsustainable	Large quantities	3b) The vineyard manager sprays Sulfur in the vineyard to avoid mildew issues, using as much Sulfur as needed to prevent mildew from arising.
			Sustainable	Proactive	4a) The vineyard manager sprays Sulfur to prevent mildew issues from arising in the vineyard.
			Unsustainable	Reactive	4b) The vineyard manager sprays Sulfur to treat mildew issues, only after mildew has arisen in the vineyard.
		Synthetic chemicals (i.e., non-carbon-based et al.)	Sustainable	Minimal quantities	5a) The vineyard manager sprays a synthetic chemical in the vineyard to control an insect pest infestation, using the minimal effective amount as specified on the "label" as a guide to control the insect pest issue.
			Unsustainable	Large quantities	5b) The vineyard manager sprays a synthetic chemical in the vineyard to control an insect pest infestation, using as much of the chemical as permitted by the "label" to ensure control of the insect pest issue.
			Sustainable	Use least harsh but effective substance	6a) The vineyard manager sprays synthetic chemicals in the vineyard to prevent mildew issues – using only those chemicals approved by an environmental certification organization.
			Unsustainable	Use harsh but effective substance	6b) The vineyard manager sprays synthetic chemicals in the vineyard to prevent mildew issues – using only those chemicals marketed by chemical companies as being the most effective in preventing mildew.
			Sustainable	Spraying in advance	7a) The vineyard manager chooses to spray synthetic chemicals throughout the entire vineyard to prevent issues with insect pests from

Practice Category	*Practice Sub-Category*	*Material*	*Practice Type*	*Practice Options*	*Survey Items – Cultural competency scale*
					arising.
			Unsustainable	Spraying to treat issue	7b) The vineyard manager chooses to spray synthetic chemicals throughout the entire vineyard to treat an insect pest infestation only after one occurs.
	Fuel	Biodiesel	Sustainable	Use biodiesel	8a) The vineyard manager uses only biodiesel fuel in their tractor.
			Unsustainable	Use petroleum-based diesel	8b) The vineyard manager uses only petroleum-based diesel fuel in their tractor.
		Diesel	Sustainable	Minimizes tractor use	9a) The vineyard manager plans ahead in an effort to minimize the number of tractor passes through the vineyard for the year.
			Unsustainable	Use tractor ad hoc	9b) The vineyard manager uses the tractor as needed throughout the year.
	Fertilizers	Organic	Sustainable	Use manure to address various deficiencies	10a) The vineyard manager spreads animal manure in the vineyard to address multiple nutrient deficiencies in the vineyard soil.
			Unsustainable	Use commercial fertilizer to address various deficiencies	10b) The vineyard manager spreads a commercial fertilizer in the vineyard to address multiple nutrient deficiencies in the vineyard soil.
Land Management			Sustainable	Compost – all nutrients	11b) The vineyard manager spreads composted materials in the vineyard to address a potassium deficiency in the vineyard soil.
			Unsustainable	Commercial fertilizer - targested	11a) The vineyard manager spreads a commercial fertilizer rich in potassium in the vineyard to address a potassium deficiency in the vineyard soil.
			Sustainable	Grows and only cultivates cover crop at end of year	12a) The vineyard manager grows and maintains a perennial cover crop in the alleyways between vine rows, cultivating the cover crop into the soil after harvest.
			Unsustainable	Regularly mows cover crop in alleyways	12b) The vineyard manager grows a perennial cover crop in the alleyways between vine rows, regularly mowing the cover crop throughout the year.
		Synthetic chemical	Sustainable	Spot treatment	13a) The vineyard manager spreads fertilizer in vineyard sections where soil tests indicate there are distinct nutrient deficiencies.
			Unsustainable	Cover entire vineyard, not deficient in nutrients	13b) The vineyard manager spreads fertilizer in vineyard sections where there are typically nutrient deficiencies, without first conducting soil tests.
			Sustainable	Grow grasses surrounding vineyard	14a) The vineyard manager grows and maintains grasses around the perimeter of the vineyard site, or in a nearby meadow.

Practice Category	*Practice Sub-Category*	*Material*	*Practice Type*	*Practice Options*	*Survey Items – Cultural competency scale*
				perimeter	
			Unsustainable	Mow grasses around vineyard perimeter	14b) The vineyard manager regularly mows grasses around the perimeter of the vineyard site, or in a nearby meadow.
			Sustainable	Plant cover crops between rows of vines	15a) The vineyard manager grows and maintains grasses in the alleyways between the vine rows.
			Unsustainable	Leave the rows between vines unplanted	15b) The vineyard manager leaves the soil unplanted in the alleyways between the vine rows.
		Nutrients	Sustainable	Conduct regular soil tests for nutrient content	16a) The vineyard manager assesses soil health solely by conducting regular soil tests throughout the vineyard.
			Unsustainable	Never conducting soil tests	16b) The vineyard manager assesses soil health solely by looking at the vigor of the canopy.
			Sustainable	Plant cover crop between rows of vines, rich in nutrient deficient in the soils	17a) The vineyard manager grows a cover crop that is rich in a nutrient that is deficient in the soil in the alleyways between the vine rows.
			Unsustainable	Plant nothing between rows	17b) The vineyard manager leaves the alleyways between the vine rows unplanted, and spreads fertilizers to address nutrient deficiencies in the soil.
	Weeds/Pests Native grasses	Chemicals	Sustainable	Rotate compounds to prevent resistance	18a) The vineyard manager sprays the minimum effective amounts of various chemical compounds to fight invasive weeds in the vineyard.
			Unsustainable	Use same chemical	18b) The vineyard manager sprays the minimum effective amount of one chemical compound to fight invasive weeds in the vineyard.
			Sustainable	Native grasses for beneficial insects	19a) The vineyard manager grows tall grasses in the alleyways between vine rows to provide a habitat for beneficial insects.
			Unsustainable	Mows to control weeds	19b) The vineyard manager regularly mows the grasses in the alleyways between vine rows to control weeds.
	Water use	Dry farm	Sustainable	Do not use irrigation in wet climates	20a) The vineyard manager typically does not irrigate a vineyard located in a wet climate.
			Unsustainable	Use irrigation in wet climates	20b) The vineyard manager typically irrigates a vineyard located in a wet climate.

well as to ascertain if a respondent organization has adopted an ECMS or not. If the organization had never adopted an ECMS, they were asked no further questions. If the organization had adopted an ECMS, currently or in the past, they were prompted to answer a different list of questions involving types of ECMS adopted, years with ECMS, magnitude of operational changes experienced as a result of ECMS adoption, and involvement with the ECMS organization.

Table 7: Generated list of commonly enacted practices

Practices	***1 = Very Uncommon***	***2***	***3***	***4 = Very Common***
1) Avoiding use of all chemical sprays.				
2) Spraying USDA Organic compounds.				
3) Spraying synthetic chemical compounds.				
4) Using biodiesel.				
5) Using petroleum-based diesel.				
6) Spreading animal manure in the vineyard soil.				
7) Spreading composted materials in the vineyard soil.				
8) Using a commercial fertilizer.				
9) Mowing in the alleyways between the vine rows.				
10) Cultivating cover crops into the soil of the alleyways between vine rows.				
11) Growing cover crops in the alleyways between vine rows.				
12) Conducting soil tests.				
13) Irrigating your vineyard.				
14) Avoiding irrigation in your vineyard entirely.				
15) Growing grasses around the perimeter of your vineyard, or in a nearby meadow.				
16) Leaving the soil unplanted in the alleyways between vine rows.				
17) Fostering population of beneficial insects on your vineyard site.				

Background information. With respect to background information, respondent organizations were asked to indicate answers from lists provided of key organizational characteristics that most closely matched their own background. The data regarding background information included lists of responses chosen, being binary, categorical, or ranking variables. This data provided descriptive insights into similarities and differences between organizations, which were used in part to investigate any patterns in characteristics that underlay the groupings of organizations that share the same levels of cultural competencies that emerged from the analysis (Bernard, 2006; Kline, 2011). For

example, age, size, and location of respondent organizations was requested, as well as grape varietals grown, operations conducted, management structure, and educational background of vineyard manager.

CCM survey piloting and pre-testing.. The preliminary CCM survey questionnaire was pre-tested with a pilot group of respondents in order to ensure the survey items were easily understood and representative of how interview subjects defined sustainability (Bernard, 2006; Dillman et al., 2009). In December 2013, I recruited six vineyard managers from the sample frame to participate in pre-testing items on the questionnaire (Dillman et al., 2009). The pre-testing proceeded as follows. First, I built the preliminary CCM survey questionnaire in Qualtrics, the online program through which the questionnaire would ultimately be deployed. Next, I distributed a link containing an anonymous user identification code to each of the four pre-test participants. Each respondent was prompted to take the pre-test survey, and then to send me an email describing any confusions or concerns encountered with the items on the survey. I used their feedback to edit the survey questionnaire; I then repeated this process with two other vineyard managers to test the effectiveness of any changes made.

Survey deployment. Once piloted, the survey questionnaire was ready for deployment. The survey was deployed online at the end of January 2014, and then closed to respondents by the end of March 2014. The survey questionnaire was deployed online to the target population via the program Qualtrics. Qualtrics is a commonly utilized tool to deploy survey questionnaires to large populations online, with the functionality to design randomized and timed questions, and export collected data into the desired Excel format for further analysis in a range of statistical software tools (Sue & Ritter, 2007). An online deployment method was recommended to me by several interview participants, namely stating that with a large and dispersed population who are used to filling out paperwork into online forms, an online survey would be most "natural" or "expected" or "easiest" for this set of respondents.

The deployment procedure occurred as follows (Dillman et al., 2009; Sue & Ritter, 2007). First, to ensure the privacy of the identifiable information of survey participants, Qualtrics created unique identifiers for each of the vineyard organizations in the target population. I then sent each participant an email message containing the link to

the survey. I then closed the survey questionnaire availability to participants in Qualtrics in March 2014, and downloaded the collected data into an Excel spreadsheet for analysis preparation.

Data: Survey response rates and demographic statistics. The sample collected from the survey is representative of the industry population regarding location, ECMS adoption status, and size. Regarding locations, the survey was distributed to 539 potential respondents, 334 of which were located in Oregon, and 205 of which were located in Washington. After multiple rounds of follow up to prompt participation, in total, there were a total of 118 completed survey responses collected. This overall number of respondents is sufficient for consensus modeling, which requires between 100 and 200 responses (Weller, 2007).

At the time of this writing, in the Pacific Northwest 360 vineyard organizations had adopted an ECMS, which would be approximately 45% of total vineyards. Regarding ECMS status, the survey collected sample (N = 118) is representative of this industry feature, with 56% of respondent organizations having adopted an ECMS, currently or in the past; 6% being in the process of adopting an ECMS; and 35% having never adopted an ECMS. Of those vineyard organizations who had ever adopted an ECMS, or were in the process of adopting an ECMS, 81% had adopted LIVE, 24% had adopted USDA Organic, and 18% had adopted Biodynamic; 23% of respondent organizations had adopted multiple ECMS.

Furthermore, demographic information supports the representative nature of the survey sample collected. In an industry dominated by small firms (FGR, 2015), the majority of respondents were small organizations, with 55% having 25 acres or less; 29% having 26 to 100 acres; 13% having 101 to 1,000 acres; and only 1% having over 1,000 acres. Another indicator of small size, 76% were staffed by 4 or less full-time employees; 18% were staffed by 5 to 24 full-time employees; and only 3% were staffed by 25 or more full-time employees. Also, the majority of respondents held management positions at the time of the survey, with 68% of total respondents being vineyard managers, 44% being vineyard owners, and 37% being winemakers; 47% of respondents held multiple positions in their vineyard organization.

Analysis: Competency scale consensus analyses. Responses to the scenario-based items on the survey provided measures for each organization on their level of consensus with other survey respondents regarding sustainable viticulture conventions in the industry. Data from this cultural consensus scale emerged from the survey as a participant-by-response matrix for each organization, which was then inverted into a response-by-participant matrix, with responses in the rows and participants in the columns (Romney et al., 1986; Weller, 2007). Although the CCM items were originally designed as 'sustainable' and 'unsustainable,' with two scale points added to facilitate participant's engagement with the survey questions (Weller, 2007). A binary form is required for consensus analyses, to best test the boundaries between "knowing" or "not knowing" about one's culture (Weller, 2007). The CCM data was thus recoded from the 4-point Likert scale into binary form, with "0" being substituted for responses of "1" or "2" for 'unsustainable' responses, and a "1" being substituted for responses of "3" or "4" for 'sustainable' responses (Weller, 2007).

I utilized the consensus analysis tool in UCINET to determine the level of agreement among included organizations regarding the meaning and practice of sustainability (Bernard, 2006; Keller & Loewenstein, 2011). In a consensus analysis, the ratio of the first eigenvalue to the second eigenvalue must be a minimum of 3:1 in order to indicate the existence of agreement regarding shared cultural meanings within the group being analyzed (Romney et al., 1986). The UCINET output also determined the first factor loading score for each respondent organization included in the analysis, which indicated their competency scores (Bernard, 2006; Weller, 2007). Cultural competence scores represents the proportion of the categorization conventions participants share with the group; a higher the competence score indicates that a participant is highly knowledgeable regarding the culture of the group (Keller & Loewenstein, 2011). Two other measures indicate good fit of the survey data to the model produced: zero negative competency scores and a mean proportion of "sustainable" responses of 50% (Weller, 2007). These measures would indicate that the survey design accurately represented the cultural meanings of the participating organizations, as the scenario items were designed to be pairs of 'unsustainable' (response coded "0") and 'sustainable' (response coded "1") versions of the same scenarios, and the average of 0 and 1 is 0.5. A negative

competency score indicates a lack of consensus among participants, indicating that those participants with negative competency scores belong to another cultural or sub-cultural group (Weller, 2007). In this case, negative competency scores would indicate that the CCM survey designed to measure consensus in one group would need to be redesigned (Weller, 2007).

I first analyzed consensus among the overall group of respondent organizations, with regard to the set of all scenario-items. I then analyzed the level of consensus among the overall group of respondent organizations with regard to the two sets of practice categories included in the survey: materials management and land management. These analyses determined whether the sub-groups of organizations that have adopted the same ECMS – Biodynamic, LIVE, or Organic – shared agreement regarding how to categorize scenario-items by practice category.

I also compared the average competency scores of organizations with various ECMS statuses to determine whether an ECMS is associated with the alignment of sustainability meanings among adopting organizations. In a CCM design, the higher the average competency score among a sub-group of organizations, the greater the alignment between the cultural knowledge of those organizations with the overarching culture of the industry. Thus, the higher the average competency score is among organizations that have adopted the same ECMS, the more these organizations share concrete interpretations of sustainability.

Lastly, I compared how sub-groups of organizations, according to ECMS type, categorized materials management and land management practices with regard to being sustainable or unsustainable. I first recoded the response matrix to make 'sustainable' answers be represented by "1" and 'unsustainable' answers by "-1," which would make 'sustainable' categorizations to tend toward a positive direction and 'unsustainable' categorizations toward a negative direction. I then weighted the recoded response patterns of each respondent with their respective competency score, and calculated the average categorization convention scores across practice categories, overall as well as divided by ECMS type. Average categorization convention scores that matched in direction (i.e., positive or negative) would indicate agreement among sub-groups of organizations regarding their patterns of categorization of scenario-items; in contrast,

scores that did not match in direction would indicate disagreement. All in all, this comparison of categorization convention scores permitted the investigation into potential nuances in patterns of responses among sub-groups of organizations.

Method: Second round of qualitative inquiry. As discussed in more detail in Chapter 4, the CCM survey analyses found that the adoption of an ECMS is associated with alignment among organizational-level understandings regarding sustainable viticulture conventions, in comparison to non-adopting organizations. The survey results thus demonstrate the existence of relationships between ECMS and organizational understandings of sustainability, but do not offer explanations regarding how and why these relationships emerged as they did. The second round of qualitative inquiry further explored these relationships, focusing on the mechanisms by which ECMS adoption could be associated with consensus surrounding sustainability conventions among organizations, as well as with different levels of cultural competencies regarding those conventions. The analysis of the LIVE archival documents then focused on the activities in which LIVE engaged over time to cultivate coherent definitions and applications of sustainability among adopting organizations.

Second round of interviews. During the second round of interviews, I conducted 21 additional semi-structured, in-depth interviews between June and December 2014 with selected survey respondents with varying locations, ECMS adoption statuses, and cultural competency scores. These additional interviews brought the total interviews collected and analyzed to 46 over the course of this dissertation, including: 24 interviews with Oregon vineyards with ECMS; 6 interviews with Oregon vineyards without ECMS; 6 interviews with Washington vineyards with ECMS; and 10 interviews with Washington vineyards without ECMS. The bias toward interviewing organizations with ECMS in this second round is consistent with the goal to build theory on how ECMS and adopting organizations interact culturally. As with the first round, these interviews took place over the telephone, and were recorded and transcribed, with informed consent obtained from each informant before starting the interview (Miles & Huberman, 1994). I compiled the total set of interview transcript files into an aggregate data set, and utilized ATLAS.ti to code the data emergently within each ECMS group in order to uncover grounded themes. For a list of questions asked in this second round of interviews, see Figure 3.

Archival data from ECMS – LIVE. From the findings of the survey, the LIVE organizatin itself became of interest to research in more depth, to gain deeper insight into how LIVE and LIVE member organizations interacted from a cultural perspective. Regarding archival data, I collected all documents available publicly on LIVE's website. These documents included board of director meeting minutes, newsletters, research presentations, press releases, annual reports, blogs, and news articles. The dates of documents ranged from 1999, the year LIVE was established, to 2014. In sum, 174 documents were collected and analyzed as a part of this phase of empirical research. Refer to Table 8 for a complete summary of the number of documents by type and year. As is typical in qualitative coding, I utilized ATLAS.ti to first generate codes that were based on terms, concepts, and language used in the archival data, to emergently identify activities in which LIVE engaged and values LIVE espoused (Gioia et al., 2012; Van Maanen, 1979). In the second round of coding I then grouped these terms and concepts into broader themes to create sub-categories by practice type; and then consolidated these sub-categories into overarching themes regarding the meanings LIVE consistently espoused over these 15 years of its life.

Figure 3: Interview Questions for Second Round of Interviews

1) Can you please confirm that you entered the following information on the survey?
    - Certification status
    - Location (state and American Viticultural Area (AVA))
    - Size
    - Type(s) of ECMS adopted
    - Participation in ECMS educational seminars
    - [*Characteristics xyz – as answered on survey*] et al.
2) In the survey, you indicated that you participate in [*sustainability practices – as answered on survey*].
        - How did your firm learn about [*those sustainability practices*]?
        - What steps did your firm take to begin utilizing [*those sustainability practices*]?
        - Has engaging in [those sustainability practices] influenced how you approach other aspects of your firm's everyday operations?
        - How easy or difficult was it to motivate other employees to engage in [*those sustainability practices*] on an everyday basis?
3) In the survey, you indicated that you perceive your industry peers to participate in [*sustainability practices – as answered on* survey].

- How does this influence the decisions of your own firm to engage in sustainable practices in general?
- How does this influence the decisions of your own firm to engage in [*those sustainability practices*] specifically?
- Do you perceive that your industry peers have become more engaged in sustainable operations since the rise of ECMS in your industry?

4) Where did [*characteristic xyz – as answered on survey*] come from? [*Prompt: How did your organization shape [characteristic xyz – as answered on survey]?*)
Suggest the following:
   - Certification
   - Peers
   - Industry trade association
   - University education
   - Founders of organization
   - Et al.
5) ***Ask only if have adopted an ECMS***
   a. How did the adoption of an ECMS guide the development of [*characteristic xyz – as answered on survey*]?
   b. Did you have [*characteristic xyz – as answered on survey*] before adopting the certification?
   c. [*Characteristic xyz – as answered on survey*] appears to be a common trend among others with certifications. Do you frequently talk to your peers about this aspect of your business?
6) ***Ask only if have adopted an ECMS***
   - Did you engage in sustainability practices before adopting the ECMS?
     - Or was it mostly after adoption that you started practicing sustainability?
   - Why were you motivated to adopt an ECMS?
   - What benefits do you see from adopting the ECMS in the way you operate your vineyard?
   - Describe 2 or 3 ways in which you have integrated ECMS practices into your operations.
   - Have you ever served on the board of directors of the ECMS? If so, what benefits do you see from serving in this position?
7) Overall, what is your perception of the effectiveness of ECMS adoption as a vehicle for firms to learn how to operate more sustainably?
   a. Do you think ECMS have increased awareness of sustainability as an important business issue in your industry?
   b. How do you think ECMS enhance a vineyard's ability to operate sustainably?
   c. How do you think ECMS impede a vineyard's ability to operate sustainably?

Table 8: Summary of Archival Documents Used in Analysis of LIVE

Doc type	***Annual report***		***BOD Meeting Minutes***		***LIVE Blog***		***News Article***		***Newsletter***		***Presentation***		***Press release***		
Year	**# docs**	**# codes**	**# docs**	**# codes**	**# docs**	**# codes**	**# docs**	**# codes**	**# docs**	**# codes**	**# docs**	**# codes**	**# docs**	**# codes**	***Total # docs***
1999	--	--	3	16	--	--	--	--	--	--	--	--	--	--	***3***
2000	--	--	5	38	--	--	--	--	--	--	--	--	--	--	***5***
2001	--	--	3	26	--	--	--	--	--	--	--	--	1	5	***4***
2002	--	--	5	63	--	--	--	--	--	--	--	--	--	--	***5***
2003	--	--	1	14	--	--	--	--	--	--	--	--	--	--	***1***
2004	--	--	5	51	--	--	--	--	--	--	--	--	--	--	***5***
2005	--	--	3	45	--	--	2	17	--	--	--	--	--	--	***5***
2006	--	--	8	93	--	--	--	--	--	--	--	--	1	6	***9***
2007	--	--	6	76	--	--	--	--	--	--	--	--	--	--	***6***
2008	--	--	5	56	1	2	2	14	3	30	--	--	--	--	***11***
2009	--	--	6	64	5	6	2	13	2	12	4	15	1	5	***20***
2010	--	--	7	82	8	7	--	--	1	6	3	9	1	1	***20***
2011	1	9	4	38	10	9	--	--	--	--	2	2	4	2	***21***
2012	1	15	5	47	9	6	--	--	--	--	--	--	--	--	***15***
2013	--	--	7	65	15	18	1	1	--	--	1	4	3	1	***27***
2014	1	14	--	--	15	13	--	--	--	--	--	--	1	6	***17***
Total # docs/ codes	**3**	**38**	**73**	**774**	**63**	**61**	**7**	**45**	**6**	**48**	**10**	**30**	**12**	**26**	***174***

Summary: Research Context and Methodological Approach

In summary, in this dissertation, I drew on a mixed methodological approach to examine how organizations in the Pacific Northwest wine industry understand and apply sustainability through the adoption of three types of ECMS. I collected data in three phases chronologically: I combined and analyzed sets of qualitative interview and archival data to both construct a CCM survey, and also explored the quantitative findings from the survey in more depth. I review the findings from these sets of empirical analyses in the following chapter.

Benefits of comparative, multi-level study for organizational culture research. There are benefits to conducting a cultural study among multiple groups of organizations and levels of analysis. Primarily, collecting and analyzing interview and survey data from multiple organizations permits the generation of more generalizable findings, which has been lacking in cultural studies (Martin, 2002; Weber, 2005). Particularly as previous organizational culture theories emphasized the emergent nature of culture through interactions, prior studies in this area have relied on qualitative approaches to collecting and analyzing organizational cultures in order to gain deep insight into cultural processes (Martin, 2002). Although such an approach was necessary for studying emergent processes, scholars have lamented that such findings cannot be generalized outside of the organizations studied, and that incorporating quantitative methods into cultural research may help resolve this issue (Weber, 2005; Weber & Dacin, 2011). With the introduction of the repertoire perspective of culture, scholars agree that conceptualizing culture as being composed of cultural resources permits both the measurement and comparison of cultural elements within and among organizations (Weber, 2005; Weber & Dacin, 2011). In this dissertation, I thus use a combination of qualitative and quantitative methods to study aspects of organizational culture across multiple organizations and levels of analysis, permitting the potential to compare findings between organizations and industries.

CHAPTER IV

FINDINGS

In this chapter, I review the findings that emerged from the analyses of the quantitative CCM survey and the accompanying qualitative interview and archival data sets. Emerging from these analyses are two overarching sets of findings that provide noteworthy contributions to management theory. First, from the CCM survey, I find that there indeed is consensus surrounding the meaning and practice of sustainability across the Pacific Northwest industry, and that this consensus is particularly strong among those organizations that have adopted an ECMS. I find that particular types of ECMS are more strongly associated with generating this consensus, namely those ECMS that provide detailed practice descriptions, demanding objectives to achieve and maintain, and industry specificity. Prime among these types of ECMS is LIVE, which exemplifies these three characteristics and demonstrates the strongest consensus and highest cultural competences among adopting organizations. Second, from interview and archival data, I find that LIVE and LIVE members are actively engaged in the exchange of cultural meanings and practices. I find that key activities and roles of LIVE and LIVE members facilitate the adaptation and exchange of existing cultural meanings and practices, as well as the generation of new cultural meanings and practices, within the collective repertoire.

CCM Analyses: Strong Consensus Associated with ECMS

In this section, I first present the findings from the consensus analyses resulting from the quantitative survey data collected. I then present the findings from the follow up round of qualitative analyses to investigate the survey findings in more depth.

CCM survey findings. Overall, the CCM survey finds differences in how organizations understand sustainability among ECMS adopters and non-adopters, as well as nuanced patterns of understanding among groups of ECMS adopters. These findings demonstrate that ECMS programs are associated with alignment among adopting organizations surrounding meanings and practices surrounding sustainability in an industry. Analyses of the survey data showed evidence of unified cultural knowledge in the Pacific Northwest wine industry regarding the meaning and practice of sustainability. In addition, I find that organizations that have adopted an ECMS have above average

competencies regarding the unified culture of sustainability; and that those organizations that have adopted ECMS programs with the most demanding and detailed requirements – Biodynamic and L.I.V.E – have the highest average competency scores out of any other sub-group of organizations.

Overarching culture regarding sustainability. The results of the consensus analyses provide evidence of unified cultural knowledge regarding the meaning and practice of sustainability among organizations in the Pacific Northwest wine industry. The consensus analysis of all scenario-items generated a ratio of the eigenvalues for the first factor to second factor of 5.36:1, which is higher than the 3:1 criterion, with no negative competency scores. For the consensus analyses within the materials management and land management practice categories, the ratios of the eigenvalues for the first factor to second factor are both above the 3:1 criterion ($R_{Materials} = 4.86$; $R_{Land} = 3.80$), with no negative competency scores. For consensus analyses results, see Table 9. Overall, the proportion of 'sustainable' answers to the scenario-items is 51%, which indicates a culturally-representative survey design. All in all, the results of the consensus analyses indicate a good fit to the model of a unified culture surrounding sustainability in this industry, rather than a collection of subcultures. The finding of a unified culture means that organizations across the Pacific Northwest wine industry share specific understandings regarding sustainability.

Adoption of ECMS associated with higher average competency scores regarding sustainability. Comparing average competency scores between sub-groups of organizations with various ECMS adoption statuses, I find that organizations that have adopted an ECMS have higher competency scores, on average, regarding sustainability meanings and practices, than do those organizations that have not adopted an ECMS. Note that some organizations have adopted multiple ECMS. For a list of average competency scores overall and by ECMS type, see Table 10. Overall, the average competency score is 0.568, with the average competency score for organizations with an ECMS being 0.604, a difference that is significant at 95% confidence ($p = 0.048$). This significant difference demonstrates that ECMS adoption is associated with above average cultural knowledge regarding sustainability in this industry. In contrast, the average competency score for organizations without an ECMS is 0.503, a difference that is also

significant at 95% confidence ($p = 0.046$). This significant difference demonstrates that the lack of an ECMS is associated with below average cultural knowledge regarding sustainability in this industry. Note, I did not consider time since adoption in these competence analyses; just whether or not an organization had adopted an ECMS. Notably, I find that organizations with the Biodynamic or LIVE certifications have the highest average competency scores out of any other sub-group of organizations. Biodynamic organizations have an average competency score of 0.630, with a median score of 0.613; similarly, LIVE organizations have an average competency score of 0.620, with a median score of 0.644. These average competency scores are above the overall average competency score of 0.568, with the average competency score for LIVE being significantly different from the overall mean at 95% confidence ($p = 0.018$). These competency scores for LIVE and Biodynamic are also above the average competency score of organizations holding an Organic certification, which is 0.590, though this difference is not significant. These differences between the average competency scores of these sub-groups suggest that, although there is broad agreement regarding sustainability meanings at the industry-level, there are patterned nuances in understandings of sustainability at the organizational level related to the particular ECMS adopted. I discuss these differences between ECMS below.

Nuanced patterns of understanding of sustainability according to ECMS adopted. To investigate the patterned nuances in organizational understandings of sustainability related to the particular ECMS adopted that emerged in the analysis of average competency scores, I compare categorization convention scores of scenario-items according to practice category and ECMS type. This analysis step determines the extent to which sub-groups of organizations with particular ECMS agreed or disagreed with one another regarding how to categorize sets of practices as sustainable or not. For the comparison of categorization convention scores by ECMS type, see Table 11. In general, I find that sub-groups of organizations with various ECMS adoption statuses matched in their categorization of materials management and land management practices as sustainable or unsustainable. As explained above, categorization convention scores weight the response patterns of each respondent with their respective competency score, which measures how aligned organizations' response patterns are to the overall group's

response pattern. Thus, 'sustainable' categorizations are weighted toward a positive direction (i.e., between 0 and 1), and 'unsustainable' categorizations toward a negative direction (i.e., between -1 and 0). Thus, the closer the number is to 1 or -1, the stronger is the consensus. Within the materials management practice category, all sub-groups of organizations – regardless of ECMS adoption status, or type adopted – categorize similar patterns of scenario-items as sustainable ($CCS_{Materials\ Sustainable}$ = 0.199) or unsustainable ($CCS_{Materials\ Unsustainable} = -0.210$), on average. Within the land management category, all sub-groups of organizations – regardless of ECMS adoption status or type adopted – also categorize similar patterns of scenario-items as sustainable ($CCS_{Land\ Sustainable}$ = 0.207) or unsustainable ($CCS_{Land\ Unsustainable} = -0.050$), on average. However, within the land management practice category, Organic organizations do not match the other sub-groups in the categorization of unsustainable practices. Furthermore, the values of categorization convention scores vary among sub-groups, even when in the same direction. The results from this analysis provide further evidence of patterned nuances in the responses of sub-groups of organizations, primarily related to the type of ECMS adopted.

Qualitative inquiry into survey findings: Patterns of consensus around sustainability meanings within ECMS groups. For a deeper examination into the nature of the patterns of sustainability meanings within groupings of ECMS adopters as uncovered in the survey results, I revisited the compiled interview data from the first round of interviews, analyzing the data more closely. according to the four categories of organizations interviewed: LIVE, Biodynamic, Organic, or no ECMS. The results of this further analysis are summarized in Table 12.

Data analysis by ECMS group. Overall, I find that the two ECMS associated with the highest average competency scores – Biodynamic and LIVE – are the most detailed and rigorous out of the three ECMS programs available in the Pacific Northwest wine industry. Also, LIVE in particular was formulated specifically for this regional industry. In this way, these results demonstrate that ECMS programs with these three characteristics – detailed practices, rigorous oversight, and industry-specificity – are associated with aligned understandings and practices regarding sustainability in adopting organizations.

Table 9: Survey Items Weighted by Competency Scores, by ECMS Type

Measure	*All Items*	*Land Management Items*	*Materials Management Items*
N (# of respondents)	118	118	118
First factor	40.83	45.66	41.53
Second factor	7.62	9.83	10.92
First:Second factor ratio	5.36*	4.865*	3.803*
# Negative Competency Scores	0**	0**	0**
Yes answers (%)	51%	63%	42%

**Ratio is greater 3:1, which signifies consensus among group (Romney, Weller, and Batchelder, 1986), **Lack of negative competency scores indicates good fit of model to data (Weller, 2007)*

Table 10: Average Competency Scores, by ECMS Type

Group	*N*	*Mean Competency Score*	*Median Competency Score*	*Minimum Competency Score*	*Maximum Competency Score*
Overall	118	0.568	0.596	0.202	0.844
ECMS (Any)	76	0.604*	0.630	0.202	0.844
Biodynamic	13	0.630	0.613	0.392	0.813
LIVE	60	0.620*	0.644	0.202	0.844
Organic	18	0.590	0.601	0.203	0.754
No ECMS	42	0.503*	0.553	0.253	0.729
2-tailed t-tests for significant difference from overall mean: * $p < 0.05$					

Table 11: Similarities and Differences in the Categorization of Practice Types, by ECMS Type

Overarching consensus	*Situation Types*	*Level*	*Any ECMS*	*No ECMS*	*Biodynamic*	*LIVE*	*Organic*	*Average*
Matching cultural conventions	Materials Management	Sustainable	0.199 (+)	0.210 (+)	0.156 (+)	0.187 (+)	0.188 (+)	0.188 (+)
		Unsustainable	-0.277 (-)	-0.162 (-)	-0.166 (-)	-0.244 (-)	-0.188 (-)	-0.207 (-)
	Land Management	Sustainable	0.194 (+)	0.192 (+)	0.211 (+)	0.196 (+)	0.243 (+)	0.207 (+)
		Unsustainable	-0.061 (-)	-0.044 (-)	-0.024 (-)	-0.069 (-)	0.050 (+)	-0.050 (-)

**Underlined number (0.00) denotes lack of matching cultural convention among groups.*

Table 12: Summary of Meanings and Practices of 'Sustainability' within ECMS Sub-groups

ECMS	*Understanding of sustainability*	*Key approaches to sustainability*	*Approach / Format*	*Summary of key practices applied*
LIVE	Sustainability as triple bottom line • Integrating environmental, social, and economic demands	• Minimal inputs • Systems thinking • Practical decision making • Proactive management	• Detailed guidelines for practices (i.e., checklists) • Educational seminars • Prohibited substances • Calendars to follow	• Use input needed for issue at hand, but only minimal amount • Plan practices in advance to avoid redundancy and waste • Keep close track of practices to help in planning future seasons
Biodynamic	Sustainability as healing • Taking out of the earth what you put into the earth	• Homeopathic remedies • "Hands on" management • Systems thinking	• Sets of values • Detailed guidelines for practices • Recipes for making inputs • Calendars to follow	• Make your own inputs, and use as minimally as possible • Do not use any off-farm inputs. • Use animals as part of vineyard eco-system
Organic	Sustainability as prohibitive • Avoiding non-organic compounds	• Practical decision making	• List of prohibited substances	• Use only materials that are made from organically-based compounds
No ECMS	Sustainability as flexibility • Maintaining flexibility in operations	• Minimal inputs • Practical decision making	(Not applicable)	• Stay flexible on types of materials can use in case of issue • Produce crop for buyers

LIVE. LIVE is one of ECMS associated with the highest-average competency scores regarding sustainability among organizations, as well as the ECMS with significantly different average competency scores from the overall mean. Upon further qualitative analysis, I found that LIVE is one of the most demanding of the ECMS available to vineyard organizations in the Pacific Northwest. Organizations that adopt LIVE are provided with a checklist of detailed practices that they are required to follow. After implementing the required changes in their vineyard, organizations must maintain these practices for three years in order to qualify for formal LIVE certification, at which time the organization pays the required fees and becomes a formal member. At all times during and after the certification process, members are encouraged to attend educational seminars hosted by LIVE, in which viticulture experts discuss 'sustainable viticultural practices' regarding topics such as proper chemical use or calibration of pesticide spraying equipment.

Interview data shows that LIVE organizations shared a strong understanding of sustainability as a triple bottom line approach to vineyard management, describing practices that attended to both the demands of fulfilling contracts with customers, while minimizing the inputs used in the farming of the land as much as could be realistic. A LIVE organization expressed:

> I think the whole idea of how we refer to sustainability here … [is] a triple bottom line kind of idea where you're talking about environmental work and taking good care of your farm environmentally, but also a social aspect to it, and also an economic aspect of it. And you've got to have all three of those in order for a company to really be able to sustain itself (Interview, October 2013)

LIVE organizations differ from Biodynamic organizations in that Biodynamic organizations express the desire to first and foremost mitigate harm to the environment and then attend to customer concerns, whereas LIVE organizations take a more clearly balanced approach – that first and foremost the vineyard is a business with customers to attend to, and that the minimization of harm to the environment is a vital input to growing quality grapes, and thus to staying in business over the long-term. LIVE organizations also differ from Organic organizations in this sense – with Organic organizations being primarily concerned with materials management in a business, and LIVE organizations concerned with a big-picture approach to running a sustainable business.

Biodynamic. Biodynamic is the other ECMS associated with the highest-average competency scores regarding sustainability among organizations. Like LIVE, Biodynamic is detailed and rigorous in its practice requirements and oversight. Biodynamic organizations express a shared understanding of sustainability as "healing" the earth through "homeopathic remedies," and that long-term sustainability is achieved by creating a healthy, balanced eco-system on the farm property. Biodynamic organizations express that through the production of their own inputs – fertilizers, soil treatments, and pest and disease treatments – they do not introduce any foreign substance that could interfere with the natural processes on their properties that occur during grape growing:

> If you're going to be a Biodynamic farmer, you have to not just put on the [Biodynamic] preparations, you've also got to have cows, and you have to be self-sustaining on your site. I mean, basically off the grid. … If you're truly going to be Biodynamic, you've got to embrace it in its entirety (Interview, August 2013)

Biodynamic organizations aver that all other forms of farming harm the earth through the use of manmade and off-farm produced inputs. Biodynamic organizations must adhere to detailed practices and calendars, requiring vineyard managers to plan and develop specific knowledge.

Organic. Organizations with the Organic certification have lower competency scores regarding shared sustainability meanings, on average, as compared to organizations with the LIVE or Biodynamic certifications. Organic organizations describe their understanding of sustainability in very broad terms, focusing on the importance of utilizing only substances made from organic compounds to use in vineyard management. Informants explain that the Organic program functions more as a prohibitive list rather than as a guiding ideology:

> [When] I think of Organic … I just think about really limiting the amount of potentially harmful chemicals that you can use in the process of farming (Interview, August 2013)

This perspective of sustainability expressed by organizations with Organic certifications is unlike that expressed by either Biodynamic or LIVE organizations. In fact, the reliance on organic compounds is a point of contention between Organic and LIVE organizations, with LIVE promoting the rotation of various chemicals, organic or synthetic, to avoid the building of resistance by invasive weeds and plant species that could harm a grape crop.

No ECMS. On average, non-certified organizations have below-average competency scores regarding shared meanings of sustainability, that are significantly different from the overall mean. Non-certified organizations also have average competency scores far below those of LIVE, Biodynamic, and Organic. Non-certified organizations express more variation in their responses regarding definitions of sustainability, with the strongest emergent theme being that it is vital to maintain flexibility in vineyard management. For example, a vineyard manager at a non-certified vineyard stated with regard to certification programs:

> Some of the concepts are great, but there's just too many things that become nonsensical that the rules are rigid rules with – there's no logic or science involved in them. … They're going after the low-hanging fruit, and the fruit of little value in many ways. (Interview, August 2013)

Non-certified organizations find it important to be able to choose appropriate practices to implement for the profitability of the organization in the short- and long-terms, placing more emphasis on economic viability than environmental or social concerns of managing a vineyard. While these descriptions of sustainability are close to a triple bottom line approach, as is strongly expressed in organizations with the LIVE certification, non-certified organizations generally express a clear prioritization of economic concerns over environmental concerns.

More rigorous, detailed ECMS associated with higher average cultural competencies. These initial findings from the survey indicate that certain ECMS programs generate high cultural competency scores and strong consensus among adopting organizations regarding sustainability meanings. Specifically, three characteristics about such ECMS, including LIVE and Biodynamic, emerged as having a strong influence on cultural consensus surrounding sustainability meanings among adopting organizations: their guidelines provide a high level of detail in practice descriptions, the ECMS sets demanding objectives to achieve and maintain, and aspects of the programs were formulated specific to the regional wine industry.

The LIVE and Biodynamic programs are very detailed in their description of the required practices and involve the whole farm in the certification process instead of just the vineyard area, much more so than the Organic program. The Biodynamic program requires ECMS adopters to manufacture most of the inputs used on their vineyard, as

well as follow a strict calendar regarding when to apply certain inputs. The LIVE program provides adopting organizations with detailed descriptions and checklists listing required practices, which organizations need to not only implement, but also document in order to pass an audit. One vineyard manager expressed that the detailed format of LIVE improves its effectiveness in aligning sustainability meanings among adopting organizations:

> There's a billion different check boxes that we have to fill out and make sure we're being a part of … over the totality of the farm. So I do think that it helped structure our perspective [of sustainability] a little bit more (Interview, August 2013)

In comparison, the Organic certification is primarily a list of prohibited materials rather than a detailed program of practices.

Organizations that have adopted Biodynamic or LIVE perceive their adopted ECMS as having rigorous oversight. Many LIVE and Biodynamic organizations expressed it can be "tough" to follow all required practices, given the situational constraints of your farm. One LIVE organization stated:

> When you have farms … planted wall-to-wall with orchards and/or vineyards, and you don't really have any room for the required sustainable – or biodiverse – areas. That's kind of been tough, because the [ECMS] says "That's what we're going to do, and we're not going to do anything different." So we're trying to lease some biodiversity areas around the valley to get that 5% (Interview, August 2013)

Thus, organizations with a Biodynamic or LIVE certification perceive their own adopted ECMS as having rigorous oversight.

Additionally, industry-specificity of ECMS practices emerged as a key characteristic associated with effectiveness of an ECMS program to align sustainability meanings and practices. Interestingly, the LIVE program is the only ECMS out of the three available in the Pacific Northwest that has been formulated specifically for the wine industry, thus industry-specificity is one characteristic on which LIVE and the Biodynamic program differ. However, many organizations, regardless of ECMS adoption status, perceived the industry-specificity of LIVE as being highly effective in framing sustainability meanings. The LIVE program involves multiple stakeholders, including viticulture experts, in the formulation of program requirements and practices in order to achieve a high level of specificity and accuracy in its practices regarding sustainable vineyard management. One vineyard manager interviewed discusses the

partnership between LIVE and one local university:

> [Oregon State University] has got a very good viticultural extension service, and in conjunction with [LIVE] … they offer the grounds or the classrooms, lots of different seminars, and talks, and demonstrations. … Definitely the research that is coming out of OSU and how practical that is to be applied, is pretty positive for the [wine] industry as a whole (Interview, August 2013)

The involvement of these stakeholders and customization of practices to the wine industry are factors that not only provide LIVE organizations with concrete practices that vineyard managers can implement without interpretation, but also connect the conceptualization of sustainability concretely to viticulture and the business of growing grapes. Thus, industry-specificity emerges as a key characteristic framing cultural meanings regarding sustainability through an ECMS program.

Summary of findings regarding patterns of sustainability understandings within ECMS groups. This analysis shows that more detailed, demanding, and industry-specific ECMS programs have a stronger association with the alignment of specific and tangible understandings of sustainability within and among organizations. These findings imply that different types of ECMS are more strongly associated than others with organizational alignment regarding sustainability understandings. It is important to note here that other aspects of LIVE could impact its association with strong consensus surrounding sustainability. For instance, consensus could be strengthened because joining LIVE avails organizations to networking opportunities that promote the sharing of information among member organizations, particularly as many LIVE members are small organizations and thus likely seek out networking opportunities for learning purposes. However, I did not have sufficient evidence in the qualitative data, nor were the appropriate questions asked in the survey, to conclude that there were primary drivers of consensus other than the three discussed above. As such, further research would be necessary to investigate potential other drivers of consensus.

Key Activities Engaged in by LIVE Support Exchange of Shared Cultural Meanings and Practices

The previous qualitative analyses and survey findings demonstrate evidence of LIVE being the most strongly associated with consensus among adopting organizations regarding the meaning and practice of sustainability. These findings motivate a deeper investigation of LIVE, to ascertain key roles and activities in which LIVE has engaged

over time to facilitate such consensus. To this end, I pursued a qualitative investigation of how LIVE has developed as a program over time, drawing on both interview and archival data for a period of 15 years, 1999 to 2014. I again drew on qualitative coding in Atlas.ti to analyze text documents for related codes and themes, using both my subjective judgment and prior theory as a guide.

The results of the qualitative coding analyses of the LIVE archival data and interviews illuminated key activities in which LIVE engages in order to support the three characteristics associated with the exchange of cultural meanings and practices between LIVE and LIVE members, and also between LIVE and LIVE scientific partners. Specifically, the qualitative coding analyses uncovered four primary activities engaged in by LIVE consistently over time, including: seeking out strategic partnerships inside and outside of the local wine industry; continually developing specific practice and reporting guidelines for members; maintaining an education mission regarding the definition and application of sustainability in the wine industry; and maintaining a focus on the Pacific Northwest region in its guidelines, activities, and partnerships. These activities associated with LIVE result in the both adaptation of existing meanings and practices, and the generation of new meanings and practices regarding sustainability with LIVE members, as well as the exchange of these meanings and practices with LIVE member organizations. See Table 13 for a summary of the analysis regarding these activities.

LIVE activity #1: Maintaining an educational mission regarding the certification and application of sustainability. One of the most important activities in which LIVE engaged since its inception was to pursue a mission based on sustainability education, extended not only to ECMS members, but also industry stakeholders. Members of LIVE Board of Directors (BOD) expressed that increasing attention to and action on sustainability in the wine industry was the primary goal of LIVE's existence in the marketplace, and thus a focus on educating industry stakeholders regarding the meaning and practice of sustainability must be LIVE's primary mission. The BOD discussed this goal in a meeting in 2006:

> The board discussed LIVE staying focused on education and letting someone else promote the program. [BOD Member] mentioned LIVE is a grower oriented organization and our focus needs to be on educating growers (LIVE BOD, June 2006)

Table 13: Summary of results from analysis of LIVE archival data & interviews: Key LIVE activities and roles

Code category	*Code category count*	*Category description*	*Category description count*	*Overarching theme*	*Total codes by theme*
Partner - contractors	1	LIVE seeks out partnerships with other parties to help develop & update practice & reporting guidelines	1	Seek out ***strategic partnerships*** for core & non-core activities	286
Partner - IOBC relationship	40	LIVE seeks out partnerships with other parties to help develop & update practice & reporting guidelines	144		
Partner - OR state government	1				
Partner - Universities	20				
Partner - WAWGG	4				
Partner program - Salmon Safe	50				
Partner - WAWGG	11				
Relationship with other ECMS	7				
Strategic partners	10				
Technical committee	1				
Partner - non-PacNW wine region	12	LIVE seeks out partnerships with other parties to help expand sustainability certification & practices	47		
Partner program - Vinea (WA)	32				
Partner - contractors	3	LIVE seeks out partnerships with other parties to help with inspection			
Partner - contractors	3	LIVE seeks out partnerships with other parties to help with related program (non-core) activities	94		
Partner - EPA	2				
Partner - OR state government	6				
Partner - OWB	24				
Partner - Universities	5				

Code category	*Code category count*	*Category description*	*Category description count*	*Overarching theme*	*Total codes by theme*
Partner program - Carbon Neutral Challenge	17				
Partner program - Food Alliance	5				
Partner program - OCSW	26				
Partner program - OVID	6				
Reporting	26	Change/update reporting procedures to reflect new research, new chemical products, pest issues, or member needs	26	Continually develop ***specific practice & reporting guidelines***	204
Guidelines update/development	142	Change/update required practices & program guidelines to reflect new research, new chemical products, pest issues, or member needs	142		
LIVE IT updates	9	Develop & implement online connectivity for members to access guidelines & input reporting	9		
Inspection	27	Monitor/update inspection procedures & contractors to streamline and clarify inspection process for members	27		
Education committee	2	LIVE formed a dedicated committee to develop & oversee educational mission	2	Maintains ***educational mission***	145

Code category	*Code category count*	*Category description*	*Category description count*	*Overarching theme*	*Total codes by theme*
Branding/logo	54	LIVE's focus is on branding of sustainability, not marketing of LIVE program; outsources marketing to organizations	54		
Education mission	24	LIVE's primary purpose & core activities are to educate wine industry stakeholders on definition & practices regarding sustainability	39		
Educating buyers	9				
Educating consumers	3				
Educating growers	3				
Educational seminars	21	One of LIVE's core activities is to develop & implement seminars to educate members on LIVE program & sustainability practices	21		
Goal to define sustainability for industry	29	One of LIVE's goals is to develop clear & cohesive definition of sustainability for wine industry	29		
Pac NW wine regions approaching LIVE	8	Expanding certification to new regions in Pacific Northwest	10	Maintains ***regional focus***	41
Pac NW vineyards & wineries approaching LIVE	2				
LIVE program structure updates	17	LIVE guidelines are developed & maintained for growing conditions & *terroir* of Pacific Northwest	17		
Recruiting new members	11	LIVE recruiting activities target vineyards and wineries in Pacific Northwest	11		
Founding	3	LIVE started in Pacific Northwest	3		

This goal was reaffirmed in a 2009 meeting:

> The discussion ensued about where the line should be drawn between what LIVE's mandate is and what OCSW's mandate is. [BOD Member #1] expressed the opinion that although LIVE should not pursue consumer marketing, that it should also not turn down an opportunity to talk about the program to anyone that wants to listen. However it was agreed that LIVE should explain that OCSW is the consumer marketing engine that drives the discussion of sustainability to the end consumer. [BOD Member #2] expressed the idea that tasting room materials can be considered support for the member and that this would not fall into the consumer marketing arena. The group discussed a process by which any gray areas of operations would be discussed with a consult with the current chair before proceeding (LIVE BOD, June 2009)

In this way, other activities often related to ECMS, such as marketing and branding, were identified as secondary goals and activities for LIVE, with education promoted as a key mission of LIVE consistently over time.

Over the 15 years analyzed, LIVE focused on education in two ways. First, LIVE focused on developing a definition of sustainability so that all industry stakeholders could both understand and communicate about sustainability in a shared, coherent way. This definition of sustainability was primarily developed by the LIVE BOD and regularly discussed in BOD meetings. The concern of the BOD was that without a coherent definition of the term 'sustainability,' neither attention to sustainability or traction on LIVE adoption would occur in the industry. This issue was discussed in a BOD meeting in 2007:

> A balance is to be struck with a common definition of sustainability, statement of shared principals between the certification organizations. The OWB is working on a messaging structure and a marketing plan…. Vinea expressed concerns around the word sustainable being overused in the marketplace (LIVE BOD, January 2007)

The definition settled upon is similar to a triple bottom line perspective, as discussed in prior sections in this dissertation:

> [LIVE member organizations] care about their relationship with the environment, about equitable treatment of employees, and the economic issues and conflicts that businesses face (LIVE Annual Report, 2011)

The definition was then disseminated through LIVE marketing materials, educational seminars, and press releases, as well as integrated into program guidelines and practices.

Second, LIVE expended time and resources on developing practices that exemplified this definition. In order to facilitate the implementation of LIVE practices at

vineyards across the Pacific Northwest, in 2002 the BOD allocated resources toward the development and implementation of an educational seminar series, which was implemented in 2006. The seminar was initially developed through a collaboration between LIVE, third party contractors, and university researchers. To further promote the understanding and implementation of sustainable practices at vineyards across the Pacific Northwest, the BOD permitted non-members – termed "potential LIVE members" to attend these educational seminars as well. This seminar series was held regularly, and at varying locations to facilitate attendance by members spread over large geographical spaces. As discussed at a BOD meeting, the goal of the seminars included:

> Educate growers on specifics; contrast between organic and LIVE, give members an idea of understanding the principals of LIVE, informing new growers to the educational specifics (LIVE BOD, 2008)

To help geographically- or time-limited members with attendance even more, in 2013 LIVE implemented access to the educational series online through its website. In these ways, LIVE fostered and sustained a focus on educating the Pacific Northwest wine industry regarding sustainability understandings and practices.

LIVE activity #2: Seeking out strategic partnerships inside and outside of the regional wine industry. From the year it was established, LIVE both sought out and developed strategic partnerships with other organizations. The majority of these partnerships were developed surrounding organizational activities that were not core to LIVE's mission of educating program members and industry stakeholders regarding sustainability. For instance, over time, LIVE has maintained that its primary mission was education, and that marketing was a secondary activity. In order to sustain a focus on education rather than marketing, LIVE has partnered with various other organizations whose primary focus was marketing. Such partnerships include the Oregon Certified Sustainable Wine (OCSW) program, run through the regional industry trade association, the Oregon Wine Board (OWB). The nature of the LIVE-OWB partnership was discussed in a BOD meeting in June 2006:

> [BOD Member #1] expressed there could be some really strong synergy between what the OWB and LIVE are doing. He reported the OWB has been making aggressive plans for research, education, and marketing. OWB has the intention of going forward with a strong sustainable element in its Brand Oregon efforts. "Oregon Certified Sustainable" tends to be a theme. [He] suggested the OWB can eventually carry the promotional side

> of sustainability and have LIVE function as the education and certification side of the industry (LIVE BOD, June 2006)

At a later date, LIVE did help start the OCSW and even applied for grants through the OWB for oversight of marketing projects. However, LIVE maintained a low-profile in the day-to-day development and distribution of marketing materials to industry stakeholders, instead entrusting much of those marketing activities to the OCSW, OWB, and other organizations.

Likewise, LIVE also partnered with other ECMS and industry trade associations in order to develop complementary program guidelines and/or inspection procedures. For instance, LIVE partnered with the Washington Association of Wine Grape Growers (WAWGG) to encourage the trade association to continue its efforts to develop. WAWGG had also been attempting to develop ECMS programs for the Washington wine industry, with which LIVE assisted by consulting on the development of guidelines and inspection procedures.

> [Board Member #1] presented WAWGG report, stating that [three BOD Members] met with [WAWGG] to finalize the integration of LIVE into the Vinewise workbook. Once this is completed, there will be a small group of conscientious growers chosen for a pilot program to work out any issues that may arise from the integration. [Board Member #2] will be meeting with members of WAWGG next week to discuss an integration plan as well as presenting the current winery certification plans (LIVE BOD, June 2008)

Through the strategic partnership with WAWGG, LIVE gained a foothold in Washington state and started certifying vineyards and wineries in Washington state in 2009. With LIVE's help, WAWGG decided to focus more on the development of sustainability best practices for the regional wine industry in Washington, and left certification issues to LIVE.

A few partnerships were also developed with organizations whose activities were central to LIVE's development as an ECMS in the wine industry. One of the most important partnerships that emerged was with Salmon Safe, another ECMS program prevalent throughout the Pacific Northwest whose primary mission is to develop and disseminate land management practices that keep pollutants from entering waterways. Salmon Safe has worked with LIVE from its inception to the present, being included in regular Board of Directors meetings, consulted for LIVE's marketing and branding activities, and asked for input regarding the development and updating of LIVE's land

management practices. At one of the first BOD meetings, the nature of the partnership was discussed and approved:

> Advantages identified for participants included market recognition and access to certain markets. [BOD Member #1] proposed Salmon Safe be accepted into LIVE certification. Cost of this needs to be determined. [Salmon Safe Member] said he and others would review the guidelines and if OK would move forward. … [BOD Member #2] made a motion to make the LIVE certification requirements include the Salmon Safe certification requirements. The motion read: Work to form an alliance to include the certification program with Salmon Safe. The motion was seconded by [BOD Member #3] and was approved (LIVE BOD, February 1999)

In a following meeting, LIVE and Salmon Safe formalized their partnership, discussing the integration of the Salmon Safe program into LIVE guidelines:

> [Salmon Safe Member] reviewed LIVE guidelines and found LIVE guidelines to have very high standards, exceeding Salmon Safe's. He said he thinks we are at a point to integrate the two programs. … There are logistics to work through but [Salmon Safe is] focusing on growers, they will refer growers to LIVE (LIVE BOD, February 2000)

Through this partnership, LIVE integrated many of Salmon Safe's land management practices into their own guidelines, which served two purposes: first, LIVE learned through an established ECMS regarding appropriate land management practices for farms in the Pacific Northwest; second, the overlapping practices permitted all LIVE certified members to easily qualify for a Salmon Safe certification as well.

LIVE also developed and updated program guidelines through partnerships with viticulture and enology researchers at local universities, such as Oregon State University (OSU) and Washington State University (WSU). In line with its core educational mission, LIVE partnered with these universities in order to develop guidelines based on recent viticulture and enology research. LIVE then relied on researchers from OSU and WSU to educate members and industry stakeholders regarding how to implement these practices, and importantly to explain the research behind the guidelines. In one such project, LIVE worked with OSU to develop a chemical analysis tool that would allow vineyards and wineries to assess the toxicity and effects of using a particular substance:

> [OSU] is creating a chemical tool. [OSU] is also conducting a chemistry review including a winery survey for quantitative data on chemical use (LIVE BOD, June 2011)

The LIVE BOD decided to pursue the development of the chemical evaluation tool with OSU:

> The committee received the [OSU] chemical evaluation tool and believes the next step is to acquire funding for … an environmental researcher, to take what [OSU] has done and move forward with its application to the winery program (LIVE BOD, January 2012)

LIVE worked with the environmental researcher and OSU to develop a chemical evaluation tool that would be tailored for wineries, as reported in a BOD meeting:

> [The environmental researcher] has proved invaluable and worthy of the expense. The committee is using the information toward the development of a new, more expansive tool for capturing and assessing chemical use. Members will have access to the tool as soon as this quarter (LIVE BOD, February 2013)

In this way, LIVE drew on partnerships with universities to develop and disseminate coherent definitions regarding sustainability, based on research, which are activities supporting its core mission of educating industry stakeholders regarding sustainability.

LIVE activity #3: Continually developing specific practice and reporting guidelines for members. Related to partnerships with universities to develop guidelines, and as part of its educational mission, LIVE focused on continually developing specific and clear reporting guidelines for members. Guidelines development and reporting were regular topics in BOD meetings, and commonly involved invited input from university researchers and other ECMS, such as Salmon Safe (as mentioned above). For example, the involvement of industry partners in guidelines development was discussed in a 2008 BOD meeting:

> [BOD Member #1], [BOD Member #2], and [OSU viticulturist] agreed that the pesticide list needs improving and revising. [BOD Member #2] passed around charts with all registered pesticides in Oregon and explained that there is a model that is being developed that may be of use to LIVE for developing a more comprehensive strategy for adopting chemistries. … [BOD Member #2] asked about guidelines for forming a technical committee. [BOD Member #1] explained that there should be a cross-section of industry, extension service, and researchers. [BOD Member #4] said that Salmon-Safe should be contacted and that ODA (or equivalent) should be represented (LIVE BOD, August 2008)

As demonstrated, LIVE BOD members believed that better guidelines could be formulated if many perspectives from industry members were included.

Compliance with guidelines was an issue for LIVE management, but the BOD expressed that compliance would be easily met if members had clear instructions for the required practices they were both implementing and reporting on. To this end, the BOD

focused time, energy, and resources on developing specific guidelines, based on recent research in viticulture and enology, which would empower LIVE members to enact the required practices to the best of their ability.

> [BOD Member #1] stated that the LIVE Checklist was reviewed over a two-day period in February by a sub-committee, and changes were made that included expanding explanations and compliance instructions, re-wording vague or misleading language, and adjusting requirements to be more regional and realistic. … [BOD Member #2] raised issues with the vagueness of reporting requirements and [BOD Member #1] stated that this would be a bonus item and not required to pass. … [BOD Member #1] continued on to talk about resolving the variant language confusion, in that members could apply for variants in consecutive years if it was for a different pest on a different part of the vineyard, but it would have to be vetted through the technical committee and a decision would have to be made before allowing it (LIVE BOD, July 2007)

As discussed in BOD meetings, these efforts to create specificity and clarity around practice guidelines led to greater compliance and improved reporting on the part of members over time.

Furthermore, also keeping with LIVE's other key activities of maintaining an educational mission and developing strategic partnerships, LIVE worked toward the goal of continually updating the practice guidelines and reporting procedures. LIVE BOD members expressed in meetings that the purpose of this goal was to both keep the guidelines up to date with new research on vineyard and winery practices, but also change the guidelines with feedback from members regarding what was working and what was not working in their own use of the program. Continual improvement was stated as a primary goal of LIVE in its 2011 Annual Report:

> A new five-year plan was developed in 2011 so that smart growth, member support, and continuous improvement remain in the forefront. … LIVE will continue this reasoned struggle through technical and philosophical discussions as well as through continuous improvement of our standards and program requirements. As always, we are here to provide a certification of your efforts and will work to be as helpful and responsive as possible (LIVE Annual Report, 2011)

This goal was exemplified by the significant time and energy spent in BOD meetings to develop plans to invite outside researchers, soliciting other ECMS programs, and testing new chemicals (i.e., pesticides, herbicides, and fungicides) introduced to the market. To this end, LIVE released calls for volunteers in their newsletters, to recruit member

organizations to participate in the formation, development, and testing of updated LIVE guidelines:

> A Call for Involvement: LIVE is currently working on a number of projects aimed at addressing both administrative and membership needs. If you would like to be involved, we welcome volunteers and in-kind support. Listed below are some opportunities to help LIVE. *Winemakers:* As LIVE expands its services to winery certifications later this summer, we will be forming a winery technical committee to deal specifically with enology issues. Any interested parties please contact us (LIVE Newsletter, July 2008)

In these meetings, BOD members also planned for and implemented a move from a paper-based reporting system to an online reporting system intended to make the reporting process less time consuming and easier to use on the part of members, and more efficient in data collection for LIVE. In response to such continual improvements in specificity and clarity of practice and reporting guidelines, over time BOD members reported improved reporting and compliance from existing members, as well as a growth in the number of new LIVE members.

LIVE Activity #4: Maintaining a focus on region in guidelines, activities, and partnerships. Surrounding the three previously discussed key activities – seeking out strategic partnerships inside and outside of the local wine industry, continually developing specific practice and reporting guidelines for members, and maintaining an education mission regarding the definition and application of sustainability in the wine industry – has been the maintenance of a regional focus over time. Since LIVE's inception, the BOD members have continually made decisions to limit LIVE's reach to the Pacific Northwest region. This area primarily includes the states of Oregon and Washington, but has extended to parts of Idaho and British Columbia in Canada. Over time, LIVE has been approached by other regional wine industries, including New York and Virginia, as well as other ECMS, such as Certified California Sustainable Winegrowing (CCSW), to both develop new sustainability programs and act as a primary certifying agency for such programs. As discussed at length in BOD meetings, the BOD consistently decided against pursuing such direct roles in other regions or ECMS programs in order to focus on the wine region in the Pacific Northwest, both in resources and also in conceptual definitions of sustainability. The issue of whether and how to bound growth was debated in a 2010 BOD meeting, in which the BOD was deciding whether or not to include British Columbia (BC), Canada as a LIVE certifying region:

> [BOD Member #1] stated that LIVE started as more of an educational organization but turned into more of a presence in the marketplace. He is concerned that additional members would mean additional work for an already strained board. [BOD Member #1] asks what the point would be of expanding into PA and NY. He argues that LIVE stands to lose influence in the areas we are representing and inspecting unless there are energetic people behind these areas with a tech committee. [BOD Member #2] asks when are we going to put limits on where our expansion should end? From Willamette Valley to all of the Northwest. [BOD Member #2] asks 'What are the true benefits to growing?' (BOD Meeting, 2010)

The motion to expand into British Columbia was approved, but the BOD decided not to have LIVE act as a certifier in NY and PA, or any other wine region outside of the Pacific Northwest. As stated by the BOD:

> [BOD Member #3] states that BC is viewed as sustainable as well as our area, so joining with them and branching out with LIVE as a meaningful umbrella to help simplify all of the different certifications to streamline. NY doesn't have any certifiers and is untapped. [BOD Member #4] has spoken to representatives from NY and who have subsequently developed a workbook and has looked into getting state funds. [BOD Member #5] stated that LIVE could accredit, rather than certify vendors that the organization saw in line with its objectives and goals. He stated that Salmon-Safe and Oregon Tilth both have an accreditation model that could be adapted for LIVE. The board universally agreed that this would be beyond the scope of what LIVE is chartered to do (LIVE BOD, August 2010)

In subsequent meetings, the BOD decided LIVE would share materials with trade organizations in those industries, to assist them in setting up their own sustainability certifying group, but not actually certify vineyards and wineries outside of the Pacific Northwest.

These goals and decisions are in line with the educational mission of LIVE and leverage cultural understandings and practices specific to the Pacific Northwest history. Organizations in the Pacific Northwest already have a connection and understanding of LIVE practices because LIVE created such practices in a way that rang true to how viticulture and enology was practiced currently and in the past in this region. The region-specific focus has also supported the effort to make practice guidelines specific by being able to leverage the precise climate, *terroir*, and grape varietals grown in the Pacific Northwest, rather than a much more diverse set of conditions as are found in other wine regions. This attention to local climate and *terroir* is exemplified by the decision the LIVE BOD made to separate the Pacific Northwest into two growing regions:

> In January of 2009, the LIVE Vineyard Certification Technical Committee (VCTC) decided to create, based on climate, two distinct regions for its membership. … Each region has its own unique set of forms. … LIVE Region I describes cool-weather, maritime viticulutral climates. … LIVE Region II describes warm-weather, maritime viticultural climates. … Each region has its own pest- and climate-related issues that require unique attention (LIVE Blog, February 2009)

To this end, in conjunction with Salmon Safe, LIVE adopted the term "place-based sustainability," in which sustainability definitions and practices are tailored to a specific growing region, climate, and culture. BOD members often expressed that a coherent definition of sustainability and specific guidelines for members were necessary to facilitate compliance. Thus, the BOD realized that without a focus on the Pacific Northwest, sustainability definitions and guidelines developed by the ECMS would too become complex and abstract for members to understand and comply with, and thus impede LIVE's primary mission of educating wine industry stakeholders regarding shared understandings of sustainability.

Summary of LIVE's key activities facilitating exchange of shared meanings and practices. In sum, the analysis of the archival data uncovered four primary activities engaged in by LIVE consistently over time, including: seeking out strategic partnerships inside and outside of the local wine industry; continually developing specific practice and reporting guidelines for members; maintaining an education mission regarding the definition and application of sustainability in the wine industry; and maintaining a focus on the Pacific Northwest region in its guidelines, activities, and partnerships. These activities led to the continued generation, adaptation, and exchange of coherent definitions of sustainability in the Pacific Northwest wine industry, as well as the promotion of improved compliance and reporting on the part of LIVE members.

Interesting to note, my research uncovered a clear cultural element to the decision to maintain these activities over time that rests on the alignment of values between the LIVE BOD as a whole and its individual members. As the composition of the LIVE BOD shifted over time, the core activities of LIVE discussed above remained consistent. BOD members would select to remain on or exit from the BOD depending on how the outcome of decisions regarding these activities resonated with their own beliefs about what LIVE should stand for, and more broadly what sustainability should be. For instance, when asked about his decision to leave the BOD, one prior BOD member stated that his efforts

to shape what LIVE should stand for did not work out:

> When I first got on the board, I said, "You know, there's a marketing component to this, and we're a bunch of farmers that don't know the first thing about it." … That led me and another board member to build the Oregon Wine Board. … Certainly, the early Wine Board worked. … You do the marketing side and [LIVE] will do the certification side. … Then it fell apart in the transition [of] several Wine Board executive directors and several [LIVE] board of directors. It recently pitted out. That was when I decided to go off the board because I tried and I didn't get it done, and it's time for someone else. (Interview, May 2015)

Even with turnover of the board, and at times disagreements regarding LIVE's philosophy or required practices, BOD members discussed how the BOD has managed to maintain consistency in the four primary activities discussed above. Primarily, this consistency in actions is underpinned by a focus on LIVE's core values as promoting a triple-bottom line perspective of sustainability, with a balance between the three pillars of economic, environmental, and social goals. One BOD member stated:

> LIVE is out to promote its values to members, potential members. We also, as a board, do not set gross goals. We purposely avoid that idea, that we need to push. We do not like to compromise [LIVE's] values. The values come first and that's all the discussion of the board about that. Because of that, LIVE is not a very well known program out in the marketing world of wine sales. … [But] we are people who are more concerned about the rigor of the certification, the honesty of it, the transparency of it, the authenticity, collaboration. (Interview, May 2015)

Thus, although there are personal differences in how BOD members think about LIVE's role in promoting sustainability, or even how they define sustainability, the BOD has managed to consistently engage in four primary activities for the greater good of providing an ECMS that authentically and honestly promotes sustainability for its members.

CHAPTER V

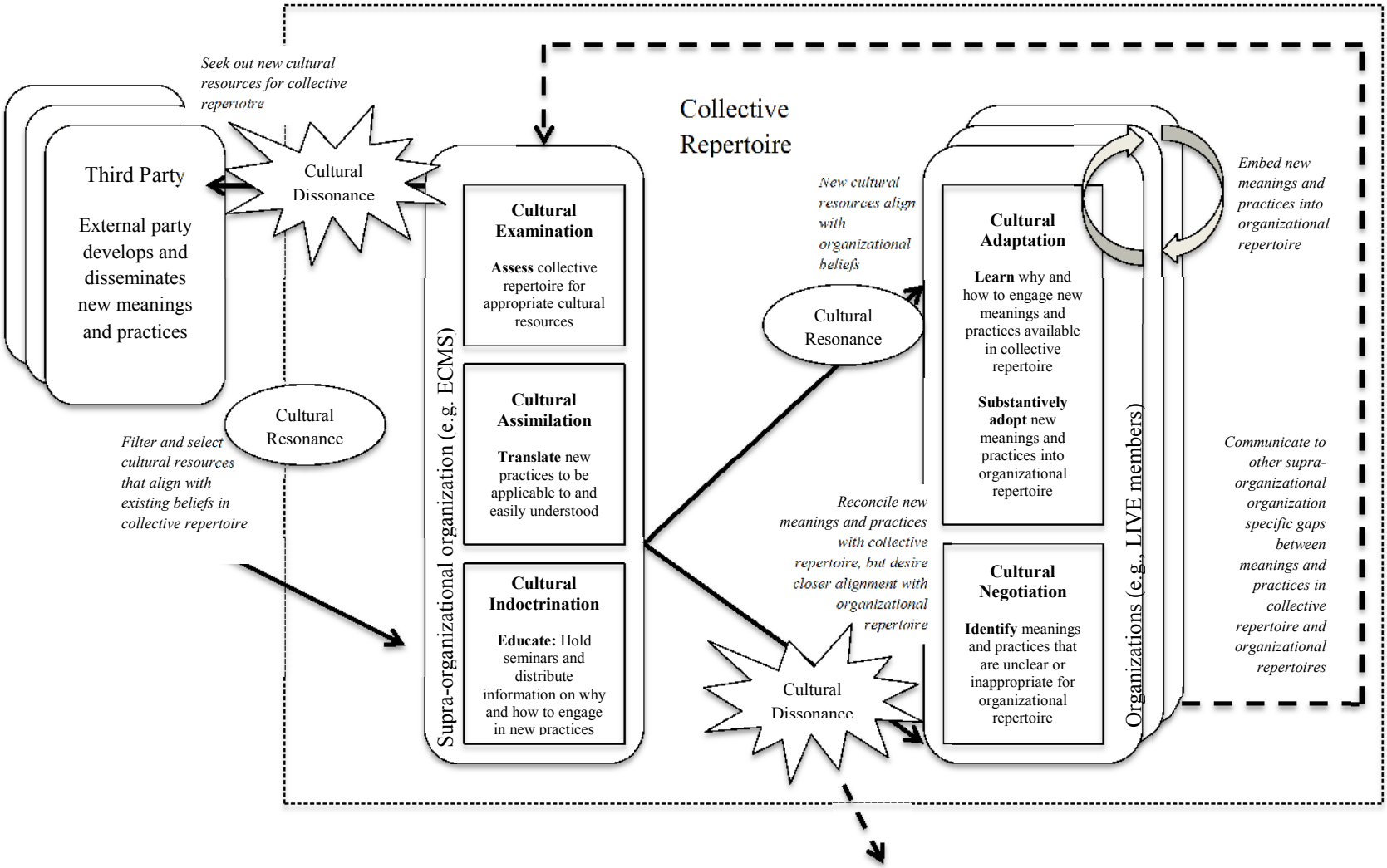
THEORETICAL DEVELOPMENT

The prior qualitative analyses of interview and archival data provide evidence of the generation, adaptation, and exchange of cultural meanings and practices among LIVE and LIVE members, as well as between LIVE and LIVE's scientific partners. The management literature lacks an explanation of such complex processes of cultural exchange among multiple organizations. Thus, this research motivates moving beyond a simple bidirectional and dyadic exchange relationship, in which one focal organization imports and exports cultural meanings and practices (Harrison & Corley, 2011). Grounded in the findings of this dissertation, I develop a conceptual model of cultural exchange that describes distinct roles that LIVE, LIVE members, and LIVE scientific partners fulfill, as well as mechanisms leveraged by each party to facilitate the exchange of cultural meanings and practices. This grounded model presents a more complex, intentional, and hierarchical view of cultural exchange than has previously been conceptualized in the management literature. In this section, I will first provide an overview of the grounded conceptual model. I will then discuss each mechanism involved in the exchange process of cultural meanings and practices between LIVE, LIVE members, and LIVE's scientific partners.

Overview of Grounded Conceptual Model

The grounded model of cultural exchange involves multiple organizations fulfilling distinct roles to engage in the intentional adaptation, generation, and exchange of cultural meanings and practices. Importantly, the exchange mechanisms in this model are presented as responsive and purpose-driven. Indeed, an intended contribution of this model is to describe an intentional exchange of cultural meanings and practices among multiple organizations. The model is visualized in Figure 4. The model involves three parties: the LIVE Board of Directors (henceforth, BOD), LIVE member organizations, and LIVE's scientific partners. The LIVE BOD and LIVE members share the same collective repertoire of meanings and practices regarding sustainability; however the LIVE scientific partners do not necessarily draw on this same collective repertoire. The collective repertoire is the existing meanings and practices regarding sustainability

Figure 4: Grounded Conceptual Model Describing Exchange of Meanings and Practices between LIVE and LIVE Members



available for LIVE and LIVE members to draw upon when conceptualizing and engaging in organizational activities.

Important to note, the model of cultural exchange developed here is *cultural*, in that it describes the process by which cultural resources are created, adapted, disseminated, incorporated, and negotiated by multiple organizations that draw on the shared collective repertoire. There are two concepts that are integral to this model as being cultural, rather than a more generic model of exchange such as organizational learning, capabilities, or technology diffusion. First, 'cultural resonance' is a term I use to describe when the cultural resources in the collective repertoire closely align with those existing in an organizational repertoire, or between organizational repertoires. In the model of cultural exchange, this resonance facilitates the exchange of meanings and practices because beliefs, values, assumptions, and practices in the collective repertoire are similarly understood, espoused, and enacted. This cultural resonance can mean that newly espoused beliefs espoused in one repertoire align with espoused beliefs in another repertoire, or that practices enacted in one repertoire align with practices enacted in another repertoire. Resonance can also indicate when espoused beliefs align with enacted practices, and vice versa. Second 'cultural dissonance,' is a term I use to describe when the cultural resources in the collective repertoire are disharmonious with those in an organizational repertoire. In the model of cultural exchange, this dissonance impedes, or at worst terminates, the exchange of meanings and practices because the beliefs, values, assumptions, and practices in the collective repertoire are dissimilarly understood or espoused. This cultural dissonance can mean that newly espoused beliefs espoused in one repertoire do not align with espoused beliefs in another repertoire, or when practices enacted in one repertoire do not align with practices enacted in another repertoire. Dissonance can also indicate when espoused beliefs do not align with enacted practices, and vice versa.

This emphasis on resonance and dissonance in the proposed model of cultural exchange makes this a uniquely cultural process because exchange relies on organizations engaged in the exchange experiencing resonance with beliefs and practices being exchanged. In this sense, the proposed model describes a motivation to engage in exchange in order to mutually adapt organizational and higher-order collective repertoires

with the dual aims to achieve cultural resonance and avoid cultural dissonance, rather than to exchange actions or capabilities for primarily strategic, competitive, or economic goals. I will now describe the mechanisms leveraged by each party in this model to facilitate the exchange of cultural meanings and practices.

LIVE Board of Directors: A cultural bridge. The LIVE BOD leverages three primary mechanisms to adapt existing and generate new meanings and practices surrounding sustainability, as well as share them with LIVE members.

Cultural examination: Assess collective repertoire and search for new meanings and practices that resonate. As discussed above, one of the key activities engaged in by the LIVE BOD is the continuous update of LIVE guidelines and practices, which LIVE maintains through internal review of the guidelines on a regular basis and partnerships with scientific researchers. In continually updating the guidelines, the BOD engages in an examination of the appropriateness of cultural meanings and practices in the existing collective repertoire for LIVE members to use in implementing sustainable practices. The LIVE BOD acts as at supra-organizational level to assess the collective repertoire for LIVE member organizations that draw on these shared meanings and practices. One LIVE BOD member emphasized this higher-order assessment activity as a primary role of the LIVE BOD:

> [The BOD] is the place where really all the decisions were made, … you're almost ordained to be on the board of directors. … It's always been the board of directors that really shaped … the essential paradigms of LIVE. … Everybody [in the BOD] thinks that sustainability is the three legs on a stool. That's the common idea – the social, the environmental, and the economic – and everything springs from there. … The board of directors is really there to make sure that the guiding principles are being followed, and as a group, those decisions are made several times to get the refined product (Interview, May 2015)

In this cultural examination, the LIVE BOD engages in three activities to identify cultural resources that resonate with the collective repertoire, or meanings and practices with 'cultural resonance.' First, the LIVE BOD can identify latent meanings and practices regarding sustainability that exist in the collective repertoire, but have not been implemented in the LIVE program. If these latent cultural resources resonate with the collective repertoire, the LIVE BOD draws them into use by integrating them into the LIVE guidelines. Second, the LIVE BOD can identify latent meanings and practices regarding sustainability that exist, but need adapting before clearly resonating with the

collective repertoire. Upon adaptation, the existing meanings and practices are then integrated into the LIVE guidelines. Third, the LIVE BOD can identify gaps in the existing meanings and practices, or 'cultural dissonance,' meaning that the collective repertoire lacks appropriate meanings and practices for the issues at hand. In this case, the LIVE BOD engages in a search for new cultural resources to incorporate into the collective repertoire to reconcile this dissonance between meanings and practices.

In generating new meanings and practices, the LIVE BOD draws on scientific knowledge provided by LIVE partners, such as university researchers, other ECMS, and the regional Departments of Agriculture, to obtain new knowledge regarding sustainable practices seen as relevant to vineyards. Regarding the generation of new meanings and practices, one BOD member stated:

> What we try to do is ask a member if there is a specific new problem that they've found in their vineyard and what they want to do about it. We look at that and then bounce that off of an extension down at Oregon State University. …We look at what is going on in the world and we come up with the least harmful, environmentally safe solution to that problem (Interview, May 2015)

From among this larger pool of scientific knowledge, the LIVE BOD chooses those beliefs and practices that resonate with the existing collective repertoire, determined by how closely aligned they are with LIVE's definition of sustainability as encompassing 'triple bottom line' values, and how reasonably incorporated they would be by vineyards inin the Pacific Northwest region. A LIVE BOD member expressed that the BOD heavily focuses on these two conditions when deciding what new scientific information to integrate into the guidelines:

> Real thought is being put into issues and we're creating rules that members will follow that are not only sustainable, but they're practical, they can be accomplished. We do a lot of self-assessing like that. … We're paying real good attention to what researchers are telling us. … We can't follow rules just blindly that aren't taking all those things into consideration, all those different environmental setups. … If we balance [creating sensible standards] with the always scrutinizing ourselves, I think we'll always have a winning combination to be accomplishing the mission of LIVE (Interview, May 2015)

Importantly, the LIVE BOD engages in three of its key activities in examining the collective repertoire and selecting new meanings and practices with cultural resonance: leveraging partnerships, continuous development of detailed guidelines, and maintaining a regional focus. These activities facilitate the BOD's role as a cultural bridge in accessing and filtering new scientific knowledge deemed to resonate with LIVE's

mission, as well as appropriate to LIVE members. In sum, cultural examination is a mechanism by which discrepancies or gaps in the collective repertoire regarding beliefs and practices are reconciled by the LIVE BOD. The LIVE BOD first assesses the fit between beliefs and practices in the collective repertoire, and in the case of cultural dissonance then searches for new meanings and practices that do resonate with those in the existing collective repertoire.

Cultural assimilation: Translate meanings and practices to be applicable and easily understood. Once new meanings and practices that resonate with the collective repertoire are identified, the LIVE BOD engages in the adaptation of these new cultural resources for integration into the collective repertoire, and thus taken up by LIVE members. In cultural assimilation, the LIVE BOD enacts two of its key activities to engage in *translating* of new cultural resources to be more easily understood and implemented by LIVE members: continuous development of detailed guidelines and maintaining a regional focus. The mechanism of cultural assimilation facilitates the LIVE BOD's role in deciphering and interpreting new scientific knowledge to disseminate to LIVE members.

The LIVE BOD engages cultural assimilation by translating new cultural resources in two primary ways. First, the LIVE BOD adapts latent cultural meanings and practices already existing in the collective repertoire to be appropriate for and easily understood by LIVE members. The LIVE BOD engages in this adaptation by structuring (or restructuring) the practices and writing (or rewriting) the guidelines in a way that LIVE members will find useful, clear, and applicable to how they already farm. For instance, LIVE worked with Vinea, a sustainability group in the Washington state wine industry, to adapt and integrate some Vinea practices to the LIVE guidelines. In doing so, the LIVE BOD translated these existing sustainability practices to the LIVE guidelines in two sets: one for cold climate growers and one for warm weather growers. In this assimilation process, the LIVE BOD selectively chose particular practices to adapt, and others to leave as-is:

> LIVE will work with Vinea to explore how they might [adapt] the guidelines… [BOD Member] required a Vinea contact for the LIVE Technical Committee. The [pesticide list] should be developed separately for [Washington] vineyards. The main score sheet will remain the same (BOD Meeting Minutes, August, 2007)

Second, the LIVE BOD translates when deciphering and interpreting the information selected from scientific partners to be easily understood and adopted by LIVE members. In engaging in translating, the LIVE BOD primarily decodes and interprets the scientific knowledge it has selected from LIVE partners to shape detailed yet practical guidelines for LIVE members to adopt and implement. An important part of this translation process is crafting the language of the guidelines in a "how-to" manner, so as to be easily implemented by LIVE members. One BOD member stated that the role of the BOD as a translator of scientific knowledge into understandable language for members was more important than formulating the actual guidelines:

> [LIVE] focused less on the formulation of standards, but [rather] the translation of these very high scientific minds that created them to your average Oregon farmer (Interview, May 2015).

Another important factor in this translation process is adapting the guidelines to include specific practices that are most relevant and easily implemented in the *terroir* of the Pacific Northwest. One LIVE BOD member expressed the important role the BOD has as a translator:

> We have to take [scientific knowledge] and we have to translate it into our environment, our growing situation. We have to find ways to … have it make sense to what we're doing here in our own [the Pacific Northwest] environments (Interview, May 2015)

Through the intentional selection of latent existing practices, development of new practices, and writing (and rewriting) LIVE guidelines into understandable language, the BOD is able to translate existing practices and scientific knowledge regarding sustainable viticulture to LIVE members. In sum, cultural assimilation is a mechanism by which the LIVE BOD adapts and expands the collective repertoire by translating new cultural resources to resonate more clearly with the collective repertoire upon which LIVE members draw.

Cultural indoctrination: Educate LIVE members on new meanings and practices. Once new cultural resources are assimilated into the collective repertoire, the LIVE BOD engages in the cultural indoctrination of LIVE members through providing education regarding meanings and practices regarding sustainability that are newly available in the collective repertoire. In this way, the LIVE BOD enacts two of its key activities to engage in *educating*: maintaining an educational mission and continuous

development of detailed guidelines. These activities facilitate the BOD's role as an educator in disseminating and explaining sustainability meanings and practices to LIVE members. One LIVE BOD expressed the importance that education has in developing a knowledgeable membership of sustainable organizations:

> We went from being just a certifying agency to now focused on education and certification. … In LIVE, it's like let's not just look at what the media, what the general public thinks is good for the environment, let's look at where the actual impacts are happening… We can't have [our members] follow rules just blindly (Interview, May 2015)

The LIVE BOD engages in cultural indoctrination primarily through providing educational seminars to LIVE members to learn more about the scientific background of a practice and its implementation. A LIVE BOD member expressed this important aspect of the BOD:

> Where [the BOD] offers education with LIVE is to offer those who are interested in being able to have the answer when they're pressed by someone about how they handle spotted ring drosophila or brown marmorated stink bug or anything that they do in the vineyard – that they're following the LIVE rules on – there's the education pieces so that they can talk about it just as sensibly as we would in the [BOD] technical committee where the science is being discussed. That way people aren't just following stuff blindly, if they want to know what's the science behind what we offer (Interview, May 2015).

Aforementioned, the LIVE BOD emphasizes education of LIVE members in order to ensure substantive adoption of sustainability meanings and practices. As one BOD member stated:

> [LIVE is] truly a group that's working on trying to help decrease our footprint on the environment, produce healthy, quality crops – because it doesn't make any sense if, with everything we're doing to regulate ourselves, we end up with a really poor crop that doesn't do anything for the industry (Interview, May 2015)

The LIVE BOD also sees the development of detailed guidelines as being a key mechanism to educate LIVE members regarding adapted and new sustainability meanings and practices:

> The checklist is the main means to get our membership aware. … From a nuts and bolts standpoint, LIVE is there to give any information to that group as they need. … LIVE is out to promote its values to members. … A lot of people just sit back and watch and listen. You don't even know they're listening, but they are. … LIVE is a common ground. It's the launching pad of sustainability for people (Interview, May 2015)

In these ways, the LIVE BOD views education as a mechanism by which to motivate LIVE members to fully understand why adapted and new practices are relevant

to LIVE's sustainability definition, and also to facilitate the adoption of these adapted and new practices by LIVE members. Thus, the LIVE BOD engages in educating the LIVE members on the meanings and practices included in LIVE guidelines, to ensure that adapted and new practices are understood and easily adopted. In sum, cultural indoctrination is a mechanism by which the LIVE BOD disseminates cultural resources newly integrated into the collective repertoire by through educational activities. Interestingly, the cultural indoctrination mechanism also serves to legitimate these newly integrated meanings and practices as representing the sustainability philosophy espoused by LIVE.

LIVE Member organizations: Cultural adopters. LIVE member organizations leverage two primary mechanisms to adapt existing and generate new meanings and practices surrounding sustainability.

Cultural adaptation: Learn about and substantively adopt new meanings and practices. LIVE members engage in cultural adaptation when they incorporate new meanings and practices that the LIVE BOD has indoctrinated and legitimated. LIVE members are presented with adapted and new sustainability meanings and practices as supplied by the LIVE BOD. In *learning* about adapted and new sustainability meanings and practices, LIVE members are challenged to rethink how they understand and enact sustainability in their own organizational repertoires. The indoctrination by LIVE focuses on describing the philosophy of LIVE and explaining how LIVE members should enact the practices, but through the adoption mechanism LIVE members decide how they will think about sustainability, and how they will implement the required practices. LIVE members engage in the *adoption* of adapted and new meanings and practices that the LIVE BOD has carefully selected and translated for inclusion in the LIVE program.

LIVE members primarily learn about adapted and new sustainability meanings and practices through attendance at educational seminars hosted by LIVE, feedback from inspectors, and reading the newsletters and press releases sent out by the LIVE BOD. For instance, one vineyard manager expressed that attendance at LIVE meetings and seminars is a key facilitator of learning more about sustainable viticulture:

> I have seen in our growers that we buy from work with LIVE over the years, and … one thing that happens when they adopt LIVE is that they start going to the meetings. One of

> the first things they do is they learn good ideas about how to farm sustainably from LIVE and other wine growers. So, there's an educational aspect (Interview, July 2013)

Likewise, another vineyard manager expressed that feedback from LIVE inspectors has been a valuable way to learn about sustainable viticulture, both in meaning and practice:

> The idea of getting an inspection from a LIVE inspector was at the beginning a little bit intimidating, but I think it's a really valuable resource. So I learn something new every single time I have an inspection. It's not just that they're there trying to catch me doing something wrong. They're trying to educate. And I find that very valuable. Having somebody from outside come onto your farm … is in some other way agriculturally smart. It's great (Interview, August 2013)

Another vineyard manager stated that LIVE has taught him how to think about sustainability in a more coherent way, and that he uses this understanding to implement sustainable viticulture practices in his own vineyard:

> [LIVE] puts up a pesticide list. They've got the checklist that we do every single year to rate ourselves regarding farming practices. …[Sustainability] is what you want to embrace and what you need to understand before you embrace it. … I think that if I didn't have the understanding that I got from LIVE, I would be treating my vineyard more like a golf course really more than an environmental zone (Interview, August 2013)

In this way, LIVE members use the educational seminars and detailed guidelines supplied by LIVE as mechanisms by which to clearly understand what sustainability means, as well as how to implement those practices in their vineyard.

As adopters, LIVE members substantively adopt meanings and practices supplied by the LIVE BOD through the implementation of required practices, and adherence to program requirements. LIVE members are primarily challenged to adhere to LIVE guidelines through rigorous oversight of the LIVE organization, in the form of both inspections and program requirements. Regarding inspections as a driver of substantive adoption, one vineyard manager discussed how knowing that you are going to have a visit from a LIVE inspector at regular intervals is motivating for the LIVE members to integrate LIVE practices to their best ability. As one vineyard manager stated:

> I think, one of the important things about LIVE … is that it is third party certified. … We have somebody come in and inspect the vineyard. We have somebody look at our records. … We don't choose that person, and no, it's done routinely. And I really appreciate that. And I think that is a rare feature for some certification programs. Makes it more rigorous (Interview, August 2013)

As discussed above, LIVE members are given detailed guidelines that have been carefully selected and translated by the LIVE BOD to be applicable to and easily

understood, which motivates substantive implementation of LIVE practices. One vineyard manager discussed some substantive changes toward more sustainable operations that his organization made upon adopting the LIVE program:

> As far as our power and consumption of fuel – when we're delivering goods, waste products, garbage and recycling, all these things come into the fray. … We have done some changes, I mentioned fuel consumption. So we are self-distributed, … which means that we used to drive our orders from Bellingham area down to the Seattle area. Now we will … tell customers – even though it's not ideal – that we can't deliver to them because they are potentially the only customers that will take the wine. More than that, financially it's unreasonable for us to haul them down there, it's also wasteful in terms of the fuel consumption (Interview, September 2013)

Beyond specific guidelines, LIVE members are required to adhere to LIVE program rules that dictate the boundaries of when a LIVE member can implement practices on their own or when they need to ask for help or permission from LIVE to implement a practice. For instance, one vineyard manager discussed an experience in which his farm had to ask LIVE for permission to engage in a particular practice, which they were bound to do under the requirements of LIVE. The vineyard manager expressed that if his farm were not a LIVE member, they could have just implemented their preferred sustainability practices, but because they were a LIVE member, they had to implement practices that LIVE permitted:

> And there is the whole-farm requirement. … We have 10 acres that we have just done an oak forest restoration on with the help of the USDA. And we had to do it very carefully because it is part of the farm. And in terms of the chemicals we used, when they went in to take out some Scotch Broom and some of the blackberries and so forth, we had to get permission from LIVE to do this. So it wasn't a problem, we explained to LIVE what we were doing and how it was going to be done, and it was quite a distance from the vines. And it was agreeable to them. But you do have to be very cognizant of these rules, and not just go off and use any chemical you want. So that was something I wouldn't have anticipated (Interview, August 2013)

Important to note, substantive adoption is facilitated by two of the LIVE BOD's key activities: developing detailed guidelines and maintaining an educational mission. The detailed guidelines permit LIVE members to adopt practices more readily, with educational seminars as tools if the guidelines are not sufficiently explanatory on their own. In sum, cultural adaptation is a mechanism by which LIVE members take up and integrate cultural resources newly integrated into the collective repertoire, thereby

adapting or expanding their organizational repertoires through learning about and adopting new meanings and practices.

Cultural negotiation: Inform LIVE on unclear, inappropriate, or missing meanings and practices. LIVE members engage in cultural negotiation when *informing* the LIVE BOD of meanings or practices that organizations feel are dissonant from or clash with their own organizational repertoires. Cultural resources with 'cultural dissonance' are those that are not easily understood or implemented, or that are members feel are missing from and should be included in the LIVE guidelines.

It is important to note that this can be a point of divergence in the cultural exchange process for LIVE organizations. If the new meanings and practices that LIVE is indoctrinating, and thus legitimating, closely resonate with an organization's cultural repertoire, the organization is likely to move forward with the adoption of the new practices. On the other hand, if an organization finds dissonance between their cultural beliefs and the new practices, the organization will be unlikely to adopt the new practices, and instead decide between two possible next steps. If an organization can see an opportunity for reconciliation of the dissonance the new cultural resources and the organizational repertoire, the organization will engage in cultural negotiation. If, however, an organization does not see an opportunity for reconciliation of the perceived cultural dissonance between LIVE and their organizational repertoire, the organization may choose to de-certify from LIVE, thus ending their role in the cultural exchange process. For instance, one vineyard manager said his organization dropped the LIVE certification when top management perceived dissonance regarding what sustainability meant, in belief and practice, between LIVE and their organization:

> The general manager and sales person – they both felt that it was [becoming] a marketing set. … I guess we didn't have the same focus [as LIVE], and we also increased our production, so I think that made it easier to source grapes if we were no longer worried about certification (Interview, August 2013)

LIVE members who choose instead to engage in cultural negotiation, identify dissonance between the meanings and practices that LIVE is indoctrinating and legitimating, and their own organizational repertoires, but see opportunity to reconcile this dissonance by working with LIVE. Specially, LIVE members identify gaps between what the guidelines specify and what is reasonable for the organizations to implement

both in terms of practices and beliefs, and then communicate these gaps to the LIVE BOD. An important part of this negotiation process is the communication from LIVE members to the LIVE BOD of the gap between intent and implementation. A LIVE BOD member stated that a primary event at which LIVE members can provide feedback on unclear or difficult practices is in the LIVE Technical Committee meetings, which occur monthly:

> The technical committee is made up of concerned [LIVE] members, ones who really want to get involved. … Generally, that's where the debate happens. … When it comes to hashing it out, it happens at the technical committee (Interview, May 2015)

Another important event at which LIVE members can provide feedback to the LIVE BOD is at the LIVE Annual Meetings, which occur once a year. One LIVE member recalled an experience at an Annual Meeting in which LIVE members voted on a potential requirement that could have been introduced to LIVE, but was voted down by the membership:

> A way for LIVE members to interact … with LIVE - important items have been brought to Annual Meetings. I remember we did a vote one year on GMOs [genetically-modified organisms], using GMO products in the vineyard. Everyone voted no. I mean every vineyard in attendance voted no (Interview, May 2015)

To facilitate this feedback mechanism, the LIVE BOD actively invites input from LIVE members, to aid in its goal of continuous improvement of the LIVE guidelines and program, to ensure they are applicable and relevant to LIVE members. In this regard, a LIVE BOD member stated that they welcome LIVE members to attend meetings in which guidelines are being discussed in order to better identify gaps or unclear language:

> We don't mandate things, there's thought process behind it, that's where the technical committee are always analyzing [the guidelines]. We invite anybody to be on the technical committee. … That's one of our underlying requirements, that anybody can show up at the tech committee and give opinionated feedback. What we find beneficial in [the LIVE board] is we don't just say we're sustainable because we do this, this, and this. … Let's look at where the actual impacts are happening, the [members] (Interview, May 2015)

Beyond feedback on existing practices, LIVE members also provide feedback to LIVE regarding practices they would like to see implemented as part of the LIVE program. A LIVE member attended a BOD meeting to express that he saw a lack of practices applicable to and appropriate for the warmer Washington state climate:

> [Vineyard manager] expressed there was some concern of how everything seems to be

> focused on Oregon, the guidelines and marketing efforts. He said the guidelines would need to be adapted for dry conditions in Eastern Washington. … [He] has concerns about several chemical-use issues (BOD Meeting Minutes, June 2007)

In these ways, LIVE members use the Technical Meetings and Annual Meetings to provide feedback to LIVE regarding practices that are unclear, inappropriate for their farm, as well any that might be missing according to their understanding of sustainability. In sum, cultural negotiation is a mechanism by which LIVE members reconcile dissonance they feel with cultural resources newly integrated into the collective repertoire. Through informing LIVE of this cultural dissonance, cultural negotiation is a key mechanism through which LIVE members engage in the mutual adaptation of the collective repertoire.

Summary of Grounded Conceptual Model and Boundary Conditions

In summary, the grounded model of cultural exchange provides a more complex understanding of how meanings and practices are created, adapted, disseminated, incorporated, and negotiated by multiple organizations that draw on the shared collective repertoire. The LIVE BOD serves as a cultural bridge, leveraging three mechanisms to examine and assimilate new sustainability meanings and practices that they perceive will resonate with the collective repertoire , and then indoctrinate LIVE members on why and how they should incorporate these new meanings and practices. The LIVE members serve as cultural adopters in leveraging two mechanisms to adapt the new sustainability meanings and practices into their organizational repertoires, as well as to negotiate with the LIVE BOD when the organizations perceive dissonance between the new meanings and practices and their organizational repertoires. An important aspect of this grounded model is this feedback loop that connects LIVE members' role of informing to the LIVE BOD's role in assessing the collective repertoire. With this communication from LIVE members, the LIVE BOD can continually engage in the examination of the collective repertoire, to either adapt existing practices by clarifying the language used in the guidelines or seek out and translate new scientific knowledge to fill the gaps. Thus, together, the LIVE BOD and LIVE members engage in a cultural exchange process to mutually adapt the collective repertoire regarding sustainability, which involves distinct roles, steps, and mechanisms. For further quotes exemplifying these roles and steps engaged in by the LIVE BOD and LIVE members, see Table 14.

Interesting to note upon discussing the model of cultural exchange between LIVE and LIVE members, is that the qualitative interview data portrayed the LIVE program in a very positive light. Although there were a few negative comments directed at LIVE by non-LIVE organizations interviewed, there were very few negative comments made regarding LIVE by LIVE member organizations interviewed. Indeed, most of the negative comments offered regarding LIVE were made by organizations who were no longer LIVE members, but had previously been certified by LIVE at one time. My qualitative content analyses reveal that this bias toward positive comments by current LIVE members can partially be explained by LIVE members' holding pro-environmental and pro-social values prior to adopting LIVE. The interview data uncovered that the motivation for many interview participants to adopt LIVE was a desire both to align with an ECMS that actively promoted a philosophy of sustainability that resonated with their own, and to learn about sustainability-oriented practices that represented that philosophy. Thus, any challenging required practices were seen as inconveniences rather than deal-breakers. For instance, when asked about an example of a practice or philosophy that they would prefer not to implement, a vineyard manager of a LIVE organization stated:

> It's nothing major. I mean, it's just like little things, like "Really?" … it's just the little stuff, it's stuff that maybe slows us down, like a quarter of a tick. But I mean, that kind of stuff that's not that big of a deal, but you're like "Ugh, I don't want to do this." I think all the reporting, like having to keep track of it all. You know, that type of stuff. I don't think it's anything too specific (Interview, September 2013)

When asked the same question, another vineyard manager of a LIVE organization stated that it can be challenging to implement required practices, but that balancing 'trade-offs' is a part of being sustainable:

> Are there practices that we prefer not to do but we have to do under these certifications? … In the LIVE vineyard – there are restrictions on certain herbicides. So we go through the vineyard a lot of times, you know, we have a ton of compaction issues, we have tractor blight, and associated problems. But it's a trade-off if you want to be sustainable. … [the practices are] not going to be ideal for everyone (Interview, October 2013)

In this sense, although LIVE is rigorous in compliance expectations and oversight, LIVE members are perhaps predisposed to think positively of LIVE as any negative perceptions might also reflect negatively on their own organization. For instance, the requirement to have 5% of land on your farm devoted as a natural area, or

"eco-zone," is a challenge for many LIVE members to meet, but the members see the challenge as pushing them to be truly sustainable, which aligns with their own organizational values rather than superficially sustainable. For example, when asked about challenging aspects of adopting LIVE, a vineyard manager stated that LIVE has changed his perspective from viewing sustainability as a challenge to a process by which organizations can achieve more honesty in aligning beliefs with practices:

> I wasn't even sure about sustainability about 6 or 8 years ago, and as I got into it, I started doing it more step by step, and you know, it's very much a process. And the more you do, the more you realize that it's not that difficult at all. … It's about being honest. But it hasn't been difficult to do it at all, to answer your question ... It's just another step or two for me. I think it will take some time to learn it, but I'm not intimidated by it. I think I can do it (Interview, October 2013)

Thus, to complain about LIVE's expectations would be akin to falsifying their own organizational culture as truly embodying sustainable values, and so LIVE organizations tend to accept and espouse LIVE's guiding philosophy and required practices.

Building on these findings, it is important to note some boundary conditions to the model. First, as I did not conduct in-depth analyses of Biodynamic, USDA Organic, or any other ECMS, I cannot generalize the model in its entirety beyond LIVE. Second, I cannot generalize the entirety of this model beyond the context of this study. This model describes the exchange of sustainability meanings and practices, not all cultural resources more generally, between a particular ECMS and its members in an agricultural industry composed of many small companies. As such, I cannot purport that this model reliably describes whether and how large companies, or companies in heavy manufacturing and service-based industries engage in cultural exchange. Per the repertoire perspective, collective repertoires differ among organizations and industries, thus the exchange process of cultural resources among organizations may be uniquely developed in various industry settings. Third, this study centered on a subset of cultural resources regarding sustainability, which is a pro-social, pro-environmental – and thus pro-common good – concept. As such, the small organizations in the wine industry might have been pre-disposed to engage in cultural exchange in the way described to mutually adapt the collective repertoire toward a clear goal that aligned with everyone's existing culture. Thus, this model of cultural exchange may not work – or might work differently – when taken into a context where there are few, large companies with heavy investment in fixed

assets and intellectual property to protect, or in which the goals of the organizations are not so closely aligned or unclear. Finally, and importantly, this study examined the exchange of cultural resources between multiple organizations and a supra-organizational organization – an ECMS. Thus, this study may generalize to other industries in which there is an organization at a higher-order level – such as a CMS, an industry working group, or a trade association – engaging in cultural exchange with multiple organizations. However, this model may not generalize to describe how organizations at the same level of analysis engage in the exchange of cultural resources.

Table 14: Quotes Demonstrating Mechanisms and Steps of Cultural Exchange between LIVE BOD and LIVE Members

Party & Role	Mechanism & Step	Exemplar Quotes
LIVE Board of Directors (BOD) *Cultural Brokers*	Cultural Exploration: Assess existing collective repertoire for cultural resources, or if need new resources	• [Marketing] is what some would say is a weak part of LIVE's program. I find it to be a strength that we offer a packaged amount of information that you in your winery can take and figure out … but we are not a group of marketers in the LIVE board. We are people who are more concerned about the rigor of the certification, the honesty of it, the transparency of it, the authenticity, collaboration. All of those things are important to us right now (Interview, May 2015) • [The LIVE BOD] is very involved with the research of the universities and the USDA research stations here in the Northwest, looking for data on soft pesticides, organic pesticides, regular synthetic pesticides with low environmental impact or sensitive species impact. … Working with universities, dovetailing their work and sifting through what's been done and how it applies to sustainability (Interview, May 2015) • There's no end game to sustainability if you take the most concrete, science-based, agro-ecology based [approach]. … We look to third parties to help us with that (Interview, May 2015)
	Cultural Assimilation: Translate existing or new practices to be applicable to and easily understood by LIVE Members	• [BOD Member] told the group of [requested] additions to the guidelines such as … adding a social responsibility element. He suggests they could focus on worker health and safety (BOD Meeting Minutes, May 2005 • We work with science-based information, papers, and training, weave them into the technical aspects of the program. … [We] try to make choices for [members] in that regard, knowing that new info has to be vetted a bit (Interview, May 2015
	Cultural Indoctrination: Educate through seminars and distribution of information on why and how to engage in practices	• The [LIVE] program is an educational, science-based program speaks for itself. It's not a marketing organization (Interview, May 2015) • [The LIVE BOD] talked about certification versus education in terms of sustainability practices. Our industry, and our board made the conscious decision to walk down the path of education, not certification (Interview, May 2015)
LIVE Member Organizations *Cultural Adopters*	Cultural Adaptation: Learn through attendance at seminars and reading of distributed information on why and how to engage in practices supplied by LIVE	• We learned about sustainable farming and the opportunities that LIVE offered compared to other environmental systems… It really comes down to a world view that works for your own personal philosophy [on sustainability] (Interview, August 2013) • The benefits with me [of LIVE], right now, are more education and networking. … I think, sustainability needs to be defined and real because a lot of people market it. And to have it be real it needs to be third party certified. So that's what draws me to the [LIVE] program. You have to be something different, you can't just talk about it or put it on the label and market it and take advantage of it. You have to do something, and I think that's an important part of sustainability is having the practices that you understand and make sense (Interview, August 2013)

Party & Role	Mechanism & Step	Exemplar Quotes
		• [A benefit of LIVE] is just being part of a community of like-minded people. You know, you always learn more when you've got more brains thinking at the same time. So they have educational seminars, and things like that, that I find useful. And just bouncing ideas off of peers (Interview, August 2013)
	Cultural Adaptation: Substantively adopt meanings and practices supplied by LIVE into organizational repertoire	• One thing we've changed since [adopting LIVE] … is to put more than one implement on the tractor at a time so you're not just mowing. You're mowing and doing something else at the same time. So you're eliminating a full pass through the vineyard (Interview, August 2013) • The other sustainable stuff… We have done some changes, like we have a large propane tank on site so we can fill our propane generator, our propane runs, forklifts, and the propane burners for oil at events and stuff, which again just saves us the commute to the refill 20-lbs propane tank (Interview, September 2013) • Another I think element of sustainability that we've implemented in the last – well I mean it's something that you work towards, right. It's not something that you just fundamentally change one day that you're going to be sustainable, or try to be more sustainable. It's a process, I don't think it's ever a finish line (Interview, August 2013)
	Cultural Negotiation: Identify and inform LIVe regarding meanings and practices that are unclear or inappropriate for organizational repertoire	• We have the technical committee, and that's the good thing I like about LIVE is that we write our own rules. That could become a greenwashing thing, "oh great you guys are a certification organization that is beholden to nobody." But it's really beholden to ourselves. We're lucky that we have a very good technical committee that makes sustainability a big and important part of what they do. … But at the same time, if something is ludicrous or doesn't work with the reality of making wine, then we can change that rule (Interview, July 2013) • [A LIVE member] explained that her personal desire is to farm sustainably, [and] that she would be more interested in the extension of education on sustainable practices to more vineyards (BOD Meeting Minutes, April 2002)

CHAPTER VI

DISCUSSION AND CONCLUSION

In this dissertation, I inductively investigated processes of cultural exchange among organizations and popular ECMS in the Pacific Northwest wine industry. The overarching research question of whether and how the adoption of an ECMS is related to how organizations understand and apply sustainability resulted in two stages of empirical research, with the second stage of research building on the findings from the first stage of research. The two sets of findings culminated in the development of a grounded conceptual model of cultural exchange, which describes mechanisms by which multiple organizations work together to create, adapt, disseminate, incorporate, and negotiate cultural meanings and practices. In this chapter, I discuss the contributions of these findings to theory, methods, and practice, review the limitations encountered during this research, and propose avenues for future research based on the findings of this dissertation.

Summary of Empirical Findings and Theoretical Development

I first investigated whether and how the adoption of an ECMS is related to how organizations understand and apply sustainability cultural conventions through the utilization of a mixed methodology called cultural consensus modeling (CCM). I investigated if and how the integration of standardized sustainability practices has bearing on meanings that guide everyday organizational action surrounding sustainability at multiple levels of analysis. Through the CCM survey, I found that organizations that have adopted standardized sustainability practices – operationalized by ECMS – indeed develop higher levels of competencies surrounding industry level sustainability conventions relative to non-adopting organizations. Through further qualitative inquiry, I found that particular characteristics of an ECMS are more strongly associated with higher cultural competencies regarding sustainability among adopting organizations. Regarding the process by which strong consensus and high competencies are formed, through qualitative investigation of interview and archival data, I found that organizations engage in cultural exchange with the ECMS LIVE, creating, adapting, disseminating, incorporating, and negotiating sustainability meanings and practices between LIVE and

LIVE member organizations. All in all, these two sets of empirical findings provide insight into how substantive adoption of ECMS practices is associated with greater alignment among adopting organizations regarding the cultural meaning and practice of sustainability.

Contributions to Theory, Methods, and Practice

In this section, I discuss the contributions of this dissertation's findings to theory, methods, and practice.

Theoretical contributions. The theoretical contributions of this dissertation include enhancing our understanding of culture as an open system, illuminating ways in which organizations understand and apply standardized cultural meanings and practices across multiple levels of analysis, integrating complementary theories of organizational culture, and providing insights into substantive adoption of ECMS in adopting organizations.

Contributions to organizational culture theory. This dissertation contributes to the organizational culture literature in several ways.

Culture as an open system. First, and most importantly, this dissertation builds on recent literature viewing culture as an 'open system' to theorize new perspectives on organizational culture. The grounded model developed in this dissertation involves the exchange of cultural meanings and practices among multiple organizations, which each have distinct roles and leverage distinct sets of mechanisms. This model introduces the notion that cultural exchange can be both intentional and hierarchical. Regarding intentionality, the model describes how multiple organizations at different levels of analysis purposefully examine the meanings and practices available in the collective repertoire, to assess resonance or dissonance between existing meanings and practices and their own organizational repertoires. In this way, organizations identify cultural dissonance in the collective repertoire through identifying where there are inappropriate or missing meanings and practices for a situation at hand. This dissonance creates a tension between what an organization wants to do and what it feels is culturally appropriate to do, and so the organization then engages in a negotiation with another organization, in this context an industry-level organization to resolve the dissonance. This effort to resolve the cultural dissonance motivates an intentional search for new cultural

meanings and practices that will resonate with the collective repertoire, and thus ease the tension. Also intentional, the model describes how organizations selectively choose only those new meanings and practices that they feel will resonate with the existing collective repertoire, filtering out new meanings and practices that do not resonate. Regarding hierarchy in this model, an industry-level organization inhabits a supra-organizational level, whereas the multiple other organizations engaged in exchange inherently inhabit the lower-order organizational level. The grounded model demonstrates that this hierarchy matters in that the industry-level organization is the party selecting and translating meanings and practices that are deemed to resonate with the collective repertoire. While the other organizations do have a role in providing feedback to the industry-level organization on the appropriateness and clarity of these meanings and practices, it is industry-level organization that controls the search for and selection of new meanings and practices. This hierarchical relationship between the industry-level organization and the multiple industry-member organizations in the exchange of cultural meanings and practices has not been discussed in prior literature, and suggests that one party in the cultural exchange holds more influence in shaping the collective repertoire.

As such, the model developed introduces the notion that various organizations in an industry – or across industries – can exchange shared meanings and practices within and across collective repertoires. Noting the boundary conditions of this model, the model may be best suited for analyzing cultural exchange in industries composed of small companies in which there is a higher-order, supra-organizational organization facilitating exchange. For instance, the model developed in this dissertation might be useful in understanding how industry level groups, such as industry working groups or trade associations, can intentionally engage with third party organizations and organizations alike to shape shared meanings and practices around a particular issue in the industry. This model also introduces the idea that organizations at any level can intentionally engage in the cultural exchange process through the mechanism of cultural negotiation, or by providing feedback to or becoming involved with industry level groups to help identify where cultural dissonance with meanings and practices still remain. Thus, overall, the grounded model could be abstracted to other industry settings in which the cultural exchange process can be used by organizations at various levels of analysis to

work together to intentionally shape the collective repertoire.

Furthermore, the grounded model builds on prior literature to describe cultural exchange process as more multi-faceted than has been previously conceptualized. The concept of cultural cultivation describes a bidirectional flow of resources between a focal organization and an external group (Harrison & Corley, 2011). As such, this model is highly simplistic, describing how one organization infuses new cultural resources into its repertoire, and seeds its own cultural resources into the external group. However, the model of cultural cultivation only focuses on this flow of resources, and does not address how the focal organization decides which cultural resources to infuse or seed, or how the external group understands and engages in the cultural exchange process. The grounded model developed in this dissertation does address these points, describing how organizations involved in a cultural exchange fulfill distinct roles, engage in distinct sets of mechanisms to facilitate exchange, and intentionally select meanings and practices appropriate for their context.

Additionally, the findings from this dissertation enhance our understanding of how standardized practices and codes are associated with organizational culture, across multiple organizations (Christmann & Taylor, 2006; Howard-Grenville et al., 2014; Lahneman, 2015; Stevens, 2007). Prior studies suggest the potential for standards or codes to impact everyday organizational action, linking corporate codes to employee behavior (Stevens, 2007). However this prior literature does not address how adopted standards that are developed at an industry level to address management issues faced by multiple organizations might be related to employees' understandings and behaviors surrounding the management issues in their own organization. This dissertation contributes to our greater understanding of how the integration of standardized practices required by ECMS adoption is associated with how organizations understand and apply sustainability conventions held at an industry level. Furthermore, prior literature has focused on the imposition of ECMS (or CMS more generally) on organizations by industry associations or other supra-organizational parties, which will often lead to symbolic adoption of the ECMS by the organizations (Terlaak, 2007). However, this dissertation demonstrates that organizations have more agency in the mutual adaptation of cultures, playing a much more active role in both the development of the ECMS and

the process by which they adopt the ECMS practices, as well as choose to substantively adopt the ECMS.

Overall, through the analysis of the findings and the development of the grounded conceptual model, this dissertation contributes to our deeper understanding of how organizational culture can act as an open system. The developed conceptual model has implications for future research in how we view organizational culture, suggesting that shared cultural meanings and practices do not only emerge from interactions within organizational boundaries, but instead are embedded in a system of higher-order cultural exchanges that dynamically shape the strategies of action taken up by organizational members. The model developed also has implications for how we understand the adaptation of existing cultural meanings and practices, as well as the generation of new cultural meanings and practices, suggesting that both industry and organizational repertoires can change in a deliberate, intentional fashion. This model purports to change how we view organizational cultures as being both unique and also sharing similarities, and that such similarities are intentionally sought out. This suggestion is interesting because we previously thought about organizational cultures as being unique (Schein, 1996; Smircich, 1983). The model of cultural exchange instead suggests that organizations intentionally seek out alignment with other organizations and external cultures, ostensibly regarding a specific issue that is salient to all, such as sustainability. In this way, the model proposed in this study not only provides insight into how organizational culture works as an open system, but also introduces the idea that within an open system organizations can intentionally strive to become more similar in some aspects. Interestingly, we lack studies on cultural similarity – and its motivations and consequences – because most research in culture focused on single organization case studies. By including multiple organizations in this study, I was able not only to uncover aspects of similarity between organizational cultures, but also illuminate how similarity can be achieved. Further research can thus build on this model to examine further how motivations behind and consequences of cultural similarity versus uniqueness. Thus, the grounded model developed in this study not only significantly alters our previous conceptions of organizational culture as a repertoire enacted primarily by individuals

within a collective, but also offers a perspective of cultural exchange as multi-faceted, intentional, and hierarchical.

Linking organizational culture and standardized practices. This dissertation also demonstrated through both quantitative and qualitative research that the cultural exchange found to be occurring between organizations and the ECMS LIVE was associated with increased agreement surrounding the meaning and practice of sustainability across many organizations in the Pacific Northwest. Widespread changes in organizational practices with regard to a particular issue can become an urgent matter for an industry as a whole, because a lack of response to a commonly-shared issue could lead to damaged reputations and adverse penalties from stakeholders for organizations across the industry (Barnett & King, 2008; King & Lenox, 2000). In the case of the wine industry, sustainability is an important issue because climate change is altering growing region for vineyards around the world, and thus threatening the long-term sustainability of vineyard and wine companies across the entire global wine industry (Resco et al., 2010). As seen in this paper, collective action is being pursued in various wine regions and countries to instigate deep-level changes in the way vineyard organizations understand and practice sustainable viticulture (Marshall et al., 2005).

Indeed, business sustainability is becoming an issue of particular concern for companies across diverse industries, yet many companies find it challenging to achieve deep-level, cultural changes in their organizations (Howard-Grenville et al., 2014; Waddock et al., 2002). At an industry level, industry associations are establishing working groups of companies in an effort to spark industry-wide change toward sustainability (King & Lenox, 2000; Levy & Kolk, 2002; Waddock et al., 2002). Yet, prior research demonstrates that often such collective efforts in an industry fall short of shaping deeper changes in the way organizations understand and act on salient issues (Terlaak, 2007). The reasons for these failures to instill deep-level cultural change are associated with the concept that organizations often adopt new practices only symbolically, partially integrating new practices to signal compliance to influential stakeholders (King & Lenox, 2000; Terlaak, 2007). This symbolic adoption approach permits an organization to obtain positive benefits from the new practices, such as a reputation boost from influential stakeholders, while minimizing costs associated with

practice changes and mitigating negative penalties from stakeholders, such as increased regulation or loss of customers (Terlaak, 2007).

As this dissertation demonstrates, through the substantive adoption of new practices, deeper-level changes in the way that organizations understand and practice sustainability is occurring among multiple organizations in the Pacific Northwest wine industry. Rather than focusing on creating guidelines and standards for organizations to follow, which could result in symbolic adoption only, the findings of this dissertation indicate that industry associations or collectives instead could focus on instigating cultural exchange among organizations. Future research would be needed to delineate the strategic implementation of cultural exchange in an industry, but this dissertation suggests that it could be a fruitful process to pursue if an industry group seeks to instigate large-scale change surrounding a particular issue, such as sustainability. By generating cultural exchange among many organizations, an industry group ostensibly could foster greater focus on a salient issue on part of organizations on salient issue that might affect industry as a whole, as well as generate coherent action around that issue.

Integrating theories of organizational culture. This dissertation also contributes to organizational culture theory by combining two theories of organizational culture that have developed in parallel: repertoire and consensus. As discussed in Chapter II, the integration of these two theories permits the measurement of how much individuals and organizations know about the resources available in their organizational and industry registers (Romney et al., 1986), in addition to how individuals and organizations actually use that knowledge in everyday organizational action (Swidler, 1986). To the best of this author's knowledge, these two theories of culture have not been combined in prior research; however, doing so permitted me to investigate processes involving the interaction of organizations across cultural groups, along with the ability identify and compare components of organizational cultures (Weber, 2005; Weber & Dacin, 2011). Furthermore, the combination of these theories requires the utilization of a mixed methods approach, which is uncommon in culture research, being typically qualitative. Such a combination of theories and methods facilitates further investigation of dynamic processes underlying the maintenance, change, and transfer of cultural resources by organizations across multiple levels of analysis, such as was attempted in this

dissertation. In this way, this dissertation serves as a model for combining two parallel, and complementary theories of organizational culture – culture as consensus and culture as repertoire – to gain insight into both knowledge and utilization of cultural resources.

Contributions to sustainability and ECMS literatures. This dissertation contributes to our greater understanding of processes involved in substantive adoption of ECMS, a topic largely absent from management literature. Aforementioned, prior research regarding ECMS has primarily focused on the role of symbolic adoption by adopting firms, demonstrating that firms may decouple adoption from practice (Howard et al., 1999). Symbolic adoption permits a firm to gain legitimacy and monetary resources by signaling compliance with stakeholders, while avoiding costs associated with the implementation of required practices (Alberti et al., 2000). Alternatively, this prior research has provided evidence that some firms couple adoption with practice, thereby engaging in substantive adoption (Christman & Taylor, 2006); as such, substantive adoption of an ECMS holds potential to have far reaching implications for changes in organizational practices toward sustainability. Overall, however, there remains a distinct lack of research investigating the processes involved in substantive adoption, as well as research investigating the outcomes of coupling adoption with practice.

Enhancing our understanding of ECMS characteristics contributing to substantive adoption. This dissertation investigated ECMS adoption in the Pacific Northwest wine industry, an industry in which three ECMS with varying formats and approaches have gained in popularity with vineyard organizations over the last few decades. Overall, the findings from this dissertation suggest that in addition to the function of ECMS as stakeholder-signaling tools, adopting organizations can utilize ECMS to align meanings and practices surrounding the otherwise imprecise issue of sustainability. The quantitative and qualitative findings of this dissertation complement one another in demonstrating that ECMS adoption is associated with above average cultural competency regarding shared industry-level meanings of sustainability.

ECMS as cultural alignment tools. The findings of this dissertation enhance our understanding of ECMS programs – and more broadly standardized practices – as potential mechanisms to align cultural meanings and practices regarding sustainability,

upon which organizations can draw to cultivate sustainability meanings and practices in a tangible way. Whereas prior research has emphasized how organizations often symbolically adopt ECMS as stakeholder-signaling devices, the findings of this dissertation suggest that organizations can also utilize ECMS as a tool with which to instigate deeper-level, cultural change toward establishing a more sustainable mindset on the part of organizational members. Relatedly, prior research in strategy on ECMS has focused on links to organizational outcomes, such as financial or sustainability performance, while lacking deeper investigation into the mechanisms by which ECMS are associated with these outcomes. As such, links between organizational culture and ECMS have not been investigated in any depth. Thus, more broadly, this dissertation demonstrates promise for researching ECMS adoption through the lens of organizational culture, in that the adoption of an ECMS can guide decision making and actions in everyday organizational life.

Methodological contributions. The primary methodological contribution of this dissertation centers on the application of a novel methodology in cultural anthropology to an organizational context. This dissertation utilized CCM, which offered the use of both qualitative and quantitative methodologies in order to measure and compare cultural components between cultural groups. Previously utilized primarily by anthropologists to study variation and cultural knowledge between such cultural groups as nationalities or tribes, the application of CCM to an organizational context permitted measurement and comparison of organizational cultural aspects, while remaining an inductive study and integrating insights gained from qualitative research (Bernard, 2006; Keller & Loewenstein, 2011). Thus, methodologically, this dissertation demonstrated the potential for CCM in permitting findings that offer both deep insight and generalizability in organizational cultural research.

Using mixed methods in organizational culture research. This dissertation utilized mixed methodologies, which allowed for comparison among multiple organizational cultural groups. In particular, this dissertation utilized CCM survey methodologies, which permitted the measurement of organizations' knowledge of widely held cultural conventions (Romney et al., 1986). In keeping with the conceptualization of culture as being emergent, prior research has emphasized qualitative methods and "thick

description" in order to gain deep insight into emergent, dynamic cultural processes (Martin, 2002). More recently, however, scholars have been calling for mixed methodological approaches to be taken in organizational culture research to be able to generate more generalizable findings (Martin, 2002; Weber, 2005). By utilizing a CCM approach, in this dissertation I both gained deep insight into cultural processes and generated comparative measurements between aspects of culture (Weller, 2007).

Measuring aspects of organizational culture. The utilization of CCM tools also permitted the identification and measurement of subcultural groups in an industry. Much prior research has conceptualized organizational culture as being a collective – or even monolithic – construct, and thus empirical studies have focused on assessing organizational cultures, or other cultural groups, as a whole (Martin, 2002). CCM provided a way to delineate boundaries between cultural groups using consensus modeling and factor analysis techniques, thus permitting the empirical study of both unified cultures and collections of subcultures within regional industries. As a methodological tool, CCM overcame the limitations in generalizability inherent in viewing organizational culture as 'monolithic' or only visible in interactions, as was emphasized in earlier theories regarding organizational culture. By permitting the identification of and comparison between cultural groups to provide more generalizable results, in this dissertation, CCM enhanced our understanding of how organizational culture can act as an open system, permitting organizations to flexibly draw on cultural resources related to sustainability across multiple levels of analysis. Finally and importantly, CCM permitted the distinction of symbolic adoption from substantive adoption of ECMS, which is an understudied and poorly understood area of management research. It did so by showing patterns of actual competencies and how those varied within populations of adopting organizations.

Contributions to practice. The findings of this dissertation contribute to practitioners through offering insight into whether and how ECMS adoption is associated with how organizations understand sustainability conventions widely held throughout their industry. As mentioned, organizations are more and more interested in embedding sustainability at every level of their operations, increasingly looking toward ECMS adoption as a means by which to address this issue (Howard-Grenville et al., 2014;

Terlaak, 2007). By examining how organizations' cultural competencies regarding such sustainability conventions are related to the adoption of an ECMS, this dissertation provides insight to organizational leaders regarding whether and how the investment in an ECMS might be associated with organizational action toward sustainability.

Importantly, this dissertation has practical implications for organizations, industry associations, and other stakeholder groups in that the formulation of an ECMS can be one mechanism by which to generate organizational alignment, and cohesive action, toward sustainability in an industry. This dissertation draws attention to the need to consider that different types of ECMS are more effective than others at instigating organizational alignment regarding sustainability understandings. In particular, this dissertation indicates that detailed, rigorous, and industry-specific ECMS programs are more associated with consensus surrounding sustainability meanings, than are generic, loosely defined ECMS. Additionally, this dissertation illuminates the decision-making within one particular ECMS that exemplifies these characteristics, thus providing practitioners with insight into how to structure and manage an ECMS program in order to promote both substantive adoption and cultural exchange. In industries for which action on sustainability remains a challenge, groups of stakeholders can work together to formulate this particular type of ECMS in an effort to assist organizations in developing more effective sustainability programs (Hörisch et al., 2014). This dissertation also brings awareness to organizations attempting a cultural shift toward a more sustainable mindset, that they can utilize an existing industry-specific ECMS program with rigorous guidelines to cultivate shared understandings of sustainability within organizations.

Limitations

There are two primary limitations of this dissertation research: specificity of the research context, and lack of observation of everyday organizational actions. First, the wine industry is agricultural in nature, which may diminish the generalizability of the findings of this dissertation to other industries. Agricultural organizations are close to the land, and thus conceivably are more aware of environmental and climate change matters because such issues have a direct impact on their daily operations (Resco et. al., 2010). For instance, organizations belonging to an industry that is primarily based in dealing with finished goods or services, such as retail or education, may not perceive the utility of

ECMS in the same way as organizations in agricultural industries. In addition, the wine industry is heavily populated by small to medium sized firms, which could impede the generalizability of the findings of this study to larger sized firms. Furthermore, the ECMS investigated in-depth in this dissertation – LIVE – is both region- and industry-specific, which may make the findings regarding LIVE less generalizable to other industry contexts.

Second, many processes in organizational culture are emergent in nature, resting in the interactions among organizational members, and thus requiring a modicum of observation in order to accurately capture organizational culture as a whole (Martin, 2002). This means that when conducting cultural research within organizations, a researcher cannot rely on interviews or surveys alone in order to most accurately assess everyday organizational actions (Martin, 2002).

Overall, however, these limitations did not have a large impact on the generalizability of the findings from this dissertation research, primarily due to the comparative nature of this study, as well as the number of organizations with which I conducted research. By including several organizations – mixing small, medium, and large firms in various locations – I had sufficient variance in organizations' responses both within and between regional industries, and thus the findings can reliably be generalized to other organizations and industries. Furthermore, the level of analysis of this dissertation research was at the organizational level, seeking to uncover cultural processes occurring at the boundaries of organizations and their environments; thus, observation was not a key methodological tool required by the operationalization of organizational culture in this study.

Opportunities for Future Research

Future research could address the limitations and extend the findings of this dissertation, including extending theory on cultural cultivation, and deepening our conceptual understanding of ECMS as cultural tools.

Extending the theories of cultural exchange. The findings of this dissertation present multiple avenues for future research in the areas of cultural exchange and a systems approach to culture, and linking culture to institution theory.

Further understanding cultural exchange. This dissertation looked at multiple organizations engaging with one shared culture group – an ECMS. The grounded model developed regarding cultural exchange suggests that organizational cultures are embedded in a complex system of higher-order cultures – including the industry, society, et al. – and so presumably organizations are simultaneously exchanging cultural resources with multiple cultural groups across levels of analysis. The conceptual model developed in this dissertation proposes that such exchange is occurring, but we yet know little about the cultural repercussions of such a complex, multi-level exchange process. What are the cultural outcomes across organizations engaged in cultural exchange if organizations in an industry are drawing on drastically different external cultural groups? Would we find that in the former case, organizational exchange still generate alignment if organizations are pulling from diverse cultural groups? Or would we find that organizations diverge around salient issues because they are engaging in exchange with different external cultural groups? Under what conditions does cultural exchange among organizations break down? Future research could examine these questions by examining cultural exchange occurring across multiple organizations in an industry with more diverse types of organizations – either in size, products, locations, customer bases, etc. – to ascertain if and how the nature and number of external cultural groups with which organizations engage in cultural exchange matters for generating alignment among organizations around a salient issue.

Power disparity in culture exchange processes. In this dissertation I found that LIVE member organizations were engaged in cultural exchange with the LIVE ECMS, primarily through the LIVE board of directors, with this exchange being associated with alignment surrounding the meanings and practice of sustainability across LIVE members. This research determined that the LIVE board is composed of relatively few members, many of whom are also owners and/or managers of LIVE member vineyards. Although not investigated in-depth in this dissertation, this research results in two striking observations that present opportunities for future research. First, as the LIVE board is composed of relatively few members, as compared to hundreds of LIVE member organizations, it seems the LIVE board members have a much higher power status in the exchange relationship with LIVE members. What is the significance of this power

differential in cultural exchange processes? Under what conditions do higher power status organizations leverage more influence in determining which cultural resources are disseminated across other organizations? What would be the enabling mechanisms for higher power status organizations to have their own cultural resources being disseminated – meaning that a few more powerful organizations would see their own meanings and practices spread across many other organizations? Future research could perhaps examine these questions with regard to large organizations engaging in cultural exchange with smaller organizations, or a collective of organizations engaging with individual organizations.

Linking cultural exchange with institution theory. This study examines the exchange of cultural meanings and practices among organizations in an industry with an ECMS, a tool that could also be viewed as an institution. Prior research in the broader CMS literature has used institution theory as frame through to view CMS as a "decentralized enforcement process to guide firm behaviors (Terlaak, 2007, p. 1). This view looks at CMS as "normlike institutions" that establish order in firm behaviors toward some desired end where informal norms or formal regulations are ineffective (Terlaak, 2007). Though largely voluntary, CMS specify sets of behaviors that are codified and certified, and involve the investment of valuable resources, so firms are more likely to conform to the behaviors set out in the CMS (King & Lenox, 2000; Terlaak, 2007). A cultural perspective on this institutional perspective suggests that firm strategy is shaped by the external cultural context of a firm, in that firms can "bridge social values" to shape cultural elements that create a favorable environment for the firm (Maurer, Crossan,). This cultural work creates economic value for the firm through aligning internal and external cultural values, and thus creating an advantage for the firm engaging in this cultural work (Maurer et al., 2011). From the findings of this dissertation, I found that multiple organizations were actively and intentionally engaging in cultural exchange with an ECMS, with the related finding that affiliation with this same ECMS was associated with significantly higher levels of average cultural competence regarding sustainability. Future research could build on the findings of this study to examine empirically whether and how the model of cultural exchange is appropriate for describing how firms shape cultural contexts to promote favorable

institutions and economic conditions. What is the nature of the relationship between the cultural exchange process and the shaping of institutions in a firm's external environment? Under what conditions does the cultural exchange process extend beyond the alignment of organizational cultures, to create competitive barriers for firms not engaging in the cultural exchange? To what extent can the cultural exchange process with a CMS, as was examined in this study, describe the shaping of an institution? Insight into these questions would enhance our understanding of links between culture and institutions, from a strategic perspective.

Deepening our understanding of ECMS as cultural tools. Further research could focus on pursuing a deeper investigation into the processes of ECMS adoption that constrain or enable how organizational members utilize an ECMS to understand and apply sustainability. This research could also explore the conditions under which ECMS adoption might be more likely to be associated with greater or lesser understanding of sustainability in an organization.

Organizational and ECMS characteristics. This dissertation illuminated characteristics of an ECMS that enhanced its viability to align sustainability meanings, so perhaps there are particular configurations of organizational characteristics that are more likely to enable or constrain the effectiveness of an ECMS in this way. Furthermore, this dissertation presents the opportunity to investigate the implications of industry-specificity of an ECMS regarding its effectiveness to align sustainability meanings and practices. Along these lines, future research could investigate in more depth similarities and differences in substantive change toward sustainability made in organizations adopting a generic ECMS or an industry-specific ECMS.

Structure of ECMS to facilitate cultural exchange. Along these lines, future research could also pursue a deeper investigation into the decision making within ECMS program underlying the association between ECMS practices and organizational understandings of sustainability. In this dissertation, I investigated one such ECMS – LIVE – that was demonstrated to be strongly associated with aligning cultural meanings and practices regarding sustainability, illuminating four key activities in which LIVE engaged consistently that facilitated cultural exchange. Future research could explore if these activities are common across other ECMS that demonstrate association with

aligning meanings and practices across adopting firms – comparing either different regional wine industries or different industries altogether. Deeper insight into the activities and decision making of the ECMS programs themselves would enhance our knowledge regarding how to structure and manage ECMS programs in order to encourage both substantive adoption and cultural exchange regarding shared sustainability meanings and practices across an industry. Such avenues for future research can enhance our deeper understanding of ECMS as tools with which organizations can understand and act on sustainability in everyday organizational life.

Conclusion

In this dissertation, I investigated how organizations understand and apply shared meanings of sustainability. Integrating recent theoretical developments regarding organizational culture with findings from prior literature suggesting that corporate codes can be effective instruments for shaping employee behavior, I described the flexible exchange of cultural resources between organizations and their environment with respect to the adoption of environmental certified management standards (ECMS). I found that the adoption of an ECMS is associated with an alignment among organizations regarding how they understand and apply sustainability, with three characteristics enhancing the effectiveness of an ECMS in cultivating alignment: detailed practice descriptions, demanding objectives to achieve and maintain, and industry specificity. I further uncovered key activities involving the interaction of ECMS governing organizations and ECMS members facilitate alignment in cultural meanings and practices surrounding sustainability through specific mechanisms. I developed a grounded conceptual model of cultural exchange, describing how organizations serve varying roles in the cultural exchange process, and that each role leverages a set of specific mechanisms to facilitate the adaptation, generation, and transfer of existing and new cultural meanings and practices to organizations drawing on a shared cultural repertoire. The findings from this study contribute to enhancing our theoretical understanding of organizational culture as an open system through a more complex, and hierarchical account of cultural exchange, as well as develop insight into how the substantive adoption of ECMS practices is associated with alignment among organizations regarding cultural meanings and practices regarding a salient issue in an industry, such as sustainability.

APPENDIX A

IRB APPROVAL FOR FIRST ROUND OF INTERVIEWS

UNIVERSITY OF OREGON

DATE: July 19, 2013 IRB Protocol Number: 06212013.030

TO: Brooke Lahneman, Principal Investigator
Lundquist College of Business

RE: Protocol entitled, "An investigation into the influence on organizational culture of the adoption of standardized sustainability practices"

Notice of IRB Review and Exempt Determination
as per Title 45 CFR Part 46.101 (b)(2)

The above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that qualifies for an exemption from IRB review under 45 CFR 46.101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

Please note that you will not be required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire July 18, 2018. Should your research continue beyond expiration date, you will need to submit a new protocol application.

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

Sincerely,

Sheryl Johnson, BS, CHES, CIP
Associate Director
Research Compliance Services
University of Oregon

CC: Jennifer Howard-Grenville, Faculty Advisor

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS • RESEARCH COMPLIANCE SERVICES
677 E. 12th Ave., Suite 500, 5237 University of Oregon, Eugene OR 97401-5237
T 541-346-2510 F 541-346-5138 http://humansubjects.uoregon.edu

APPENDIX B

IRB APPROVAL FOR FIRST ROUND OF INTERVIEWS

UNIVERSITY OF OREGON

DATE: July 26, 2013 IRB Protocol Number: 06212013.030

TO: Brooke Lahneman, Principal Investigator
Lundquist College of Business

RE: Protocol entitled, "An investigation into the influence on organizational culture of the adoption of standardized sustainability practices"

Notice of IRB Review and Exempt Determination-Amendment
as per Title 45 CFR Part 46.101 (b)(2)

The amendment submitted on July 23, 2013 to the above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that continues to qualify for an exemption from IRB review under 45 CFR 46. 101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

You are not required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire July 18, 2018. Should your research continue beyond expiration date, you will need to submit a new protocol application.

Amendment: Change of study/recruitment site from Virginia to Washington state.

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

Sincerely,

Sheryl Johnson, BS, CHES, CIP
Associate Director
Research Compliance Services
University of Oregon

CC: Jennifer Howard-Grenville, Faculty Advisor

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APPENDIX C

IRB APPROVAL FOR SURVEY

UNIVERSITY OF OREGON

DATE: December 20, 2013 IRB Protocol Number: 06212013.030

TO: Brooke Lahneman, Principal Investigator
Lundquist College of Business

RE: Protocol entitled, "An investigation into the influence on organizational culture of the adoption of standardized sustainability practices"

Notice of IRB Review and Exempt Determination-Amendment
as per Title 45 CFR Part 46.101 (b)(2)

The amendment submitted on December 05, 2013 to the above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that continues to qualify for an exemption from IRB review under 45 CFR 46. 101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

Please note that you will not be required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire July 18, 2018. Should your research continue beyond expiration date, you will need to submit a new protocol application.

Amendment: Changes made to the research plan, consent forms, and survey instruments.

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

Sincerely,

Sheryl Johnson, BS, CHES, CIP
Associate Director
Research Compliance Services
University of Oregon

CC: Jennifer Howard-Grenville, Faculty Advisor

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APPENDIX D

IRB APPROVAL FOR SECOND ROUND OF INTERVIEWS

UNIVERSITY OF OREGON

DATE: June 16, 2014 IRB Protocol Number: 06212013.030

TO: Brooke Lahneman, Principal Investigator
Lundquist College of Business

RE: Protocol entitled, "An investigation into the influence on organizational culture of the adoption of standardized sustainability practices"

Notice of IRB Review and Exempt Determination-Amendment
as per Title 45 CFR Part 46.101 (b)(2)

The amendment submitted on June 09, 2014 to the above protocol has been reviewed by the University of Oregon Institutional Review Board and Research Compliance Services. This is a minimal risk research protocol that continues to qualify for an exemption from IRB review under 45 CFR 46. 101(b)(2) for research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

You are not required to submit continuing reviews for this protocol, however, you must submit any changes to the protocol to Research Compliance Services for assessment to verify that the protocol continues to qualify for exemption. This exempt determination will expire July 18, 2018. Should your research continue beyond expiration date, you will need to submit a new protocol application.

Amendment: This amendment covers the addition of a second round of interviews, to be conducted following the implementation of the survey. Consequently, the Research Plan was updated and new consent documents were provided.

Your responsibility as a Principal Investigator also includes:

- Obtaining written documentation of the appropriate permissions from public school districts, institutions, agencies, or other organizations, etc., prior to conducting your research
- Notifying Research Compliance Services of any change in Principal Investigator
- Notifying Research Compliance Services of any changes to or supplemental funding
- Retaining copies of this determination, any signed consent forms, and related research materials for five years after conclusion of your study or the closure of your sponsored research, whichever comes last.

As with all Human Subject Research, exempt research is subject to periodic Post Approval Monitoring review.

If you have any questions regarding your protocol or the review process, please contact Research Compliance Services at ResearchCompliance@uoregon.edu or (541)346-2510.

Sincerely,

Sheryl Johnson, BS, CHES, CIP
Associate Director
Research Compliance Services
University of Oregon

CC: Jennifer Howard-Grenville, Faculty Advisor

APPENDIX E

FULL COPY OF DISTRIBUTED SURVEY

Section A. Introduction and Informed Consent

Conditions of participation:

Thank you for considering participating in our study. The purpose of this study is to learn about how companies in your regional industry make decisions regarding situations involving "sustainability" in vineyard management. For this survey, "sustainability" includes making decisions that account for financial, social, and environmental risks, obligations and opportunities.

This research is being conducted by Brooke Lahneman, Management PhD Student at the University of Oregon, under the supervision of Dr. Jennifer Howard-Grenville, Associate Professor of Management at the University of Oregon.

The survey should not take more than 30 minutes to complete.

Participation is voluntary. Information obtained from this survey will be used for research purposes only. Identifiable information will be kept anonymous from your employer and third parties. Identifiable data will remain confidential and will not be disclosed to any third party without your informal consent. Aggregated results may be presented unidentified in academic journals and conferences.

RAFFLE INFORMATION: As a thank you for participating in this survey, we are offering 2 chances to win a $100 gift card. The winners of these 2 gift cards, to be used at venues of your choice, will be chosen at random from those participants who submit a completed questionnaire.

If you have any questions about the study, you can contact Brooke Lahneman (lahneman@uoregon.edu), Management Department, Lundquist College of Business, University of Oregon, Eugene, Oregon.

[Please scroll down to read all questions.]

Please read the phrases below and select the checkboxes if you agree to the statements:

□ I have read the conditions of participation.

□ I agree to participate.

□ Next page…

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The first sets of questions we will ask pertains to **various kinds of decisions that a vineyard manager could make in the vineyard**.

Some of these decisions may not be ones that you personally would take, so we are asking you to answer not only based on your own experience, but also the experience of others – or based on no previous experience with the situation. We also understand that some responses may require more information to answer completely; but we are only asking that you make the best choice given the information provided.

We understand that many situations appear repetitive, which is intended in order to obtain a well-rounded picture of decision-making in viticultural management. For the questions asked, we'd like to know how you best understand or perceive the situation being described, and so there is no right or wrong answer. So please answer each question carefully, and to the best of your ability.

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Section. B. Frequency of common viticultural practices

Section B1. Frequency of common viticultural practices - Respondent

Instructions: Please read the practices below carefully. Think about a typical season managing a vineyard. Please rate how frequently **your vineyard** carries out the following practices.

Practices	**1 = Very Infrequently**	**2**	**3**	**4 = Very Frequently**
1) Avoiding use of all chemical sprays.				
2) Spraying USDA Organic compounds.				
3) Spraying synthetic chemical compounds.				
4) Using biodiesel.				
5) Using petroleum-based diesel.				
6) Spreading animal manure in the vineyard soil.				
7) Spreading composted materials in the vineyard soil.				
8) Spreading commercial fertilizers in the vineyard soil.				
9) Mowing in the alleyways between the vine rows.				
10) Cultivating cover crops into the soil of the alleyways between vine rows.				
11) Maintaining cover crops in the alleyways between vine rows.				
12) Conducting soil tests.				
13) Irrigating the vineyard.				
14) Using drip-irrigation in the vineyard.				
15) Avoiding irrigation in the vineyard entirely.				
16) Maintaining grasses around the perimeter of the vineyard, or in a nearby meadow.				
17) Leaving the soil unplanted in the alleyways between vine rows.				
18) Fostering a population of beneficial insects on the vineyard site.				

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Section B2. Frequency of common viticultural practices – Perception of industry peers

B2.1) Out of the choices provided, which would you choose to best describe how you define your "**regional industry**"? [Please choose only one (1).]
□ County
□ AVA
□ State (e.g., Oregon or Washington)
□ Geographical region (e.g., Pacific Northwest)

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B2.2) Instructions: Please read the practices below carefully. Think about a typical season managing a vineyard. To the best of your knowledge, please rate your perception of how frequently **other vineyards in your regional industry** carry out the following practices.

Practices	**1 = Very Infrequently**	**2**	**3**	**4 = Very Frequently**
1) Avoiding use of all chemical sprays.				
2) Spraying USDA Organic compounds.				
3) Spraying synthetic chemical compounds.				
4) Using biodiesel.				
5) Using petroleum-based diesel.				
6) Spreading animal manure in the vineyard soil.				
7) Spreading composted materials in the vineyard soil.				
8) Spreading commercial fertilizers in the vineyard soil.				
9) Mowing in the alleyways between the vine rows.				
10) Cultivating cover crops into the soil of the alleyways between vine rows.				
11) Maintaining cover crops in the alleyways between vine rows.				
12) Conducting soil tests.				
13) Irrigating the vineyard.				
14) Using drip-irrigation in the vineyard.				
15) Avoiding irrigation in the vineyard entirely.				
16) Maintaining grasses around the perimeter of the vineyard, or in a nearby meadow.				
17) Leaving the soil unplanted in the alleyways between vine rows.				
18) Fostering a population of beneficial insects on the vineyard site.				

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Section C. Cultural Competency Scale Items

Categorize Sustainability Items – Materials and Land Management

'Sustainability' refers to making business decisions that meet the needs of the present without compromising the ability of future generations to meet their own needs. (United Nations, 1987)

Instructions: Please read the practices below carefully. Out of the choices provided, please choose the **best answer** that captures what you understand is a **sustainable** approach to materials and land management. We understand that many situations appear repetitive, which is intended in order to obtain a well-rounded picture of decision-making in viticultural management. For the questions asked, we'd like to know how you best understand or perceive the situation being described, and so there is no right or wrong answer. So please answer each question carefully, and to the best of your ability.

Practice	**1 – Very Un-Sustainable**	**2**	**3**	**4 – Very Sustainable**
1) Designing a system of integrated pest management practices in such a way that minimizes the use of chemicals in the vineyard.				
2) Relying solely on spraying chemicals to control pest issues in the vineyard.				
3) Regularly spraying *USDA Organic insecticides* throughout the entire vineyard to *prevent* issues with insect pests that might arise.				
4) Spraying *USDA Organic insecticides* to control issues with insect pests, only when an insect infestation occurs in the vineyard.				
5) Spraying *Sulfur* in the vineyard to avoid mildew issues, using only the minimum effective amount permitted to control the issue.				
6) Spraying as much *Sulfur* as needed in the vineyard to avoid mildew issues.				
7) Spraying *Sulfur* to treat mildew issues, only after mildew has arisen in the vineyard.				
8) Spraying *Sulfur* to prevent mildew issues from arising in the vineyard.				
9) Spraying a synthetic chemical in the vineyard to control an insect pest infestation, using the *minimal effective amount* as specified on the "label" as a guide to control the insect pest issue.				
10) Spraying a synthetic chemical in the vineyard to control an insect pest infestation, using *as much of the chemical as permitted* by the "label" to ensure control of the insect pest issue.				
11) Spraying synthetic chemicals in the vineyard to prevent mildew issues – using only those *chemicals approved by an environmental certification organization*.				
12) Spraying synthetic chemicals in the vineyard to prevent mildew issues – using *chemicals marketed by chemical companies* as being the most effective in preventing mildew.				
13) Choosing to spray synthetic chemicals throughout the entire vineyard to prevent issues with insect pests from arising.				
14) Choosing to spray synthetic chemicals throughout the entire vineyard to treat an insect pest infestation only after one occurs.				
15) Using *biodiesel* fuel in the tractors.				

Practice	**1 – Very Un-Sustainable**	**2**	**3**	**4 – Very Sustainable**
16) Using *petroleum-based diesel* fuel in the tractors.				
17) Using the tractors *as needed* throughout the year, depending on the issues and needs that arise in the vineyard throughout the year.				
18) Planning the spray program in advance in an effort to *minimize* the number of tractor passes through the vineyard for the year.				
19) Spreading a *commercial fertilizer* in the vineyard to address multiple nutrient deficiencies in the vineyard soil.				
20) Spreading *animal manure* in the vineyard to address multiple nutrient deficiencies in the vineyard soil.				
21) Spreading a *commercial fertilizer rich in potassium* in the vineyard to address a potassium deficiency in the vineyard soil.				
22) Spreading *composted materials* in the vineyard to address a potassium deficiency in the vineyard soil.				
23) Growing a perennial cover crop in the alleyways between vine rows, *regularly mowing* the cover crop throughout the year.				
24) Growing and maintaining a perennial cover crop in the alleyways between vine rows, *cultivating the cover crop* into the soil after harvest.				
25) Spreading fertilizer in vineyard sections where there are typically nutrient deficiencies, *without first conducting soil tests*.				
26) Spreading fertilizer only in vineyard sections where *soil tests indicate* there are distinct nutrient deficiencies.				
27) *Regularly mowing* grasses around the perimeter of the vineyard site, or in a nearby meadow.				
28) *Growing and maintaining* grasses around the perimeter of the vineyard site, or in a nearby meadow.				
29) *Growing and maintaining* grasses in the alleyways between the vine rows.				
30) Leaving the soil *unplanted* in the alleyways between the vine rows.				
31) Assessing soil health solely by conducting *regular soil tests* throughout the vineyard.				
32) Assessing soil health solely by looking at the *vigor of the canopy*.				
33) Leaving the alleyways between the vine rows unplanted, and spreads *fertilizers* to address nutrient deficiencies in the soil.				
34) Growing a *cover crop* that is rich in a nutrient that is deficient in the soil in the alleyways between the vine rows.				
35) Spraying the minimum effective amounts of *various* chemical compounds to fight invasive weeds in the vineyard.				
36) Spraying the minimum effective amount of *one* chemical compound to fight invasive weeds in the vineyard.				
37) Growing and maintaining tall grasses in the alleyways between vine rows to provide a habitat for *beneficial insects*.				
38) Regularly mowing the grasses in the alleyways between vine rows to *control weeds*.				

Practice	**1 – Very Un-Sustainable**	**2**	**3**	**4 – Very Sustainable**
39) Typically irrigating a vineyard located in a *wet* climate.				
40) Typically irrigating a vineyard located in a *dry* climate.				

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Section D. Background Information

Section D1. ECMS Status Information

Instructions: Please answer the following questions.

1) Which of the following environmental/sustainability certifications have you have heard about? [Please mark all that apply.]
   □ Biodynamic
   □ Organic
   □ LIVE (Low Input Viticulture and Enology)
   □ Others _____

2) Has your vineyard company ever adopted an environmental/sustainability certification? [Please choose only one (1).]
   □ Yes, currently participate formally and pay membership fee
   □ Yes, in the process of adopting formally, but do not yet pay formal membership fee
   □ Used to participate formally and pay membership fee, but do not participate any longer
   □ No, never participated formally nor paid membership fee
   □ Others _____

3) With the scale provided, please rate the **level of importance placed on different aspects of sustainability in the decision-making** that occurs regarding daily practices at your vineyard site.

Aspect of sustainability	**1 – Not at all**	**2- Somewhat important**	**3 - Important**	**4 – Very Important**	**5 – Extremely important**
Economic sustainability					
Environmental sustainability					
Social sustainability					

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_____FOR THOSE THAT RESPONDED "NO" → Skip next questions and go to Section F_____
_____FOR THOSE THAT RESPONDED OTHERWISE → CONTINUE ONTO NEXT QUESTIONS_____

4) Which of the following certifications does your vineyard hold, currently or previously, or is preparing to adopt?? For each certification and status selected, please indicate how many years the certification is/was held. [Please mark all that apply.]

Certification	**Certification status**	**Years Certified (or in progress of becoming certified)**
Biodynamic	□ Currently certified	[text box]
	□ Preparing to adopt	[text box]
	□ No longer certified	[text box]
LIVE (Low Input Viticulture and Enology)	□ Currently certified	[text box]
	□ Preparing to adopt	[text box]
	□ No longer certified	[text box]

Organic	□ Currently certified	[text box]
	□ Preparing to adopt	[text box]
	□ No longer certified	[text box]

5) What was your level of involvement in the decision to adopt an environmental/sustainability certification?
□ Not involved at all
□ Somewhat involved
□ Very Involved
□ Sole decision maker
□ Not Applicable
□ Other _____

6) Does your vineyard hold a position on the Board of Directors of an environmental/sustainability certification organization? [Please choose only one (1).]
□ Yes
□ No
□ Used to, but do not participate anymore
□ Not applicable
□ Other _____

7) How many educational seminars provided by an environmental/sustainability certification agency do you attend each year, on average? [Please choose only one (1).]
□ None
□ 1-3 seminars
□ 4-6 seminars
□ 7-12 seminars
□ 13-20 seminars
□ 21+ seminars
□ Not applicable

8) How often do auditors associated with environmental/sustainability certifications inspect your vineyard's operations? [Please choose only one (1).]
□ Never
□ Annually
□ Every 2-3 years
□ Every 4-5 years
□ Every 6 years or more
□ Not Applicable
□ Other _____

9) Which of the following aspects of vineyard management best describe(s) your vineyard company's motivation to adopt the environmental/sustainability certification(s)? [Please mark all that apply.]
□ Improve eco-system management
□ Marketing
□ Pressure from buyers
□ Support sustainability movement in industry
□ Use as template for sustainability best practices
□ Want third party oversight
□ Other _____

10) Which of the following aspects of vineyard management have changed the most since your vineyard started the process of adopting the environmental/sustainability certification(s)? [Please mark all that apply.]
□ Canopy Management
□ Chemical Usage
□ Erosion Control
□ Fertilizer Usage
□ Fuel Usage
□ Human Resources Management
□ Irrigation
□ Pest Management
□ Planning and Scheduling
□ Record-Keeping
□ Soil Management
□ Tractor Usage
□ Water Usage
□ Other _____

Instructions: For question 11, please use the rating scale provided to choose your **best** answer.

11) Question: How would you rate the difficulty of integrating the practices required by the environmental/sustainability certification(s) into your vineyard's operations?	Quantity of changes made	Scale of changes made
Economic management of your vineyard operations (i.e., costs)	□ Few □ Many	□ Incremental, or minor, changes □ Radical, or major, changes
Environmental management aspects of your vineyard operations (i.e., land management)	□ Few □ Many	□ Incremental, or minor, changes □ Radical, or major, changes
Social management aspects of your vineyard operations (i.e., community relations, employees)	□ Few □ Many	□ Incremental, or minor, changes □ Radical, or major, changes

□ Next page…

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Section D2. Company and respondent demographic information

Instructions: Please answer the following questions.

1) How people work full-time on your vineyard site? [Please choose only one (1).]

□ 1-10
□ 11-25
□ 26-50
□ 51-100
□ 101-250
□ 251-500
□ 501+

2) How many acres does your vineyard site utilize to grow grapes, on average? [Please choose only one (1).]

□ 1-25 acres
□ 26-50 acres
□ 51-100 acres
□ 101-250 acres
□ 251-500 acres
□ 501-1,000 acres
□ 1,001-2,500acres
□ 2,501+ acres

3) Which of the following grape varietals are grown on the vineyard site you manage? [Please mark all that apply.]

Grape Varietal	% Acreage
□ Cabernet Franc	% of total acreage: ____[text box]_____
□ Cabernet Sauvignon	% of total acreage: ____[text box]_____
□ Malbec	% of total acreage: ____[text box]_____
□ Merlot	% of total acreage: ____[text box]_____
□ Pinot Noir	% of total acreage: ____[text box]_____
□ Syrah	% of total acreage: ____[text box]_____
□ Chardonnay	% of total acreage: ____[text box]_____
□ Gewurtztraminer	% of total acreage: ____[text box]_____
□ Pinot Blanc	% of total acreage: ____[text box]_____
□ Pinot Gris	% of total acreage: ____[text box]_____
□ Riesling	% of total acreage: ____[text box]_____
□ Sauvignon Blanc	% of total acreage: ____[text box]_____
□ Others: _[text box]_____[text box]_____ _[text box]_____	% of total acreage: ____[text box]_____ % of total acreage: ____[text box]_____ % of total acreage: ____[text box]_____

4) If you **purchase** grapes from other vineyards, please rate the extent to which the **seller** having an environmental certification influences your **purchasing decision**. [Please choose only one (1).]

□ I only purchase grapes from vineyards that have environmental certifications.

□ I would prefer to purchase grapes only from vineyards that have environmental certifications, but this is not possible all the time.
□ I do not have a preference, and often purchase grapes from vineyards without environmental certifications.
□ Not applicable
□ Other _____

5) If you **sell** grapes to other vineyards or wineries, please rate the extent to which the **buyer** having an environmental certification influences your **sales decision**. [Please choose only one (1).]
□ I only sell grapes to vineyards and/or wineries that have environmental certifications.
□ I would prefer to sell grapes only to vineyards and/or wineries that have environmental certifications, but this is not possible all the time.
□ I do not have a preference, and often sell grapes to vineyards and/or wineries without environmental certifications.
□ Not Applicable
□ Other _____

6) In what state is the vineyard site you manage located? [Please choose only one (1).]
□ Oregon □ Washington □ Other _____

7) Which region(s) best describe(s) the location of the primary vineyard site you manage? [Please choose up to two (2).]
□ Ancient Lakes of Columbia Valley AVA
□ Applegate Valley AVA
□ Chehalem Mountains AVA
□ Columbia Gorge AVA
□ Columbia Valley AVA
□ Dundee Hills AVA
□ Eola-Amity Hills AVA
□ Elkton Oregon AVA
□ Horse Heaven Hills AVA
□ Lake Chelan AVA
□ McMinnville AVA
□ Naches Heights AVA
□ Puget Sound AVA
□ Rattlesnake Hills AVA
□ Red Mountain AVA
□ Ribbon Ridge AVA
□ Rogue Valley AVA
□ Snipes Mountain AVA
□ Southern Oregon AVA
□ Umpqua Valley AVA
□ Wahluke Slope AVA
□ Walla Walla Valley AVA
□ Willamette Valley AVA
□ Yakima Valley AVA
□ Yamhill Carlton AVA
□ Other _____

8) Which of the following roles best describe your position with the vineyard company? [Please choose as many as apply.]
□ Owner/Proprietor
□ General Manager
□ Vineyard Manager
□ Winery Manager
□ Sales/Marketing
□ Tasting Room
□ Other _____

9) Do you hold a management role in the vineyard company? [Please choose only one (1).]
□ Yes □ No

10) If you answered "yes" to the prior question, how many years have you been in a management role in the company? [Please choose only one (1).]
□ < 1 year
□ 1-5 years
□ 6-10 years
□ 11-15 years
□ 16-20 years
□ 21+ years

11) What is the highest degree you have obtained? [Please choose only one (1).]
□ High School
□ University 2-year degree

□ University 4-year degree
□ Master's degree
□ Doctorate degree
□ Other _____

12) Which of the following best describes the area in which you earned your highest degree obtained? [Please choose only one (1).]
□ Architecture
□ Art
□ Biology
□ Business
□ Chemistry
□ Communications/Journalism
□ Computer Science
□ Economics
□ Education
□ Engineering
□ Environmental Science
□ Finance/Accounting
□ History
□ International Studies
□ Law
□ Mathematics
□ Political Science
□ Psychology/Sociology
□ Viticulture/Enology
□ Other _____

13) In what year was your vineyard site founded or purchased? [Please choose only one (1).]
□ <1 year
□ 1-5 years
□ 6-10 years
□ 11-15 years
□ 16-20 years
□ 21+ years

□ Next page…

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Section E. Additional Information

If there is anything information you would like to share surrounding business sustainability and/or environmental certifications in your regional wine industry, any comments are very much appreciated. [*Please write your response in the box below.]*

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Section F. Concluding Remarks

Thank you for participating in this study!

i. If you would like to receive the results from this study, please mark the appropriate box below. If you mark "yes," please provide the appropriate email address in the box provided.

□ Yes, please contact me regarding the results of this survey. The appropriate email to which the results should be sent is:

□ No, please do not contact me regarding the results of this survey.

ii. If you would be interested in participating further in this study, please mark the appropriate box below. If you mark "yes," please provide the appropriate email address in the box provided.

□ Yes, I would be interested in participating further in this study. The appropriate email at which I can be contacted for follow up is:

□ No, I am not interested in participating further in this study.

iii. If you would like to be entered in the raffle to receive 1 of 2 possible $100 gift cards, please mark the appropriate box below. If you mark "yes," please provide the appropriate email address in the box provided. Upon winning, we will contact you via email to obtain a mailing address.

□ Yes, please enter me into the raffle, with prizes to be drawn at random. The appropriate email to contact me is:

□ No, please do not enter me into the raffle.

iv. I wish to disclose my name and/or my company's name. [Please choose as many as you'd like.]

□ Yes, my name is:

□ Yes, my company's name is:

□ No, please do not enter me into the raffle.

Thank you!!
□ Click to Exit Survey

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