COOKING AND COALESCENCE:
EXPLORING THE CONSTRUCTION OF COMMUNITY AND CUISINE AT MORTON VILLAGE

By

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ABSTRACT

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Over the last few decades, archaeologists have found increasing evidence for migration and other forms of population movement among precontact Indigenous groups in North America, creating dynamic social interactions that directly impacted local communities and regional networks. In some cases, these interactions appear to have stimulated new cultural developments, such as the growth of larger communities and the development of new institutions or practices, which helped to shape the history of these regions. In response, archaeologists have begun to shift their focus toward understanding how these multi-cultural, or coalescent, communities were formed and the processes that made them successful. A number of mechanisms have been identified that promoted integration in these communities, but, so far, research has focused on large-scale organizational changes, such as the development of new social institutions, over small-scale, everyday interactions. In this dissertation, I examine foodways practices and their role in coalescence to demonstrate that small-scale interactions were also critical for community integration and coalescence. To investigate these practices, I conducted ceramic use-alteration and spatial analyses at Morton Village, a site of on-going coalescence in the central Illinois River valley, as well as at two comparative sites, Larson and the Tremaine Complex, in order to examine cooking and consumption practices in pre- and post-migration contexts. Comparisons of data from these sites revealed that some traditional foodways practices were maintained by the migrant and local residents at Morton Village, while other practices were slowly shifting, creating a unique cuisine at the site. Through both larger

communal events and everyday cooking, shifts in foodways at Morton Village may have helped to link migrant and local residents together, promoting community integration from the bottom-up. This research indicates that everyday interactions can also be critical for successful coalescence, not just large-scale organizational changes, demonstrating that multi-scalar approaches are needed to better understand this process.

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CHAPTER 1:

INTRODUCTION

In recent years, archaeologists have found increasing evidence for migration and other forms of population movement in the Midwest and other regions of North America. Stimulated by a greater theoretical focus on migration and improvements in methods used to identify these events (Anthony 1990; Burmeister 2000; Montgomery 2010), this research has increasingly shown that past populations were more dynamic and social boundaries were more fluid than previously thought (Cameron 2013; Cobb 2005; Slater et al. 2015). In response, archaeologists have begun to shift their focus toward understanding how these aggregated (Birch 2013) or coalescent (Clark et al. 2019; Kowalewski 2006) communities were formed and the processes that shaped them into successful communities.

In this research, a number of larger social mechanisms have been identified, including the development of new or augmented social institutions focused on integration, creation or use of more egalitarian ideologies, an emphasis on collective defense, and the intensification of local production and trade, which have been used to integrate people from different locations and backgrounds into a community (Kowalewski 2006; Clark et al. 2019). These mechanisms have been used as a model to help understand processes of aggregation and coalescence in the archaeological record, but often at a regional or sub-regional level. Recent research (Birch 2012, 2013) has begun to tack between regional and local scales, asking the question of how these long-term processes played out in the everyday lived experiences of those who created these coalescent communities. Using this approach, researchers have focused primarily on the built environment of communities through time, extrapolating information about social interaction and integration from changes in settlement histories, community organization, and the use of public spaces (Birch 2012). Despite a greater focus on understanding processes of coalescence at multiple scales, analyses have privileged the investigation of larger organizational changes, such as shifts in social organization and political systems, over the examination of everyday practices and interactions.

One approach to the lived experience of coalescence that has not been emphasized is foodways. Food practices occur everyday in most, if not all, households, functioning to provide individuals with the necessary energy and nutrients needed to survive. Yet food, this basic human need, is also an inherently social phenomena; it and the many practices surrounding it act as important symbols that communicate a great amount of social information to those participating in the meals and others around them. In this way, information about identity, power, religion, and many other social factors can be put on display through the performance of food (Crowther 2013; Twiss 2012). While symbolic, foodways are not passive reflections of social phenomena, but are actively used to manipulate and negotiate various social circumstances (Hastorf 2017). For instance, food is often one way that people can begin to share their culture with others, and sharing communal meals and rituals, such as in feasting, can help to bring different segments of a community together (Kassabaum 2018, 2019). In coalescent societies, along with changes to political and social institutions, foodways also may have functioned as an everyday mechanism through which people interacting in these spaces could negotiate living in this shared space and begin to forge new ties with their neighbors.

In this dissertation, I will demonstrate the utility of investigating foodways among post-migration coalescent communities. Particularly, a framework of foodways and hybridization offers a unique, ground-up perspective for understanding the way these communities were shaped, not just by larger social institutions, but by choices individuals made every day. In doing so, I seek to address two general questions: (1) What role do foodways choices play in the larger process of post-migration coalescence? and (2) Does this perspective add new information to our understanding of this process?

To address these questions, I focus on a case study in west-central Illinois, an archaeological site known as Morton Village. Morton Village is a multi-cultural village dated to between cal. A.D. 1300-1400 that was occupied simultaneously by both local Mississippian and migrant Oneota groups (Bengston and O'Gorman 2016; Santure et al. 1990; Silva et al. 2014). This site is the result of a larger Oneota migration into the central Illinois River Valley, known as the Bold Counselor Phase, of which Morton Village is one of at least five sites that were occupied during this time (Esarey and Conrad 1998). While research at the site is still underway, analyses of ceramic, mortuary, and architectural evidence suggest that complex social negotiations were occurring, likely as part of on-going coalescence at the site (Bengtson and O'Gorman 2016; Esarey and Conrad 1998; Painter and O'Gorman 2019; Upton 2019).

In order to examine foodways practices in this community, I focus on cooking and vessel function through an analysis of ceramic use-alteration patterns. To reveal post-migration changes in cooking that occurred at the site, I also examine use-alteration patterns at two comparative sites that document Oneota and Mississippian food practices prior to the migration, the Mississippian Larsen site and the Oneota Tremaine Complex. At Morton Village, I have three research questions that I address, each of which has two parts:

1) What cooking and serving practices were used at the community level at Morton Village, when all vessels are treated as one sample? Do comparisons of these practices to data from Larson and the Tremaine Complex uncover any differences in foodways from pre- to post-migration contexts?

2) At Morton Village, are there evident differences in cooking and serving practices between Oneota-style and Mississippian-style ceramics? Is the continuation of past foodways traditions visible when Mississippian-style vessels are compared to Larson and Oneota-style vessels are compared to the Tremaine Complex?

3) What is the spatial distribution of cooking and serving practices inside and outside of structures at Morton Village? When compared to Larson and the Tremaine Complex, are there any differences in the spatial organization of foodways from pre- to post-migration contexts?

Unfortunately, this research is limited by a few issues. Use-alteration analysis, while incredibly useful, is also limited in the amount of detail that can be collected. For the most part, cooking techniques can only be inferred at a general level from use-wear patterns, such as wet or dry mode cooking, instead of recovering more specific information about the way vessels were used. Use-wear patterns can also be difficult to interpret, meaning that the functions of a significant portion of vessels have to be marked as unknown. More experimentation and observation are needed to help increase the interpretability of these patterns. Use-alteration analysis also requires large sections of vessels to be able to interpret use-wear patterns with any certainty; this issue severely limits the sample size that can be used for cooking comparisons between sites. This research is also limited in the scope of cooking techniques that I can effectively examine. Cooking is a complex behavior, often involving more than just ceramic vessels, but many of these other utensils and cooking techniques do not preserve well or are hard to detect archaeologically; therefore, I am limited to what data I can gather about cooking techniques from ceramic vessels. Finally, as will be discussed in later chapters, we are currently unable to detect spaces exclusive to migrants and locals at Morton Village. In my analysis, I instead use pottery style to split the ceramic assemblage into two groups. This division can be problematic, as pottery style can be insignificant or represent any number of social constructions besides ethnicity (Croucher and Wynne-Jones 2006; Longacre 1991), but it is a dimension of variability at Morton Village that is worth examining. I understand this to be a starting point into exploring ceramic variability at the site that will hopefully lead to a better understanding of the dynamics of pottery style and use.

Despite these limitations, this research is significant for a number of reasons. Through its focus on life at Morton Village, this research will provide new information about the site, as well as more information regarding the social interactions occurring throughout the central Illinois River valley during the Bold Counselor Phase. By taking a bottom-up instead of a top-down approach to examining coalescence, this work will also provide a different perspective that will help archaeologists to better understand these processes and to refine their models of coalescence. Methodologically, this dissertation uses use-alteration analysis to answer larger social questions, demonstrating that such analyses can be used to explore topics beyond technological change and vessel function.

Organization of Dissertation

In the following chapter, I outline my theoretical framework for this study, including a more detailed discussion of coalescence and the roles of foodways and hybridization within that process. In Chapter 3, I present background information on my case study for this dissertation, the Morton Village site, as well as broad overviews of the Mississippian and Oneota Traditions. I also introduce the two comparative sites used for this research, the Tremaine Complex and Larson, and why they were selected.

In Chapter 4, I revisit the particular research questions that are the focus of this dissertation and the methods and materials that were used to address them. This includes detailed information regarding the sampling strategies used, how the data was collected and transformed, and how the data was then analyzed and compared between the sites.

Following Chapter 4 are three chapters that detail the results of analyses conducted for this dissertation. For clarity, one results chapter was written for each of the three research questions addressed. In Chapter 5, I outline the results of morphological analyses conducted to detect any variations in vessel shape between the sites that may have implications for vessel function. I then detail the results of site level ceramic use-alteration analyses conducted to address Research Question 1. Results of intra-site level ceramic use-alteration analyses performed to address Research Question 2, in which the Morton Village ceramic sample is divided into Oneota- and Mississippian-style sub-assemblages, are outlined in Chapter 6. Finally, Chapter 7 presented the results of site and intra-site level spatial analyses conducted to address Research Question 3.

Chapter 8, within which I interpret the results of analyses at Morton Village and discuss this study's broader contributions to coalescence research, concludes this dissertation. I also note other contributions of this research, outline its limitations, and suggest future research projects.

CHAPTER 2:

COALESCENT SOCIETIES IN ARCHAEOLOGY

In archaeological discourse, one of the first uses of the term *coalescent* occurred in 1954, when Don Lehmer created the Great Plains Coalescent Tradition. Lehmer argued that this tradition resulted from the merging of the Middle Missouri and Central Plains traditions, leading to a new archaeological culture that was an amalgam of the two (Lehmer 1954). While later work has indicated that this was not the case, the use of the term coalescent has continued to evolve over time and has since been linked to various multi-cultural social formations or those cases in which a blending of material traits is found (Kowalewski 2006). Beyond aggregation, or the co-habitation of separate groups to form a larger community, the coalescence process is socially transformative, as will be described below.

Today, the term *coalescence* is used, not as a label to denote general archaeological cases of mixing, but to describe a type of adaptive strategy and process in which different groups of people come together due to particular historical circumstances and begin to form integrated communities that help them to succeed within that context (Clark et al. 2019; Kowalewski 2006). Through archaeological and ethnographic evidence, the use of this strategy has been documented in a number of regions across the world and in a number of different human societies, giving rise to groups with distinctive identifying names, some completely different than the groups which formed them, like the Catawbas of the southeastern U.S., the Bororo of Brazil, the Zuni of the southwestern U.S., and others (Beck 2013a; Kowalewski 2006, 2007). For example, in the southeastern United States, many Native American Nations may have their roots in processes of coalescence, as European colonialism, slavery, warfare, disease, and many other disruptions during the 16th and 17th centuries eroded the hierarchical Mississippian chiefdoms that originally dominated this region of the country. Later, during the 18th century, smaller Native American social groups still inhabiting the region began coming together to form larger multi-cultural communities, such as the Catawba, the Creeks, or the Cherokee, which, as collectives with a common purpose, were better able to resist European incursions and successfully take part in shifting economies in the region (Beck 2013a; Ethridge and Hudson 1998).

Unfortunately, such coalescent events may in turn lead to new issues that must be overcome, including various scalar stresses, conflicts over leadership and land tenure, and negotiations of identity and power (Arkush 2017; Bandy 2004; Clark et al. 2019). Ethnographic cases in different areas of the globe, such as historic conflicts among the Kwaio of Malaita in the Solomon Islands (Keesing 1978) and the Siuai of Bougainville Island in Papua New Guinea (Oliver 1955), suggest that personal conflicts and feuds increase with larger population sizes, requiring the development of different leadership positions and social institutions designed to prevent group fission (Bandy 2004; Johnson 1982; Rappaport 1968). On top of this scalar stress, the coming together of people who may have different identities, different beliefs, and previously independent and established systems of leadership and status may also further increase social tensions (Birch 2013). In order for these amalgamations to build successful communities, mechanisms must be altered or created in order to manage conflict among the different parties involved, promote a sense of commonality and unity, and establish a mutually agreed upon or acceptable system of leadership that does not alienate certain parties in the relationship (Bandy 2004; Kowalewksi 2006). One example of this comes from the Arapesh-speaking town of Ilahita, located in northeastern New Guinea, which grew rapidly during the early 20th century as refugees and allies moved into the town during a period of intense conflict. During this time, leaders in Ilahita were able to integrate its growing multi-cultural population through the development of a complex moiety system and a primary ritual institution, both of which spread social and ritual obligations through different parts of the community and promoted community integration (Tuzin 2001).

Despite the particular historical circumstances of each case, Kowalewski (2006) has found that groups tend to utilize a restricted set of mechanisms to resolve these problems. These mechanisms include the creation of larger, often multi-ethnic towns; placing an importance on collective defense; moving communities into more sustainable and defensible positions; the intensification of local production and trade relationships; the formulation of social institutions meant to promote integration; the development of ideologies and myths that are more egalitarian; the creation of a built environment that promotes integration; and an emphasis on collective leadership (Birch 2013:10-11; Clark et al. 2019:266; Kowalewski 2006:117). In spite of the use of similar mechanisms, it is important to remember that each case of coalescence is unique, as people adapt to their particular historical, environmental, and social circumstances (Birch 2019). Some groups may use certain mechanisms and not others, and the way each mechanism is adapted will differ (for example, different case studies are not going to develop the exact same social institutions). It is also important to recognize that the process of forming a community does not happen immediately; instead, it may take generations before a commonly held group identity is formed, if at all (Birch 2013; Clark et al. 2019).

Research on coalescent societies has grown in the last few decades as archaeologists across North America have found increasing evidence for dynamic population movements and fluid social boundaries in the past (Alt 2006; Clark et al. 2019; Slater et al. 2015). In the Midwest, a renewed focus on population dynamics has demonstrated that movement occurred more frequently than previously thought and that it had direct impacts on numerous aspects of society. For example, recent research has changed our perceptions of the development of Cahokia, which was influenced by the movement of outside individuals or groups into the American Bottom region (Alt 2006; Hedman et al. 2018; Slater et al. 2015). After its emergence, Cahokia then influenced other regions of the Midwest, including the Illinois River valley and the Great and Little Miami Rivers region, through both population movement and the diffusion of ideas and practices (Bardolph 2014; Cook 2017; Price et al. 2007; Wilson et al. 2017). As evidence of these dynamics grow, archaeologists must generate a better understanding of the impacts of these different occurrences and how they restructured social life and culture, influencing later historical developments in the Midwest and many other regions of the world.

Within this context, coalescent societies, one possible outcome of shifting population dynamics, are important to consider as they provide an avenue through which archaeologists can explore how people of different social and cultural backgrounds come together to form and maintain a successful community. As Birch (2013:1-2) has argued, they offer a window into the development of "middle-range" communities, those that are bigger than incipient villages but are not yet urban centers, and the mechanisms people developed to negotiate life in these "larger, more complex social formations." As these coalescent communities formed the base from which later, larger social formations were created, it is critical to understand these communities and how they developed. This research can also contribute to broader discussions of migration and multi-cultural societies today (e.g. Clark et al. 2019), as archaeology provides a long-term perspective on how people organized and maintained multi-cultural communities, or failed to do so.

Coalescence, as a model of community development, also offers an agent-centered approach to understanding changes in community structure. As outlined by Kowaleski (2006, 2007, 2013), the coalescence model emphasizes that the results of population movement and subsequent aggregation were part of a negotiated process; the communities created by various parties, and the mechanisms used to bind them together, were generated through social negotiations conducted by different actors living within these communities. While imbalances of power may exist, all parties are still involved in these complex negotiations, and have an influence over the shape of subsequent social developments (Birch 2019; Kowalewski 2013). As part of its agent-centered approach, this model also emphasizes creativity and innovation, not just social and cultural reproduction (Kowalewski 2013). While many mechanisms used to bind new communities may have roots in past social formations, some practices may have been altered substantially or invented in order to fit within local needs and circumstances. By allowing for agency and innovation, this model adds more complexity to past understandings of community development, and helps to reveal the social complexities inherent in tribal or other types of social organization that do not show outward signs of inequality and are often seen as less complicated.

Yet despite a growing interest in coalescent societies, research on this topic is still relatively under-developed. For instance, few researchers have considered alternatives to coalescence, or how to differentiate these alternatives archaeologically. It would also benefit archaeologists to have a better understanding of the conditions that promote or deter coalescence, to explore what happens when coalescence fails and the reasons for such failure, to integrate multiple scales of analysis into their research design, and to engage more with broader theories of culture contact and change. Research on coalescent communities has also privileged the examination of higher order mechanisms, such as the development of corporate leadership structures, over the role played by everyday practices and interactions, which is the focus of this dissertation.

In past coalescence research, scholars have tended to focus on the built environment, the use of public spaces, objects of symbolic importance, and trade items in order to investigate the ways in which higher order mechanisms aided the coalescence process (Birch and Williamson 2013; Clark et al. 2019; Rodning 2013). While these higher order mechanisms are important aspects of coalescence and would have been critical for integration and alleviating political, social, and economic struggles, they do not provide a complete picture of the process. The act of building a community is not only perpetuated through these larger mechanisms, but also occurs through relationships forged through routine, everyday interactions.

Community and Coalescence

For this analysis, I rely on the interactionalist, practice-based perspective of community outlined by Yaeger and Canuto (2000). This perspective, unlike essentialist understandings of community, argues that communities themselves are entities that are socially constituted by the practices, decisions, and interactions of their members. As such, Yaeger and Canuto (2000:6) define a community as "an ever-emergent social institution that generates and is generated by supra-household interactions that are structured and synchronized by a set of places within a particular time span."

By design, this understanding of community is flexible, and allows for the development of different imagined communities, or cross-cutting social groupings, that tend to operate on different scales (O'Gorman 2010; Yaeger 2000). Due to these scalar differences, there are some variations in the interactions and practices that help to form and maintain these communities. Larger imagined communities, such as religious groups or clans, tend to link people together over a broader region. Since members of these groups are spread over a larger area and may not interact on a daily basis, membership is largely formed through things like shared beliefs and "practices of affiliation" (Yaeger 2000:126). At a smaller scale, such as the archaeological site or "village community" (O'Gorman 2010:577), daily interactions and practices are critical, as it is through these everyday interactions that members "develop shared premises or understandings, which can be mobilized in the development of common community identities" (Steidl 2020; Yaeger and Canuto 2000:6). In this way, common practices and objects are given added meanings and become links that build a sense of shared experience and commonality among village community members (Yaeger 2000).

Within this approach, material culture plays a crucial role. Instead of reflecting normative ideas shared by a village community, material culture and associated practices are understood to have formative capacities and are actively used to mediate relationships and form group bonds and identity (Lightfoot et al. 1998; Naum 2012; O'Gorman 2010, Peelo 2011). Through material culture, daily practices and interactions help to build the shared sense of commonality that, as discussed above, are key for forming a village community (Jaffe et al. 2017; Peelo 2011). As these relationships evolve, some of these practices and objects may be given more symbolic meaning than others, turning them into symbols of community membership and a means through which a community identity is formed and expressed (Yaeger 2000).

When applied to coalescent societies, this approach to community development and identity has serious implications for past and future research. As mentioned above, past research has largely taken a top-down approach to coalescence by focusing on institutions, ideology, and the construction of space. These mechanisms are one part of how communities are structured and built, but they cannot address the everyday, inter-personal interactions that are critical for the construction of local communities and the mitigation of potential conflicts. If, as argued by Yaeger and Canuto (2000), local communities and common identities are formed through frequent interaction and daily practice, then we must also consider these factors in order to understand specific cases of coalescence and create more accurate models of the process. In order to investigate interactions on this scale, I rely on concepts developed within hybridization and foodways scholarship.

Hybridization

While everyday interactions may be important for developing a sense of community, coalescence also involves a complex intermingling of different ideas, traditions, and cultures that must be navigated (Clark et al. 2019). In such cases, not only people, but also cultures are coming together and interacting, and a larger sense of difference must be overcome. Such environments, while generating problems like power differentials, can also lead to material, behavioral, and social changes as people are influenced by new ideas and ways of doing or thinking about things (Alt 2018). In order to better understand the emergence of new identities, behaviors, institutions, and objects that result from situations of intense culture contact, such as during coalescence, archaeologists and others have created a number of models meant to tease apart the complexities inherent in these situations (Card 2013a; Cusick 1998; Funari and Senatore 2015). These theoretical models, such as acculturation, ethnogenesis, creolization, syncretism, and others, have been heavily debated over the last few decades as archaeologists seek models that are better able to encompass the myriad interactions that occur during culture contact and that do not carry too much definitional or colonialist baggage (Card 2013b; Liebmann 2013). In recent years, hybridity is a term that has been applied as an alternative to the concepts listed above, as it offers a different way to approach the social and cultural impacts of culture contact (Card 2013b). While hybridity has its own detractors (Silliman 2015), I think it is a useful concept that helps to clarify how people in coalescent communities may have interacted with each other, negotiated social and cultural differences, and developed unique and effective ways to link different groups of people together. As will be discussed in more detail shortly, I do not use hybridity as a way to refer to mixed material culture styles, but as a transformational process through which different groups could negotiate differences and create or change social relationships. As such, it provides a theoretical basis from which archaeologists can move from identifying mechanisms used among coalescent communities toward explaining why and how people developed those mechanisms in particular situations. Hybridity, as a concept, also has certain advantages over previous terms used to explain shifts in material culture and behavior during culture contact, which are outlined below.

At its core, hybridity denotes a sense of "in-betweenness" (Van Dommelen 2005:117) and ambiguity inherent in situations of culture contact. Such ambiguity leads to active negotiations of difference in these spaces (Bhabha's [1990] thirdspaces), which are capable of generating altered beliefs, practices, and material culture (Liebmann 2015; Turpan 2013). Unlike previous terms, the concept of hybridity expresses the idea that such interactions are not one-sided, but influence all parties involved. Everyone in a community can take part in the negotiations of difference that occur, and in turn, all are affected by the outcomes (Alt 2006; Liebmann 2013). Hybridity also places more of an emphasis on innovation. These contexts, due to their ambiguity and fluidity, can lead not only to adaptation and borrowing, but also to the creation of entirely new social forms and objects that do not refer to past practices or material culture (Alt 2006, 2018; Stockhammer 2012).

While the concept of hybridity offers a new lens through which to view culture contact, its application has been heavily criticized (Palmie 2013; Silliman 2015). For many, the term "hybrid" itself is problematic, as it possesses racist undertones and, in the past, was used to imply a lack of racial purity. In a similar vein, it also implies the existence of "pure" cultures from which hybrid forms would arise, an outdated and inaccurate view of cultural dynamics. Definitionally, hybridity is also imprecise, as few specify what exactly a hybrid is, what (people, objects, practices, etc.) can become a hybrid, or when hybridity begins and ends. Due, in part, to this imprecision, the concept has been applied haphazardly, and in many instances has been used as a catch-all term for cultural mixing with little interpretive power. Some scholars also question whether or not the concept can be divorced from its roots in post-colonial theory. Can hybridity be applied to any number of situations involving culture contact, or should it be restricted to colonial spaces with a clear imbalance of power?

Despite these criticisms, if defined clearly and used critically, I find that the concept of hybridization still offers a useful framework for understanding the interactions and relationships negotiated in situations of culture contact. In order to move beyond many of these critiques, I use a modified version of Liebmann's (2015:322) conceptualization of hybridization. For this analysis, hybridization is defined as the practice of creating new elements or modifying past elements from two or more different social groups in ways that transform pre-existing relationships. I use the word hybridization over hybrid or hybridity in order to emphasize that what is being discussed here is an overall process of interaction and negotiation among participants, not just blended objects (Van Dommelen 2005). As stated above, hybridization goes beyond previous concepts of culture contact by declaring that all parties involved have direct influence over the outcomes of social negotiations and that innovation, not just mixing or reproduction, is a possible result. It is also important to note that this definition does not assume the presence of essentialized "pure" cultures, but only that cultural differences between groups existed. As suggested by Silliman (2015) and Liebmann (2013, 2015), this definition also holds onto the agent-centered transformational nature of hybridity as conceived of in post-colonial theory. While I de-emphasize the particular focus of post-colonial hybridity on imbalances of power, I retain the idea that hybridization is transformational and empowering, and is a strategic mechanism through which people could negotiate differences and challenge old norms. While the colonized can use hybridity as a challenge to binary classifications and as a space for resistance (Bhabha 1994), people and groups on a more equitable footing may have used hybridization as an active means of reconfiguring differences and re-working social relationships.

Following Bakhtin (1981) and Liebmann (2015:323-324), hybridization can be divided into two general types: organic hybridity and intentional hybridity. Organic hybridity, the most common form of hybridization, is the natural, inadvertent borrowing and mixing that occurs as people interact on a regular basis, and is not the byproduct of strategic decisions. Intentional hybridity, on the other hand, results from intentional choices made by agents with a certain goal(s) in mind. While these two categories are well defined, they are not entirely mutually exclusive, as objects and practices can move from being organic to intentional (and then back again) if their use becomes a deliberate, conscious decision on the part of those participating. Through this division, these ideas help to lend interpretive power to the concept of hybridization, as they allow for the definition of different types of interactions within these spaces, as well as an avenue for exploring the roles played by different types of material culture.

Foodways

Since as early as the late 19th century, anthropologists and other social scientists have been interested in food and food practices among human groups (Dirks and Hunter 2012; Long 2012; Mintz and Du Bois 2002). Early on, research projects focusing on food sought to investigate dietary and subsistence patterns, understand how people met caloric and nutritional needs, and explore food and social behaviors from a functionalist perspective (Dirks and Hunter 2012; Twiss 2012). During the 1960s and 1970s, while many anthropologists investigated the ecological or structural underpinnings of food systems (Dirks and Hunter 2012), scholars in folklife studies began to examine food from a different angle, choosing to focus on the "context and processes surrounding the performance" of food instead of the food itself (Long 2012:222). Within this shift, Don Yoder (1972) made popular the term foodways, which was defined as "the totality of practices and beliefs surrounding eating and food" (Long 2012:222.). This different approach to food, alongside an increase in post-modern and post-processual approaches in anthropology and other fields, led to an expansion in how archaeologists and others approached food research in the 1980s and 1990s. In particular, archaeologists began to place more of an emphasis on exploring and understanding how different social aspects, such as gender systems, social identity, ideology, and politics, were entangled with food traditions in the past (Hastorf 2017; Peres 2017; Twiss 2012). This expansion of the scope of food research has led to a diversity of theoretical and methodological approaches to the topic, including a continued growth in the application of the concept of foodways (Twiss 2012).

Foodways, as an avenue of analysis, is defined in this dissertation as the exploration of the ways in which the production, preparation, consumption, and even discard of food is entangled with larger social processes, such as identity, politics, and religion. It also emphasizes the individualized nature of each of these steps; how each part of the process of food creation and consumption interacts in unique and complex ways with larger social processes (Hastorf 2017; Peres 2017; Twiss 2012). Since everyone needs to eat in order to survive, food is one of the few aspects of life that is ubiquitous among all human groups. It is also infinitely malleable, as there are many different ingredients, as well as ways to prepare, combine, and consume them. While the presence of food is ubiquitous, access to the same types and quantities of food is not. Because of this fact, food is particularly suited to cultural elaboration, and has become a potent cultural and social symbol (Rodriguez-Alegria and Graff 2012; Twiss 2007a). Archaeologically, the production, preparation, and consumption of different foods is visible in many ways, which can be used to understand the roles food played among societies in the past (e.g. Chase 2012; Joyce and Henderson 2007; Rodriguez-Alegria 2005).

While foodways can be used to study a number of topics in archaeology, it is commonly used to understand the ways in which people used food to create relationships and establish social boundaries (Graff 2018; Jaffe et al. 2017; Peres 2017; Rodriguez-Alegria 2005; Twiss 2007b, 2012). Like today, meals serve as events where people can come together to share resources, socialize, and create or maintain social relationships. Meals also become part of shared traditions, as participants are able to celebrate mutual taste preferences and beliefs in what is good to eat, as well as partake in common practices and rituals, creating bonds between people (Hastorf 2017; Hastorf and Wiesmantel 2007). These relationships can be formed at numerous scales, from everyday meals shared by a family group to larger feasts incorporating a whole village, or somewhere in between (Atalay and Hastorf 2006; Kassabaum 2019; Kuusela 2018; Hastorf and Weismantel 2007). Within this locus of sociality, food and meals are also involved in the formation and negotiation of social identities (Bardolph 2014; Farnsworth 2001; Hastorf 2017; Tuomainen 2009), which further help to link people together.

Social identity is a perceived sense of belonging to a larger group, such as religious, class, gender, or ethnic communities, in relation to the exclusion of others. At its simplest, it is an "us" versus "them" characterization that helps to create an individual's sense of self and their place in the broader world around them (Gosselain 2000; Hastorf 2017). It also helps to forge community ties, as people come together around common practices or symbols and a shared sense of belonging. The creation of these perceptions is a dynamic process that is actively negotiated and is often embodied through daily practice and material culture (Gosselain 2000; Voss 2005; Wynne-Jones 2007). In many instances, certain objects and practices become the medium through which particular identities are established, maintained, and advertised, such as the role of cowboy hats and boots within a Texan identity.

Another medium through which identities are formed and negotiated is food. In many cases, food is used to create, define, and manipulate social and cultural boundaries through choices that are made on a regular basis. Food practices become visible markers of shared traditions, as well as shared memories and connections, which serve to create a sense of community and differentiate members of that community from outsiders (Hastorf 2017; Twiss 2007a; Weller and Turkon 2015). These visible practices can include eating (or not eating) certain types of food or particular symbolic dishes, using specific preparation techniques, practicing specific consumption traditions, or many other ways of manipulating food and food practices (Bardolph 2014; Jaffe et al. 2017; Kirch and O'Day 2003; Thomas 2007). While these practices can come to define social groupings, the relationship between people and food is always under negotiation. As a result, social boundaries created by food are fluid and can be influenced by multiple factors (Crowther 2013; Twiss 2012).

Cooking, the focus of this dissertation, is deeply involved in these negotiations, despite its quotidian status. Cooking, defined here as the creation of desirable physical and chemical transformations in ingredients through purposeful changes in temperature, moisture, pH, and other physical attributes (Wandsnider 1997), turns ingredients into edible and socially acceptable foodstuffs, which in turn become important social symbols (Graff 2018; Morrison 2012; Rodriguez-Alegria and Graff 2012). Subsequently, cooking is a critical process through which social decisions are made; cooks, through their labor in the kitchen, are able to enact certain social strategies, such as emphasizing traditional foods or incorporating new ingredients or methods, that can be used to affirm or challenge current perceptions of identity (Morrison 2012). This is true not only at larger communal meals or feasts, but during everyday meals as well. Common meals serve as nexuses of identity construction, as children and other participants learn and consume the foodways traditions that become symbols of certain identities (Hastorf 2012). These learned traditions of practices and taste connect them with past family members, as well as a larger network of people that share similar traditions, serving to reinforce a sense of belonging and identity (Bajic-Hajdukovic 2013).

Recently, cooking has become a greater focus of archaeological research, including advances in the methods used to examine cooking and other food processing techniques (Graff 2018; Haas 2019; Jaffe et al. 2017; Kooiman 2018; Rodriguez-Alegria and Graff 2012). While different methods exist to approach cooking in the past, this dissertation focuses on the analysis of ceramics. As will be discussed in more detail in Chapter 4, the use of pottery for different tasks over time, especially cooking, can leave visible markings on vessels, such as scratches, pitting, or burned on food residues. These use-alteration traces are one of the few lines of evidence that provide direct evidence of cooking, food presentation, and other food practices, which can be used to help recreate the food traditions of past groups (Skibo 2013). By focusing on ceramics and cooking, this research also moves towards understanding how items were turned into culturally acceptable dishes, allowing us to go beyond diet to consider other aspects of cuisine (Graff 2018; Morrison 2012).

Through use-alteration analyses of ceramics, as well as complementary spatial analyses, researchers can create a greater understanding of past food traditions, and track how those traditions have changed over time and in different social contexts. Similarly, comparisons of use-alteration data from pre-migration sites to locations of post-migration coalescence can detect changes in cuisine and food practices that may relate to the social negotiations that were on-going at these sites as a part of the coalescence process.

Foodways, Hybridization, and Coalescence

Combined, foodways and hybridization provide a useful framework for investigating the importance of daily interactions within coalescence. Food and cooking, socially important daily practices, can serve as critical loci of interaction and negotiation for groups of different backgrounds (Bardolph 2014; Jaffe et al. 2017; Kuusela 2018; Stein 2012; Sunseri 2015). For example, it can be hypothesized that sharing resources and food during meals and feasts could have been one way to bring people together and interact, over time building shared traditions of commensality. Negotiations of cultural difference and identity also may have been aided by the hybridization of practices, cooking techniques, tastes, events, and meanings, helping the different social groups to create a common cuisine and shared traditions and experiences. Some food practices likely would shift organically as residents interacted, while other changes were purposefully altered or created for the express purpose of forging alliances and community bonds, relationships critical for promoting cooperation, the defense of the community, the appropriate management of resources, and many other practical concerns. Over time, these collective changes could be translated into a new community identity as coalescence occurs. Alternatively, changes to foodways practices could be made that exacerbate cultural differences or seek to empower one subset of the community over others, leading to breakdowns in productive negotiations and the eventual dissolution of the community as a whole.

Importantly, this framework is also compatible with archaeological data, as food remains, cooking practices, and other aspects of food traditions can be identified and traced through time (Cuellar 2013; Kooiman 2016, 2018; Thomas 2007). Negotiations through hybridization of food practices will leave visible material signatures, such as the development of new cuisines or the adoption of mixed or new material culture, which are the result of both organic and intentional hybridity (Card 2013b; Liebmann 2015; Williams-Forson 2014). These changes can be detected archaeologically by conducting comparative analyses of material culture patterning at appropriate sites, such as coalescent and pre-migration occupations. While different methods could be used to track changes in practice, this dissertation focuses on ceramic use-alteration traces, as these markings provide direct evidence of the different ways food was cooked in the past.

Summary

In this chapter, I have introduced the concept of coalescence and argued, through the application of an interactionalist perspective of community, that it is important to consider not only larger societal mechanisms but also everyday practices and interactions when examining coalescence. This consideration is important because it allows archaeologists to create a more complete picture of coalescence and also indicates the importance of looking at the coalescence process at multiple scales. In order to examine everyday behaviors and their role in coalescence, I investigate changes in food practices, specifically cooking and consumption traditions, and their relationship to social interaction and identity. To approach this topic, I rely on the theoretical tenets of foodways and hybridization scholarship, which help to establish the link between sociality and food and promote a model of culture contact, interaction, and negotiation that contextualizes shifts in foodways and the development of new practices. Using this theoretical base, I address the research questions introduced in Chapter 1 by examining vessel function at Morton Village, the case study for this dissertation, as well as at two pre-migration comparative sites, Larson and the Tremaine Complex. This analysis will detect differences in foodways practices from pre- to -post-migration contexts that may have played a part in the coalescence process. The next chapter, Chapter 3, provides a detailed background of Morton Village and the two comparative sites, while Chapter 4 re-introduces my research questions and outlines the methods used to address them.

CHAPTER 3:

ARCHAEOLOGICAL BACKGROUND

In order to explore the role of cooking and foodways practices in the process of coalescence, I will use the Morton Village site as a case study. Located in the central Illinois River valley (CIRV), Morton Village is a multi-ethnic village, dated to cal. A.D. 1300-1400, that was occupied contemporaneously by migrant Oneota and local Mississippian groups (Bengtson and O'Gorman 2016; Santure et al. 1990). While research is only beginning to explore coalescence at this site, I consider Morton Village to be a community that was in the process of coalescing because of the presence of a multi-cultural population, a built environment not typical of towns in the CIRV, the evidence of the use of mortuary symbolism for identity negotiation, and other lines of evidence that will be outlined below (Bengtson and O'Gorman 2016; Conner et al. 2014). As will be discussed in more detail, Morton Village has also been the focus of two large archaeological projects, which have generated a great amount of artifactual and spatial data. Combined, the great amount of data and evidence for coalescence make Morton Village an appropriate case study for this research project.

In order to identify and document how foodways patterns at Morton Village may have changed as a result of coalescence, data from two comparative sites, Larsen and the Tremaine Complex, were also collected (see Figure 3.1 for site locations). These sites were chosen as they both provide information on the pre-migration cooking and foodways traditions of the migrant and local populations at Morton Village. As will be discussed in more detail below, Larson is a Mississippian mound center, located just a few miles away from Morton Village in the CIRV, that was occupied just prior to the migration of Oneota groups into the region (Conrad 1991;

Harn 1994). It was selected because it provides an ideal picture of regional CIRV Mississippian cooking and foodways traditions just prior to the Bold Counselor Phase. Larson was also the focus of large-scale excavations in the 1960s and 1970s, which recovered a large ceramic assemblage with good contextual information (Harn 1994), providing a sizable comparative data set through which foodways patterns at the site could be examined.

While a clear antecedent to the Mississippian populations living at Morton Village could be found, an Oneota comparative sample was not as readily available. Unfortunately, the origins of the Oneota populations that migrated into the CIRV are currently unknown. Because of this, I chose to examine a data set contemporary with Morton Village from the Oneota heartland in the Upper Midwest that might be representative of larger foodways practices within the Oneota Tradition. Located in the La Crosse Locality in Wisconsin, the Tremaine Complex was a focused area of Oneota occupation, partially contemporaneous with Morton Village, within a region possessing a long history of Oneota activity (Boszhardt 1994; O'Gorman 1995; Rodell 2000). As with Larson, the Tremaine Complex has been the subject of large-scale excavations (O'Gorman 1993, 1994, 1995), generating a large and well-provenienced assemblage of Oneota ceramics from which information regarding Oneota foodways practices could be gathered. Unlike Morton Village and Larson, where single-family households were common, households at the Tremaine Complex were organized into multi-family longhouses. As it is unknown how households among Bold Counselor Oneota migrants were organized before this migration event, differences in household structure may complicate foodways comparisons between the sites.

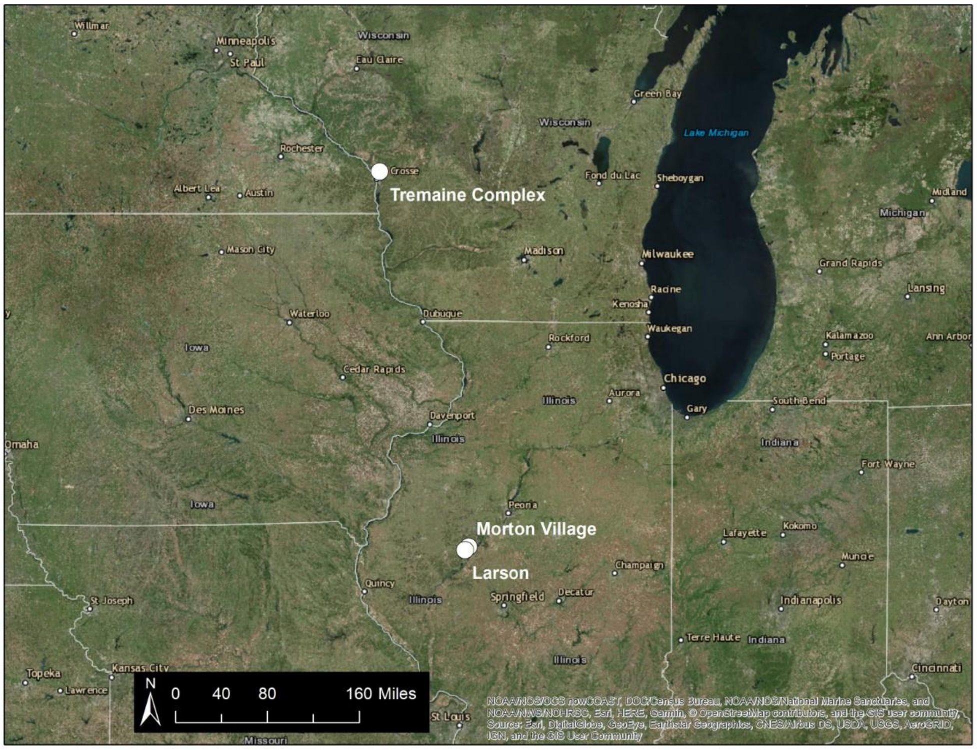

Figure 3.1. Map showing the location of the sites examined in this dissertation. Made using ESRI ArcGIS.

The remainder of this chapter situates this research within its culture-historical context in more detail and reviews background information for the three sites analyzed in following chapters. It begins with a broad overview of the Oneota and Mississippian traditions, and then focuses on the central Illinois River valley and the history of archaeological research at Morton Village. Finally, information regarding the comparative sites is introduced.

Brief Overview of the Oneota and Middle Mississippian Traditions

During late prehistory, the Prairie Peninsula of the Midwest was occupied by two major archaeological traditions: Oneota and Middle Mississippian. The Oneota Tradition is found primarily in the western Great Lakes region and the Upper Mississippi River Valley, extending out into the eastern edge of the northern Great Plains. Middle Mississippian occupations, on the other hand, are found throughout the southeastern U.S. and along the central and southern Mississippi River and its tributaries (Schroeder 2004). Although these traditions are largely geographically distinct, outlier sites exist that document occupations of these groups outside of their typical regions (Birmingham and Goldstein 2006; Fortier et al. 2006; Pauketat et al. 2015).

While the origins of the Oneota Tradition are still debated, Oneota material culture appears in the archaeological record around A.D. 1000, possibly originating from Late Woodland roots (Overstreet 1997; Rodell 1997; Theler and Boszhardt 2006), and continued into the historic record (Boszhardt 1998; Brown and Sasso 2001; Henning 1998). Communities within this tradition are often described as tribal societies (O'Gorman 2010; Schroeder 2004) that shared various material culture traits, including distinctive ceramic designs composed of trailed lines and punctations (Boszhardt 1994; Henning 1998; Overstreet 1995). They also appear to have shared a broad subsistence regime that was seasonally varied and included a dependence on agriculture as well as wild plants and animals, which allowed them to successfully adapt to a region that can be climatologically unpredictable (Gallagher and Arzigian 1994). To enhance such a system, Oneota groups lived in relatively settled, nucleated villages, typically on terraces adjacent to major rivers or next to lakes and wetland areas that provided access to varied ecological communities as well as adequate agricultural soil (Gallagher and Arzigian 1994; Sasso 1993; Schroeder 2004). These villages were moved on a regular basis, and the potential for seasonal mobility in the form of long distance hunting forays or resource extraction trips has been suggested (Boszhardt and McCarthy 1999; Henning 1998).

Alongside these general characteristics, past research has demonstrated a number of time-transgressive trends among Oneota communities, such as shifts in ceramic styles and other material culture (Boszhardt 1998; Henning 1998; Overstreet 1995), changes in the form of residential structures and social organization (Hollinger 1995), an increasing reliance on certain resources like bison (Boszhardt 2000; Ritterbush 2002), and a geographical pattern of westward movement toward the edge of the plains (Ritterbush and Logan 2000; Sasso 1993). These trends have been used to divide the Oneota tradition into four horizons: Emergent, Developmental, Classic, and Historic (Henning 1998). While these broad patterns have been important for understanding social and culture-historical changes among Oneota groups, they also mask variation present within these horizons and between different Oneota communities (Egan-Bruhy 2014; Overstreet 1997; Painter and O'Gorman 2019).

To the south, communities within the Middle Mississippian tradition (hereafter referred to only as Mississippian) also began to appear around A.D. 1000. Similar to the Oneota, the processes that gave rise to Mississippian polities are still debated. Some argue that Mississippian polities arose from internal competition within and interaction between tribal Late Woodland groups (Schroeder 2004; Knight 1990), while others emphasize the role of religion, population movement, and the negotiation of cultural contact in inspiring the development of Mississippian practices and lifeways (Alt 2006; Pauketat and Alt 2015). Recent research also underscores the historical nature of Mississippian polities, indicating that there was no singular "Mississippianization" process, but instead a diversity of events and entanglements that created different communities across the southeast (Cobb 2005; Wilson and Sullivan 2017:2). While Mississippian communities may have been more diverse than previously thought, Mississippian groups still shared several broad traits, including social organization, a settlement/subsistence system, many aspects of material culture, and the exchange or emulation of a restricted set of special objects and object styles (King 2007; Milner 2004; Schroeder 2004; Smith 1985).

Mississippian communities were organized into chiefdoms and relied heavily on agriculture to meet their dietary needs (Beck 2003b; Smith 1985; Simon and Parker 2006). Unlike the Oneota, many Mississippian groups lived in large, permanent towns located in or adjacent to river valleys, which were organized around a central mound and plaza complex. Dispersed around this center were smaller villages and isolated hamlets, which allowed people to farm and extract resources from larger areas while still being relatively close to the main town (Smith 1985). People living in these towns used a large variety of ceramic vessels, tempered with ground shell, and built houses using a wall-trench construction technique (Alt and Pauketat 2011; O'Brien 1972), but not everyone had access to the same resources. Elite members of the community often ate greater amounts of meat than others and had greater access to more desirable parts of animals, as well as exotic items and ritual paraphernalia (Blitz 1993; Jackson and Scott 1995, 2003; Wilson 1999). Although still debated, Mississippian towns may have also housed craft specialists, who produced fine objects instead of focusing on food production (Pauketat 1997). Towns and their elite were linked by a wide trading/interaction network, through which raw and finished goods were exchanged and social relationships were built and maintained (Brown et al. 1990; Trubitt 2000). While Mississippian communities commonly shared these traits, similar to the Oneota, grouping these communities under the umbrella term "Mississippian" blankets a large amount of variation (Bardolph 2014; Blitz 2010).

In recent years, research has demonstrated that migration or other forms of population movement were common among Mississippian and Oneota populations (Cook and Price 2015; Esarey and Conrad 1998; Price et al. 2007; Ritterbush 2006; Ritterbush and Logan 2000; Rodell 2000; Slater et al. 2015), leading to interactions between these two groups and with other people. Specifically, Oneota and Mississippian groups came into contact in a region stretching from southeast Minnesota into southern Wisconsin and northern Illinois. Resulting interactions varied. In the Red Wing locality of southeast Minnesota, contact between Oneota and Mississippian groups may have occurred, leading to shifts in behaviors and material culture. Some suggest that an "amalgam resulted from the transformation of a resident Oneota population through Mississippian contact" in this region (Gibbon and Dobbs 1991:302), while others argue that interactions between local Late Woodland groups and Mississippian influences, perpetuated by either actual migrants or long-distance exchange relationships, directly led to the development of Oneota culture in the region (Rodell 1997). Recent research has begun to question these earlier interpretations, indicating that the Red Wing area was a center of social interaction between a number of groups, with little clear evidence for direct Mississippian contact. Instead, Mississippian influences may have diffused into the region through other groups, having minimal impact on local cultural developments (Henning and Schirmer 2020).

Unlike the Red Wing locality, differences in the use of plant resources between eastern and Mississippi Trench Oneota groups in Wisconsin suggest that Mississippian influences along the Mississippi River impacted the subsistence regime of those Oneota groups. An analysis by Egan-Bruhy (2014) found that Mississippian Trench Oneota groups relied more on maize and Eastern Agricultural Complex plants, a diet more similar to Mississippians to the south, compared to eastern Oneota groups that focused more on wild plants. These differences may indicate that interactions with Mississippian groups at Red Wing, Trempeleau, and elsewhere along the Mississippi River influenced the diet and food production strategies of Mississippi Trench Oneota groups (Egan-Bruhy 2014).

In eastern Wisconsin, opposite interactions may have occurred. Based on a short gap in radiocarbon dates at some eastern Wisconsin Oneota localities, it has been suggested that, upon the appearance of a Mississippian group at the site of Aztalan, Oneota groups were temporarily pushed north, south, or west, by Mississippian and local Late Woodland groups (Overstreet 1997). While possible, a lack of Oneota sites in general in southeastern Wisconsin, aside from around Lake Koshkonong, and a high occurrence of Late Woodland sites suggest that Oneota occupation may have been prevented prior to Aztalan due to the presence of Late Woodland groups already occupying the region (Goldstein and Richards 1991). More recent radiocarbon dates (Sterner and Jeske 2017:64) also demonstrate that some Oneota localities, such as Lake Koshkonong, were not abandoned, but were occupied contemporaneously with Aztalan. In terms of lifeways, Mississippian influences on Oneota behavior, diet, and material culture are much less common in eastern Wisconsin compared to western Wisconsin groups (Egan-Bruhy 2014; Overstreet 1997), indicating that those to the east chose to avoid Mississippian groups or emphasize their differences. Interactions between, or the avoidance of, Oneota and Mississippian populations also occurred farther south, such as in the central Illinois River valley, which is the focus of this dissertation.

Archaeology in the Central Illinois River Valley

The central Illinois River valley (CIRV), located in west-central Illinois, is a 210 km section of the Illinois River that stretches from modern day Hennepin south to Meredosia (Harn 1994). Differentiated from the lower and upper sections of the Illinois River valley by hydrologic, topographic, and biological variations, the CIRV is a wide section of the Illinois River valley shaped about 15,000 years ago by glacial floodwaters (Harn 1994; Harn and McClure 2012). The valley is bordered on the east and west sides by tall bluffs that are regularly dissected by smaller tributary streams, and is an ecologically rich region containing numerous ecological communities that vary horizontally and vertically. In the past, the uplands adjacent to the CIRV contained patches of hardwood forest and prairie, as well as an area of sand prairie containing relict dunes and unique floral communities. On bluff slopes, floral communities transitional between the uplands and the river bottom were present. In the valley bottom, the landscape was commonly forested, with species such as maple, elm, and ash being predominant. Large stands of pecan, black walnut, and other important tree species were also present. Alongside forest patches, sections of prairie and wetland were also found in the valley bottom. All of these different plant communities provided habitat for a number of animal species, including deer, elk, raccoons, turkeys, and other important prey species. In the river bottom, backwater lakes, smaller tributaries, and the main channel of the Illinois River all provided access to aquatic species. Due to its position within the Mississippi Flyway, the CIRV is also a major route for migratory birds, which were seasonally abundant and offered another reliable source of food. Finally, soils in the region, especially along the bluff tops, are of good quality for agriculture (Harn 1980, 1994). All of these aspects make the CIRV an ideal location for human habitation, and the archaeological record in the region reflects this fact, providing evidence of human activity in the region ranging from the early Paleoindian Period into modern times (Harn and McClure 2012).

While occupied for thousands of years prior, Mississippian populations first appeared in the CIRV around A.D. 1050-1100. Just years before, the CIRV and surrounding areas were occupied by different Late Woodland groups, such as Maples Mills and Bauer Branch, who had occupied the valley since A.D. 900 or earlier (Conrad 1991; Esarey 2000; Green and Nolan 2000). With the growth of the Mississippian center of Cahokia to the south around A.D. 1050, Mississippian influences began to spread north along the Illinois River into the CIRV (Conrad

1991; Harn 1991). While it is still debated if changes were the result of population movements or the emulation of Cahokian practices (Bardolph 2014; Harn 1991; Steadman 1998; Wilson et al. 2017), by around A.D. 1100 distinctly Mississippian material traits, such as ceramic styles, wall trench structures, and elements of ritual practice, appear in the archaeological record of the CIRV at sites such as Eveland (Harn 1991). People in the CIRV then continued to develop their own unique version of the Mississippian lifeway for the next two centuries.

The Mississippian period in the region has been broken down into four phases based primarily on ceramic seriation data (Esarey and Conrad 1998; Conrad 1991; Wilson et al. 2018). While in need of further refinement (Wilson et al. 2018), these phases are: Eveland (A.D. 1100-1200), Orendorf (A.D. 1200-1250), Larson (A.D. 1250-1300), and Crable/Bold Counselor (A.D. 1300-1425) (Esarey and Conrad 1998). During these phases, people utilized a dispersed settlement system centered on larger, walled temple towns, buried their dead in cemeteries or burial mounds along the bluff tops, and relied on both agriculture and wild resources for food (Harn 1980, 1994; Conrad 1991; Tubbs 2013). Multiple Mississippian temple towns were located in the CIRV, with the possibility that some of these were sequentially occupied or simultaneously occupied by different groups (Conrad 1991). There is also evidence that Mississippians in the CIRV took part in wider trading networks that brought exotic goods into the region, connecting them to other communities (Conrad 1991; Harn 1980; Washburn et al. 2014).

Around A.D. 1300, Oneota people began to migrate into the already occupied CIRV (Esarey and Conrad 1998; Santure et al. 1990; Steadman 1998). Designated as the Bold Counselor Phase, their presence is evidenced by the appearance of single post structures, distinctive Oneota ceramics, humpbacked scrapers, and burial goods characteristic of the Oneota

(Esarey and Conrad 1998; Santure et al. 1990). At least five Bold Counselor village sites have been identified in the CIRV, with sites possibly differing in the composition of their populations (Esarey and Conrad 1998). Relations between the local Mississippians and migrant Oneota are still under investigation. Unfortunately, most Bold Counselor sites have seen limited excavation or only surface collections, making it difficult to assess how the migrants and locals interacted across the CIRV. A recent multi-layer network analysis of ceramics from the region (Upton 2019), which addresses social relationships at a broad scale, is able to provide some information regarding these interactions. Upton (2019) found that the in-migration of Oneota people into the area caused a breakdown in regional-scale social networks that existed prior to this migration event. It was also found that sites with high levels of Oneota ceramics tended to cluster, indicating closer relationships with other Oneota sites. This evidence suggests that, while interactions did occur, the Oneota migrants were not entirely incorporated into the larger social sphere. While most Bold Counselor sites are not well known, one site complex, Morton Village and the Norris Farms #36 cemetery, has been the location of extensive excavations, providing a data source from which to investigate the interactions between locals and migrants at a smaller scale. As such, Morton Village is the focus of this research.

Morton Village and Norris Farms #36

Located on the western bluff in Fulton County between the modern towns of Havana and Lewistown, IL, Morton Village (11F2) and Norris Farms #36 are a Bold Counselor village and associated cemetery dated to around cal. A.D. 1300-1400 (Esarey and Conrad 1998; Santure et al. 1990; Silva et al. 2014). Morton Village was first identified during University of Chicago surveys during the early 1930's, but was not investigated through excavation until the 1980's.

For decades, the site was used as pasture land and then a cattle feedlot, until proposed Highway 78/97 improvements and the dismantling of the feedlot provided an opportunity for archaeologists to investigate areas of the site that were to be impacted. In 1983 and 1984, small-scale excavations and reconnaissance surveys conducted by Dickson Mounds Museum staff investigated a small portion of the village, and also identified the presence of Norris Farms #36 cemetery for the first time. These findings spurred large-scale excavations in 1984 and 1985 along the right-of-way of Highway 78/97, which intersects the eastern part of Morton Village. To prevent destruction through erosion of the bluff bank and the inevitable looting of Norris Farms #36, the entire cemetery was also excavated during this time. Further excavations in the village area were conducted in 1986 and 1988 by Dickson Mounds Museum/Illinois State Museum staff, as other small construction projects arose (Santure et al. 1990). From 2008 to 2017, a long-term joint research project led by Jodie O'Gorman at Michigan State University and Michael Conner at Dickson Mounds Museum conducted excavations at Morton Village in order to further explore the village and better contextualize the results of earlier excavations, specifically those at Norris Farms #36 (Bengtson and O'Gorman 2016; O'Gorman and Conner 2015). During this recent work, both widespread excavation and magnetometry survey have greatly expanded knowledge of site details and have generated a more representative sample of archaeological materials from the village.

Through these excavations, a great amount of data relating to this occupation has been recovered. During the earlier excavations conducted by the Dickson Mounds Museum/Illinois State Museum, at least 11 structures and numerous pit features were excavated or documented at Morton Village. Both Oneota and Mississippian structures and material culture were recovered, and these were interpreted by the excavators as two separate components at the site (Santure et al. 1990). Though sample sizes were small, evidence of typical every day behaviors, such as tool production, cooking, and food production were recovered for both components (Harn and Klobuchar 2000; Schroeder 2000; Santure et al. 1990). Limited faunal and floral data suggest that the site was occupied seasonally from late spring to early fall, but more analysis is necessary to verify this argument (Styles and King 1990:65). Evidence of broad interactions between Oneota and Mississippian people were also recovered, such as hybrid and trade vessels found in the village and associated cemetery (Santure et al. 1990).

While excavations at the village presented evidence of common tasks performed during village life, the excavation of the Norris Farms #36 cemetery provided a much different picture of life at Morton Village. Determined to be an Oneota cemetery linked to Morton Village through proximity, radio-carbon dates, stylistic similarities, and the appearance of burial objects commonly associated with Oneota groups, many of the 264 interred individuals showed signs of poor health and violence (Milner and Smith 1990; Milner et al. 1991; Santure 1990). 42% of adults (19% of the burial population) appear to have suffered violent deaths, while a large majority also showed signs of biological stress, such as disease or poor nutrition (Milner and Smith 1990; Santure 1990). Coupled with faunal and floral data from the village, which based on small sample sizes suggested a restricted diet largely focused on maize and other cultigens (Styles and King 1990), this evidence of violence and poor health led Santure et al. (1990) and Milner et al. (1991) to interpret the village as a place of conflict and fear, where people were generally restricted to the village due to the threat of raiders.

After geophysical surveys and the partial or entire excavation of at least 38 more structures and 211 more features, recent work by O'Gorman and Conner have further explored what life was like at Morton Village. Field work across the site area has revealed a sprawling village made up of both wall-trench and single-post rectangular structures, with no discernable plaza complex similar to earlier Mississippian sites in the area. Two areas containing ritual/public structures, one associated with the Oneota and one with Mississippians, have also been located (Bengtson and O'Gorman 2016). Based on new radiocarbon and artifactual data, it is argued that, instead of two distinct components, Mississippian and Oneota populations lived at Morton Village contemporaneously, at least for part of the village's history (Silva et al. 2014). Such direct interaction and cohabitation likely had a great impact on the lifeways and behaviors of those involved, and is a topic currently under investigation (Bengtson and O'Gorman 2016; Painter and O'Gorman 2019).

In recent years, research has begun to shift towards considering Morton Village as a location where coalescence was in process. A few different lines of evidence suggest this is the case. Both material culture (Bengtson and O'Gorman 2016; Leito and O'Gorman 2014; Santure et al. 1990) and population genetics studies (Steadman 1998) indicate that Morton Village was the home of a multi-cultural population, a necessity for coalescence to occur. Recent research has also indicated that Morton Village had a built environment different from typical large towns in the CIRV (Bengtson and O'Gorman 2016), that residents constructed large special purpose structures that may have served an integrative purpose (O'Gorman and Conner 2016), and that identity negotiations through mortuary symbolism and shifts in diet and foodways practices were occurring (Bengtson and O'Gorman 2016; Painter and O'Gorman 2019; Tubbs 2013). This evidence points to complicated processes at work in the community that are typical of coalescent societies and would have helped to integrate migrant and local populations into a viable community. Overall, life at Morton Village was complex, as people tried to negotiate life in a multi-ethnic community while also dealing with the consequences of violence and conflict.

Diet and Cuisine Prior to and During the Bold Counselor Phase

While a large amount of excavation has occurred on late prehistoric sites in the CIRV, little comprehensive research has been done on subsistence and cuisine and few published data sets exist (Conrad 1991). As such, only a general outline of diet in the region is known. Beyond diet, very little information regarding other food practices is available.

Unfortunately, very limited subsistence information is available for the Eveland Phase, the earliest period of Mississippian occupation in the CIRV. Recent research on botanical remains from this period has shown that people increasingly grew maize and other agricultural products as Mississippian influences spread north into the region, coupled with a concomitant decrease in the use of nuts. While agriculture was becoming increasingly important, exploitation of wild plants was still an important component of the diet (VanDerwarker et al. 2013; VanDerwarker and Wilson 2016). Very little is known about faunal exploitation during this time, but preliminary analyses of small data sets suggest that fish and mammals, both readily available in the region, were main dietary sources (Conrad 1991; VanDerwarker and Wilson 2016).

Similar to changes seen in diet, research by Bardolph (2014) has found evidence for a slow transition in food practices as Late Woodland groups in the region transitioned into a more Mississippian lifeway. Ceramic assemblages from this time suggest that outward stylistic elements of Cahokian ceramics were adopted by local groups in the CIRV, but that they continued to prefer using multi-purpose jars and had not yet adopted the large variety of serving and food presentation wares common farther south. Local groups also continued to use large, communal cooking facilities, such as roasting pits, which were common during Late Woodland phases, instead of more individualized cooking methods. While some visible signs of Cahokian practices had been adopted, previous food traditions continued to be practiced.

One Cahokian practice that was adopted was ritual drink ceremonialism. Likely beginning during the Eveland Phase, residue (Washburn et al. 2014) and use-wear (Miller 2015) evidence on vessels from the Dickson Mounds Cemetery indicate that people in the CIRV began to use Ramey Incised/Powell Plain jars and other specialized vessels for the production of special drinks, such as Black Drink and cacao-based beverages, which were used during rituals and ceremonies (Emerson 2018). While these practices likely started during the Eveland Phase, it is unknown if they were practiced in later phases or after the use of Ramey vessels ended.

During the Orendorf and Larson Phases, people practiced a broad-spectrum exploitation of the environment with a greater focus on agriculture (Conrad 1991). Dietary practices continued to focus on agricultural products, including both Mesoamerican and Eastern Agricultural Complex crops, alongside the use of mammals and fish. The exploitation of a variety of wild plants, birds, and wetland resources supplemented these dietary staples (Conrad 1991; Tubbs 2013). Human skeletal isotopic data from the Orendorf site further suggests that maize was a major component of the diet (Tubbs 2013). While preliminary, data suggest that diet may have changed during these later phases as violence in the region increased, pushing people to focus more on hunting mammals and less on fishing and gathering wild plants (VanDerwarker and Wilson 2016). Unfortunately, very little is known about other food practices during these phases. Starting during the Orendorf Phase, a variety of serving or food presentation wares become more common, including the plate vessel form (Conrad 1991), which may suggest food practices were shifting during this time.

A larger amount of data exist regarding diet and food practices during the Bold Counselor Phase, but primarily from one site: Morton Village. At Morton Village, a variety of plant remains have been recovered, but maize appears to be the dominant resource. Alongside maize, the remains of domesticated beans and Eastern Agricultural Complex plants were also found, indicating that a complex agricultural system was likely one of the primary food sources for the residents of the site (Nordine 2020; Styles and King 1990). Wild taxa, such as nuts, fruits, and leafy greens, were also recovered but were less common than many of the agricultural products (Nordine 2020; Styles and King 1990). Similar to the Eveland Phase, a reduced use of nuts is apparent, but requires further research (King 1993; Schroeder 2000; Styles and King 1990). While maize appears to have been a staple at Morton Village, skeletal isotope data suggest that residents of the site ate less maize than those at Orendorf (Tubbs 2013). Limited analyses of faunal remains have identified a low diversity of animal use at the site overall, with large mammals and fish being the most common resources exploited (Styles and King 1990).

As discussed earlier in this chapter, evidence of a limited diet, coupled with evidence of violence at Norris Farms #36, has led researchers to argue that the diet of residents at Morton Village was restricted due regular warfare and raiding, forcing residents to stay close to home. As such, residents could only safely exploit close-by resources and agricultural fields, leading to a reduced diet and poor health (Milner et al. 1991; Santure et al. 1990). While more research is needed, recent botanical analyses from Morton Village have not found evidence that directly supports this interpretation (Nordine 2020).

Research by Tubbs (2013) utilized skeletal isotopic analyses to compare diet at Morton Village to other sites in the CIRV in order to examine expressions of identity at Morton Village. As mentioned previously, overall results indicate that residents of Morton Village interred at the Norris Farms #36 cemetery ate a slightly different diet compared to earlier Mississippian populations, as they relied less on maize. There was also a range of diets expressed within the Morton Village population itself, suggesting that diet and identity were complex and fluid at this time. While many ate different diets and may have attempted to signal non-Mississippian identities, situational consumption of different foods to signal a Mississippian or Morton Village identity may also help explain the variation of diets apparent at the site (Tubbs 2013). While a range of isotopic signatures were found during this analysis, recent research on botanical remains from the site indicate that migrant and local residents had access to and utilized similar plant resources, with some small differences possible (Nordine 2020). This data suggests that residents may have ate a similar diet, complicating understandings of food and identity at the site.

Aside from diet, ceramic information also suggests changes in food practices occurred. It is argued, based on the presence of plates and bowls with Oneota stylistic decorations, that Oneota migrants into the region adopted the manufacture and use of these vessel forms, which are rarely seen at other Oneota sites (Bengtson and O'Gorman 2016; Esarey and Conrad 1998; Santure et al. 1990). A use-wear pilot study on Oneota vessels from Morton Village found that these vessels might have served multiple functions, suggesting that adopted vessel forms may have been incorporated into traditional Oneota vessel use patterns while also helping migrants to take part in larger events within the community (Painter and O'Gorman 2019).

Current projects, including this dissertation, seek to build on this research and further explore the social roles of food at Morton Village and in the Bold Counselor Phase. Alongside other on-going research projects, this dissertation will expand our knowledge of cuisine and food practices in the Late Prehistoric CIRV, particularly regarding cooking and serving practices, which have largely been unexplored. Complimentary faunal and botanical studies that are in progress will help to create a wealth of information regarding food practices at Morton Village based on multiple lines of evidence. Building on research by Tubbs, O'Gorman, and others, this dissertation also will generate a greater understanding of the role of food in the social negotiations that occurred at Morton Village and in the Bold Counselor Phase. Together, this research will contribute to a greater understanding of the coalescence process and the refinement of coalescence models.

Archaeological Background of Comparative Sites

In order to contextualize patterns seen in cooking at Morton Village, patterns of cooking behaviors will also be explored at two comparative sites, the Tremaine Complex and Larson. Data from these sites will provide examples of the pre-migration cooking and foodways traditions of both migrant and local populations at Morton Village, allowing me to trace changes in foodways practices from pre-migration to post-migration contexts. A discussion of the excavation and culture history of these sites is found below.

The Tremaine Complex

The Tremaine Complex is a large Oneota occupation located within the La Crosse locality in west-central Wisconsin (O'Gorman 1993, 1994, and 1995). While composed of a number of different sites (OT [47Lc262], Filler [47Lc149], Tremaine [47Lc95], Firesign [47Lc359], You Kids [47Lc249], and unnamed site 47Lc248), the Tremaine Complex likely encompasses one area of Oneota occupation that was serially occupied, along with others in the locality, for a long period of time. Located on a sandy terrace within a wide stretch of the Mississippi River Valley, the Tremaine Complex was first documented in 1906. It was not heavily investigated until the 1980s, when roadway construction projects necessitated survey and excavation of various sites. The data used in this dissertation were originally collected during extensive excavations conducted by the Wisconsin Historical Society Museum Archaeology

Program from 1987 to 1991. Excavations were prompted by the proposed construction of US Highway 53 Expressway, which was to cut through a number of the Tremaine Complex sites. Ahead of this construction, major portions of the Tremaine, OT, and Filler sites were investigated, exposing over 1,100 features, nearly 100 burials, and at least 7 longhouses. A great majority of these are associated with the Oneota occupation of the area (O'Gorman 1995), providing an excellent data set to compare with Morton Village.

Based on numerous radiocarbon dates, Oneota occupations at the Tremaine Complex date between calibrated A.D. 1300 and 1650. Multiple dates indicate use of the site during each of the Brice Prairie (A.D. 1300-1400), Pammel Creek (A.D. 1400-1500) and Valley View (A.D. 1500-1650) Phases, suggesting that the Tremaine Complex, or at least parts of it, was occupied throughout that span (O'Gorman 1995:30). Based on resource depletion and other considerations, it is likely that the Tremaine Complex was not occupied constantly, but was likely sequentially occupied for a few decades, abandoned, and then re-occupied (O'Gorman 1995:238). Semi-permanent occupation of the area is further suggested by explorations of seasonality. Analysis of faunal remains from the Tremaine, OT, and Filler sites, while hampered by relatively poor preservation, all lack indications of cold season occupation, suggesting that the Oneota occupied the Tremaine Complex during the warm season and went elsewhere for the winter (Styles and White 1993, 1994, 1995). This pattern is further suggested by results at other Oneota sites in the La Crosse Locality (Arzigian et al. 1989; Sasso 1993; Theler 1989).

People living at the site relied on both agriculture and wild food resources to supply them with food, but may have increasingly relied on maize and other domesticated crops later in the site's occupation (Egan and Brown 1995; Styles and White 1995). Ceramics at the site are all shell tempered, globular jars of different sizes, decorated with distinctive Oneota designs

(O'Gorman 1993, 1994, 1995). Evidence of at least 7 longhouses were found, located within a concentrated area of the Tremaine site, while surrounding areas of the Tremaine, OT, and Filler sites contain scatters of pit features, occasional post molds, and at least one burial precinct. Burials at the site were primarily found within the Tremaine longhouses, but the mortuary use of the central knoll at the OT site was also documented. At least five concentrations of pit features were located, with many of them located nearby the longhouses (O'Gorman 1993, 1994, 1995). Based on radiocarbon dates and evidence of numerous re-building and expansion episodes, many of the longhouses present were used and re-used over long periods of time. Construction on most of the longhouses started during the Brice Prairie Phase, and their use continued through the Pammel Creek Phase and possibly into the Valley View Phase (O'Gorman 1995:85). While only 7 possible longhouses were documented, it is possible that others existed as well and either were not excavated or evidence of their existence was destroyed by landscape modification (O'Gorman 1995).

The Larson Site

The Larson site (11F3) is a Mississippian mound center located in the CIRV, a few miles southwest of Morton Village. Dated to the Larson Phase (A.D. 1250-1300), this town was occupied by local Mississippian people just prior to the arrival of Oneota migrants into the valley (Conrad 1991; Harn 1994). While its location has been known for some time, much archaeological research did not take place at the Larson site until the 1960's and 1970's. During that time, excavation, surface surveys, and aerial photography were used to investigate the site. The data used in this dissertation were collected during two stints of excavation. In 1966, an archaeological survey and excavation was undertaken during construction of a roadbed which ran east-west 300 meters through the central portion of the main occupation area. While features and structures were mapped, only limited excavation took place. Then, in 1970, a rectangular area around 0.5 hectares in size was excavated, documenting a large area along the southeast side of the main occupation area. During this later work, structures and features were mapped and fully excavated (Harn 1994, unpublished manuscript). In total, at least 95 Mississippian houses (including re-building episodes) and over 200 features were documented and excavated (Harn 1994, unpublished manuscript), providing a large data set from the period just before the Oneota appeared in the CIRV. Unfortunately, much of this information has not been published, so relatively little data on the Larson site is available.

Located along the western bluff-line of the valley at the intersection of the Spoon and Illinois River Valleys, Larson is a large town site, 8 hectares in size, centered around a large mound and plaza complex. Surrounding this mound and plaza complex on three sides is a roughly rectangular concentration of structures, features, and midden deposits, with the northeast side branching out and extending farther away from the plaza complex. Along the southern half of this concentrated village area was a palisade, but its presence has not been clearly documented on the northern side of the village. Scattered over a much larger area around the town complex are isolated structures, features, and at least one smaller cluster of structures, which may be dispersed homesteads associated with the Larson town (Harn 1994). As very few of these have been investigated, their relationship to the town site remains unclear. Ceramics at the site are characteristic of the Larson Phase, and include a number of different vessel types, such as jars, bowls, plates, and water bottles, with surfaces that are often cordmarked. Dickson series jars, both plain and trailed, are also relatively common (Conrad 1991; Harn 1994).

Occupation at Larson appears to have been intensive, but relatively brief (Conrad 1991; Harn 1994). Large portions of the site also appear to have been burned, but it is unclear why this occurred. While published data is lacking, Harn (1994) argues that the site was primarily occupied during the fall and winter, based on the presence of lots of charred nuts and corn, deer crania with shed antlers, the remains of migratory waterfowl, and the frequency of interior hearths in homes (35-36). He also states that, while primary occupation was during cold weather, it was also likely that at least part of the town was occupied, to a lesser extent, throughout the year. Further investigation is needed to verify these patterns and better understand settlement use during the Larsen Phase (Conrad 1991:142), but, based on this evidence, it is possible that Larsen was occupied during all seasons of the year. Harn (1994) has also argued that Larson was at the center of a larger settlement/subsistence system that was composed of the town itself, along with a number of smaller villages and hamlets in the area. In this system, people would have dispersed to the outlying sites in the warmer months to grow crops and exploit various resource areas, and then nucleated at the Larson site during the colder months. While possible, many of the outlying sites are not well investigated. For example, Morton Village, the focus of this dissertation, was once considered part of this Larson system, until recent archaeological work at the site has demonstrated that the main occupation at Morton Village was not purely Mississippian and post-dates the Larson site. Further research is needed to test the validity of the Larson system.

Summary

Overall, while more research is needed, current evidence indicates complex interactions and negotiations occurred after the migration of Oneota Tradition people into the CIRV. Morton

Village, the only Bold Counselor Phase site that has undergone extensive archaeological research, serves as a case study for understanding these interactions at the local community scale. Larson and the Tremaine Complex, Mississippian and Oneota villages respectively, act as comparative data sets that will establish an understanding of the past foodways traditions of the local and migrant populations living at Morton Village, information critical to understanding how foodways practices changed post-migration and the role they played within negotiations at the community level. This research will contribute to a broader corpus of data that will help to refine our understanding of the coalescence process and provide new directions for future research. The next chapter will describe my research questions for this project in more detail and outline the methods used to address these questions.

CHAPTER 4:

RESEARCH QUESTIONS, METHODS, AND MATERIALS

In this chapter, I outline the research questions, methods, and materials used to investigate the role of foodways in the process of coalescence. I begin by re-introducing the research questions laid out in Chapter 1 and then discuss the data needed to address these questions, the methods used to collect that data, and how the information was analyzed. To start outlining the specific methods used in this dissertation, I provide background information on use-alteration analyses of ceramics and then present the specific sampling strategies and methods used to address Research Questions 1 and 2. This discussion is followed by a summary of the methodology used to conduct spatial analyses of vessel function, which was performed to address Research Question 3. Results of the use-alteration analyses are presented in Chapters 5 and 6, while results of the spatial analyses are presented in Chapter 7. Information all three chapters are then interpreted within a framework of coalescence, foodways, and hybridization in Chapter 8 to generate a greater understanding of the social processes that occurred at Morton Village and the role of foodways within the coalescence process.

Research Questions

As discussed in Chapters 1 and 2, there is a need for further consideration of everyday practices within coalescence. One approach to this problem, which is used in this dissertation, is the exploration of foodways and its role in social relationships and identity (Twiss 2012). While there are many ways to investigate past foodways, I specifically focus on cooking and vessel function, as this avenue compliments analyses of diet by looking at other components of cuisine

(Kooiman 2018; Skibo 2013). A focus on cooking and vessel function also moves beyond an emphasis on what was eaten by considering how ingredients were turned into culturally-significant dishes and the ways in which these meals were consumed (Graff 2018; Rodriguez-Alegria and Graff 2012). By investigating changes to cooking and vessel function, archaeologists can explore in greater depth the hybridization of foodways and how food practices may have been used to create social bonds, manipulate changing power relationships, or maintain pre-migration identities, factors that would impact how coalescence progressed within a community and a region.

To investigate these factors at Morton Village, I address three primary research questions:

1) What cooking and serving practices were used at the community level at Morton Village, when all vessels are treated as one sample? Do comparisons of these practices to data from Larson and the Tremaine Complex uncover any differences in foodways from pre- to post-migration contexts?

2) At Morton Village, are there evident differences in cooking and serving practices between Oneota-style and Mississippian-style ceramics? Is the continuation of past foodways traditions visible when Mississippian-style vessels are compared to Larson and Oneota-style vessels are compared to the Tremaine Complex?

3) What is the spatial distribution of cooking and serving practices inside and outside of structures at Morton Village? When compared to Larson and the Tremaine Complex, are there any differences in the spatial organization of foodways from pre- to post-migration contexts?

By addressing these questions, I generate information regarding how food was cooked at Morton Village, the ways in which other vessels (such as bowls and plates) were used, whether there is any variation in how different styles of ceramics were used, and the spatial variation of different cooking techniques and vessel function categories. Through comparative analyses, I can then investigate how cooking and vessel use practices varied, or not, from pre-migration to coalescence contexts and detect if the hybridization of foodways was occurring at the site.

To gather the data necessary to answer the above research questions, I conducted two primary analyses. To address Research Questions 1 and 2, a use-alteration analysis of a sample of ceramics from Morton Village and the two comparative sites was completed. Data generated from this analysis was then subjected to a between sample comparison to detect any differences in vessel function. To investigate Research Question 3, I performed an analysis of the spatial distribution of different vessel types and functional categories at the three sites. These initial results were in turn compared to reveal any differences in the spatial distributions of vessel function at the three sites. Detailed justifications and methodologies for these analyses are outlined below.

During these analyses, descriptive statistics, visuals, and simple statistical measures are used to reveal patterns and compare data between the sites. As I am interested in exploring large-scale patterns in everyday behavior, more complex analytical techniques are not required, as the tools used here are adequate for understanding the data, evaluating the presence of similarities and differences between the datasets, and addressing the research questions asked in this dissertation.

Ceramic Use-Alteration Analysis

To uncover evidence of the hybridization of foodways practices, the primary goals of Research Questions 1 and 2, I completed a use-alteration analysis of ceramics from Morton Village, the Tremaine Complex, and Larson. While morphological and chemical analyses of ceramic vessels can help to determine how a pot was used during its life (Dunne et al. 2020;

Henrickson and McDonald 1983; Heron and Evershed 1993; Smith 1988), only use-alteration analyses can recover more detailed evidence of function, particularly regarding the kinds of cooking techniques people used in the past (Skibo 2013). As such, this method was utilized to detect changes in foodways and cooking practices that may have been part of social negotiations at Morton Village.

When ceramics are used for cooking or other tasks, traces of that use are left behind in the form of carbonization, sooting, charred residues, scratches, pitting, and other marks collectively called use-alteration traces. These marks are created in a regular and consistent manner through predictable processes, making it possible to infer the way a pot was used at a general level (Hally 1986; Skibo 2013). Different processes impact the exterior and interior of a vessel, making it important to examine both surfaces for use-alteration evidence.

When used for cooking, the outside of a vessel is often covered with soot (see Figure 4.1 for an example). Soot is the direct result of fuel combustion, created as particulates rise within released heat energy and adhere to the vessel. This effect provides direct evidence that a pot was used in a fire (Hally 1983; Skibo 2013). Both the temperature of the vessel and how it is placed in relation to the fire impact how soot is deposited. If placed directly in a fire, the base of the vessel reaches temperatures that can oxidize the outer surface, burning off any soot that had previously been deposited. In such cases, the vessel will appear clean on its base but be covered in soot around the area of maximum diameter (Figure 4.1). Pots that are suspended above a fire will not reach such high temperatures, allowing soot to be deposited on the base and mid-body. This same effect also occurs on boiling pots, as water permeating the vessel wall is capable of keeping it cooler, allowing soot to build, even directly in a fire. Other positions may create different patterns, following these same principles of sooting and oxidization (Hally 1983; Skibo

2013). Unfortunately, soot can also be deposited or removed from vessel exteriors when exposed to certain secondary environments, such as those present in a house fire (Skibo 2013), but the impacts of such cases on analyses can be minimized by examining large vessel sections and carefully considering provenience during sample selection. Details for such a process are outlined below.

Figure 4.1. Image of a Mississippian Cordmarked Jar from Morton Village (J-526) with zones of black soot on the exterior. This pattern of soot, which is mostly found at the widest extent of the vessel and not on the base, indicates the vessel was placed directly on top of a fire.

On the interior of a pot, a number of taphonomically different use-alteration traces can develop. Carbonization patterns are the most common. These patterns are created through the charring of food particles on and within the matrix of the interior wall of a vessel, which occurs once the wall reaches a temperature of 300°C or higher (Skibo 2013:96; see Figure 4.2). Beside temperature, water content is also a major determinant of where carbonization patterns form. During wet mode cooking (Skibo 2013:97), such as boiling or simmering, the water contained in a pot permeates the vessel wall and evaporates, keeping the wall below the temperature threshold needed to char food particles. As such, nothing below the water line will burn. Directly above the water, in an area known as the scum line, temperatures do become hot enough to char food particles, leaving a distinctive ring of carbonization near the top of the vessel. In dry mode cooking, where little to no liquid is involved, charring can take place all over the vessel, leaving interior walls that may be entirely covered with carbonization (Skibo 2013:97). These patterns develop slowly through accretional deposition, meaning that carbonization patterns are the result of a lifetime of use, not just the previous cooking event (Kobayashi 1994). Like sooting, carbonization patterns can also be impacted by certain secondary environments (Skibo 2013), but these impacts can be minimized by appropriate methodological considerations.

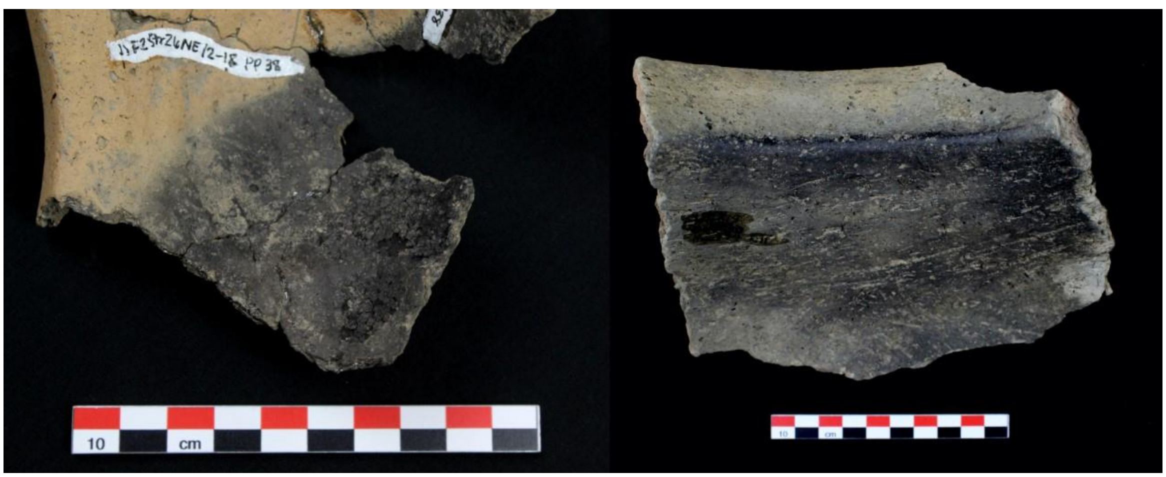

Figure 4.2. Images showing different types of carbonization. Adhered carbonization, in the form of fluffy and cracked charring, is present on the vessel to the left. Absorbed carbonization, which is only present in the vessel wall and cannot be easily scraped away, is present on the vessel to the right.

Evidence of attrition, or physical damage caused by use, also provides clues as to how a vessel was used. This damage can be caused by abrasive and non-abrasive activities on both the exterior and interior surfaces of a vessel. Abrasive processes are actions where something impacts and damages the vessel wall, removing some amount of ceramic material from it. While the level and type of damage is impacted by a number of factors, actions such as stirring the contents of a pot, moving or turning it on the hearth, or even washing it, can cause scratching and other damage (Forte et al. 2018; Skibo 2013). Non-abrasive impacts are more informative. Non-abrasive damage, such as pitting or spalling, is caused by chemical and other natural processes, often based on how a vessel is used. For example, the chemical processes of fermentation cause gases to build up inside the vessel wall matrix, which will expand and cause the wall to spall once the gases reach critical mass (Arthur 2003; Forte et al. 2018; Skibo 2013). Attrition, in combination with carbonization and sooting patterns, provides a solid base from which to infer how pots were used.

Sampling Strategies

Using this information, I conducted use-alteration analyses of samples of pottery from Morton Village, Larson, and the Tremaine Complex, using the vessel as the minimal level of analysis. While whole vessels are ideal for this analysis (Skibo 2013), their recovery is rare in domestic contexts. As such, vessel segments that include portions of both the rim and body of a vessel were examined, as well as any large body sections for which a morphological vessel type (e.g. jar, bowl, plate, etc.) could be determined. Large body sections are included in this analysis as reuse of such sections for griddles and other cooking implements has been documented at other sites (Hally 1983; Wilson and Rodning 2002). Alongside size restrictions, vessels from contexts directly impacted by non-cooking fire exposure, such as catastrophic house fires, were not used for this analysis, as previous studies (Skibo 2013) and the results of initial experimental research by the author demonstrate that exposure to high heat can alter sooting and carbonization patterns. Unfortunately, documentation of specific contexts at some of the study sites, such as structures at Larson, is currently lacking, making it impossible to determine if some vessels were altered after use. As such, some vessels included in this analysis may have been impacted by exposure to high heat or burning debris.

Site-specific sampling strategies were also used due to the particular history of each community and the research questions being addressed. For Research Question 1, which examines cooking practices at Morton Village as a whole by treating the entire community as a single pooled sample, all vessels from Morton Village that were large enough were analyzed. To address Research Question 2, which investigates differences in vessel function between Oneota- and Mississippian-style pottery at Morton Village, the sample used to address Research Question 1 was sub-divided into Oneota-style and Mississippian-style vessel sub-samples based on traditional typological definitions. Vessels with no decoration, no surface treatment, or that possessed stylistic characteristics of both types were not included in these sub-samples, as they could not be categorized as Mississippian- or Oneota-style vessels. Slightly different stylistic markers were used to categorize vessels based on what vessel type was represented (Figure 4.3). Oneota-style jars are defined by the presence of characteristic Oneota motifs composed of trailed lines and punctations on the shoulder of the vessel, as well as occasional lip tool impressions on the rim, which were formed in a wet paste, while Mississippian-style jars have cord-marked exteriors that end at the shoulder or extend all the way to the neck of the vessel. Oneota-style bowls are primarily represented by vessels with lip tool impressions on the rim of the bowl and occasionally characteristic trailing designs on tab-like extensions of the vessel rim, while Mississippian-style bowls possessed cordmarked exteriors. One Mississippian-style bowl also possessed a traditional sun-motif incised in a dry paste near the rim of the vessel. Oneota plates are characterized by traditional Oneota motifs composed of trailed lines in a wet paste on the interior rim of the vessel, while Mississippian plates possess designs on the interior rim composed of incised lines performed in a dry paste. Mississippian incised designs on plates commonly take the shape of different sun-related motifs, while Oneota designs are more abstract and are similar to those seen on Oneota jars (Conrad 1991; Esarey and Conrad 1998; Santure et al. 1990).

Figure 4.3. Images demonstrating the different ceramic styles present at Morton Village. Images A (thin-lined incising) and B (cordmarking) are typical of Mississippian ceramics, while images C (wide trailed lines and punctations) and D (tool-impressed rims) are typical of Oneota ceramics.

The Morton Village assemblage was divided in this way as a means to uncover any differences in cooking and vessel use that may relate to the migrant and local populations at the site (the goal of Research Question 2), as this information will indicate if past foodways traditions were being maintained or if hybridization was occurring. To operationalize such an investigation, I assume that the majority of Oneota-style pots would have been used by migrant Oneota cooks, while the majority of Mississippian pots were used by local Mississippian cooks. I acknowledge that such an approach to pottery style and ethnicity is problematic, as pottery style is not always emblematic of ethnicity or other larger social formations and may not correlate with cultures or groups as defined through archaeological methods (Croucher and Wynne-Jones 2006; Gosselain 2000). Even within contexts of household pottery production, such as at the sites considered here, pots also can move, meaning that not all pots were used by individuals who originally made them (Fie 2008; Longacre 1991; Ruby and Shriner 2005; Silva 2008; Wandibba 2010). Despite these issues, pottery style is a major dimension of variability at Morton Village that should be examined further. Style also appears to have been important to residents of Morton Village, as few vessels possess mixed or new stylistic practices and traditional Oneota designs were transferred onto new vessel types, further demonstrating the need to explore this characteristic to determine if it holds any significance.

At the Tremaine Complex, at least 564 vessels were recovered during excavations, but from an occupation that intermittently spanned at least three centuries (O'Gorman 1993, 1994, 1995). During this lengthy period of occupation, vessel function was not consistent, shifting to more specialized uses of vessels in the last phase at the site (Painter 2020). To reduce biases associated with shifts in function over time and to ensure that the sample from the Tremaine Complex is roughly contemporaneous with Morton Village, I only examined ceramics from the first two phases of occupation in the La Crosse Locality: Brice Prairie (A.D. 1300-1400) and Pammel Creek (A.D. 1400-1500). Chronological placement was determined on a feature-by-feature basis using previous radiocarbon dates and seriation analyses (Boszhardt 1994, 1998; O'Gorman 1993, 1994, 1995), and is based on the method used by O'Gorman (1995) to divide features at the Tremaine site into chronological periods.

In her analysis, O'Gorman (1995:136) used stylistic data from vessels within each feature and known seriation markers for the La Crosse Locality to relatively date features at Tremaine. Based on specific stylistic traits, vessels and features were placed into one of the five following chronological periods: Brice Prairie, Brice Prairie or Pammel Creek, Pammel Creek, Pammel Creek or Valley View, and Valley View. Features were placed into the Brice Prairie Phase based on ceramics with inner lip decoration and undecorated loop handles attached at the lip. If vessels had shoulder motifs similar to Perrot Punctate and had both inner lip and bold lip (notches equal to or greater than 1.25cm wide) decoration, then those features were placed within the Brice Prairie or Pammel Creek Phase. Features dominated by vessels with bold lip top impressions and shoulder motifs similar to Midway Incised and Allamakee Trailed were placed into the Pammel Creek Phase. Features with ceramics characterized by non-bold, but not particularly fine, lip top impressions are designated as Pammel Creek or Valley View Phases. Finally, those features with vessels that possess fine (between 3 to 8mm) rim top notching and decorated, wide strap handles attached below the lip were placed in the Valley View Phase.

In an effort to maintain consistency with previous work at the site, O'Gorman's (1995) original feature designations at Tremaine were used, while I applied this same methodology to relatively date features at the OT and Filler sites. At all sites, available calibrated radiocarbon dates were also examined, and were given precedence over relative dating techniques for dating those features with associated radiocarbon dates. Once features were dated, all large vessel sections were then analyzed from those features that fell into the Brice Prairie, Brice Prairie or Pammel Creek, and Pammel Creek Phase categories. Due to the generally late dates for all features at Filler, no vessels from that site were included in this analysis.

Since Larsen was a relatively short-lived occupation, it was unnecessary to divide the ceramic assemblage from this site. As a result, all large vessel sections from the site were analyzed.

In total, nearly 350 vessels were analyzed for this study. This includes all large vessel sections from these sites that met the sampling standards outlined above. At Larson, 81 vessels were analyzed, including 36 jars, 18 bowls, and 27 plates. At the Tremaine Complex, where jars are the only vessel type present, 53 jars were analyzed. At Morton Village, a total of 215 vessels were examined (94 jars, 76 bowls, and 45 plates), divided between indeterminate-style, Oneota-style, and Mississippian-style sub-samples. In total, 49 vessels (7 jars, 39 bowls, and three plate) were indeterminate as to style. 59 vessels were Mississippian-style, including 19 jars, nine bowls, and 31 plates, while the Oneota-style sub-sample consisted of 68 jars, 28 bowls, and 11 plates. Within the Morton Village sample, there is a bias towards Oneota-style vessels, which are represented by twice as many vessels as Mississippian-style. While there is no shortage of Mississippian-style vessels at Morton Village, they are frequently represented by body sherds or small rim fragments, suggesting that the two samples may have been impacted by different cultural processes before or during deposition. Unfortunately, their small size makes most Mississippian-style vessels unsuitable for this study, limiting my ability to balance the ratio between these two samples.

Data Collection

To collect the data necessary to address Research Questions 1 and 2, I identified vessels that met the criteria above and then visually examined each one for any evidence of carbonization, sooting, and attrition. Presence and absence of exterior and interior use-wear evidence was noted and sketched on data recording sheets generated by the author, as sketching is a simple and effective means of documenting evidence of use on vessel surfaces. Three different data recording sheets were used depending on the vessel type being documented (jar, bowl, and plate), as each sheet contained a generic outline of that particular vessel shape.

Information regarding provenience, vessel number, part represented (such as complete vessel profile versus rim and shoulder only), surface treatment, decoration, and morphological metrics were also collected. Measurements were collected to detect any major morphological differences in vessel shape between the ceramic samples and which may suggest a difference in intended function (Skibo 2013; Smith 1988). Some measurements, such as rim diameter and rim angle, are also used during use-wear analyses to investigate functional differences within a certain class of vessels in an individual sample. For example, rim diameter can be used as an estimate of vessel size, allowing researchers to compare function between different sized jars or plates. Metrics collected for this study include rim diameter (cm), shoulder diameter (cm), vessel height (cm), rim height (mm), rim length (mm), rim thickness (mm), lip thickness (mm), shoulder thickness (mm), side thickness (mm), base thickness (mm), rim angle (degrees), and shoulder angle (degrees). At Morton Village, measurements were collected by both myself and Jodie O'Gorman. At the Tremaine Complex, previous measurements collected by Jodie O'Gorman (1993, 1994, 1995) were used for consistency, while I measured these dimensions on all Larson vessels. Once collected, all data was entered into Excel™ files, one for each site, for organization and simple statistical analysis.

After initial data collection was completed, I translated the sketches of use-wear patterns into categorical data using a coding system that was applied to all vessels (See Table 4.1 for example of the coding scheme used for jars). Unlike the sketches, categorical data can be compared statistically, enabling me to compare vessel function data between the assemblages under investigation and to address Research Questions 1 and 2 in a more rigorous manner. While sooting, carbonization, and attrition were all examined, this coding scheme considers only sooting and carbonization patterns, as pilot studies on these assemblages have demonstrated that attrition evidence is uncommon (Painter and O'Gorman 2019; Painter 2020). As such, sooting and carbonization patterns are more reliable measures of vessel function in this case. Due to variability in use-wear patterns and functions between vessel classes, slightly different systems were also used for different vessel types (jars, bowls, and plates).

Table 4.1. Example of Coding Scheme Used for Jars		
Part of Vessel	**Code**	**Summary**
Exterior	1	No sooting
	2a	Sooting on top half- bands on rim and shoulder
	2b	Sooting on top half- patchy throughout
	2c	Sooting on top half- continuous
	2d	Sooting on top half- amorphous
	3a	Sooting on top half, unknown bottom edge- bands on rim and shoulder
	3b	Sooting on top half, unknown bottom edge- patchy throughout
	3c	Sooting on top half, unknown bottom edge- continuous
	3d	Sooting on top half, unknown bottom edge- amorphous
	4a	Sooting on bottom half- patchy
	4b	Sooting on bottom half- continuous
	4c	Sooting on bottom half- amorphous
	5a	Sooting all over- patchy
	5b	Sooting all over- continuous
	6	Amorphous sooting
Interior	1	No carbonization
	2a	Carbonization on rim only- patchy
	2b	Carbonization on rim only- clear band
	3a	Carbonization on bottom only- patchy
	3b	Carbonization on bottom only- continuous
	4a	Carbonization on rim and base, break in-between- patchy
	4b	Carbonization on rim and base, break in-between- zones continuous
	5	Heavy carbonization on rim/neck, zone of light carbonization below
	6	Lighter zone of carbonization on rim/neck, heavy carbonization below
	7a	Patchy carbonization throughout body
	7b	Interior continuously covered with carbonization
	8	Possible decoction- thick band of carbonization in mid-body
	9	Amorphous carbonization

During data collection, use-wear patterns on a vessel were classified based on the location of sooting and carbonization (just on the top half, just on the bottom half, etc.) and its intensity (patchy, a defined band, a continuous distribution, etc.), using a consistent system. For example, a jar with patchy carbonization only on the interior rim would receive an interior designation of 2a, while a vessel with an interior carbonization pattern of 3b contained a base completely covered in carbonization. This determination was done for the interior and exterior of a vessel individually. These scores were then used to place the vessel into one of a number of pre-defined functional classes that were based on previous use-alteration research (Hally 1986; Kooiman 2016, 2018; Miller 2015; Skibo 2013) and previous pilot studies conducted on these assemblages (Painter and O'Gorman 2019; Painter 2020). Among jars, these classes are storage/serving, wet mode, dry mode, multi-purpose, stewing/multi-purpose, possible decoction, possible griddle, and unknown (Figure 4.4). A narrower range of functional categories was applied to bowls and plates, including storage/serving, wet mode, dry mode, multi-purpose, and unknown. The carbonization patterns associated with each functional category are outlined in Table 4.2 below.

Table 4.2. Description of Functional Categories

Functional Category	**Code**	**Associated Carbonization Patterns**
Storage/Serving	1	No soot on exterior or carbonization on interior
Wet Mode	2	Soot on exterior; carbonization on interior rim and upper shoulder only
Dry Mode	3	Soot on exterior; carbonization on interior lower body and base only
Multi-Purpose	4	Soot on exterior; areas of carbonization near rim and on lower body with clean zone in between
Stewing/Multi-Purpose	5	Soot on exterior; carbonization all throughout interior
Possible Decoction	6	Soot on exterior; wide zone of carbonization found in middle of vessel interior but with a base that is clean
Possible Griddle	7	Only half of vessel profile present; exterior may have soot or may be oxidized; circular patch of carbonization present mid-body
Unknown	8	Soot on exterior but no interior carbonization; anomalous interior carbonization pattern that does not fit above categories

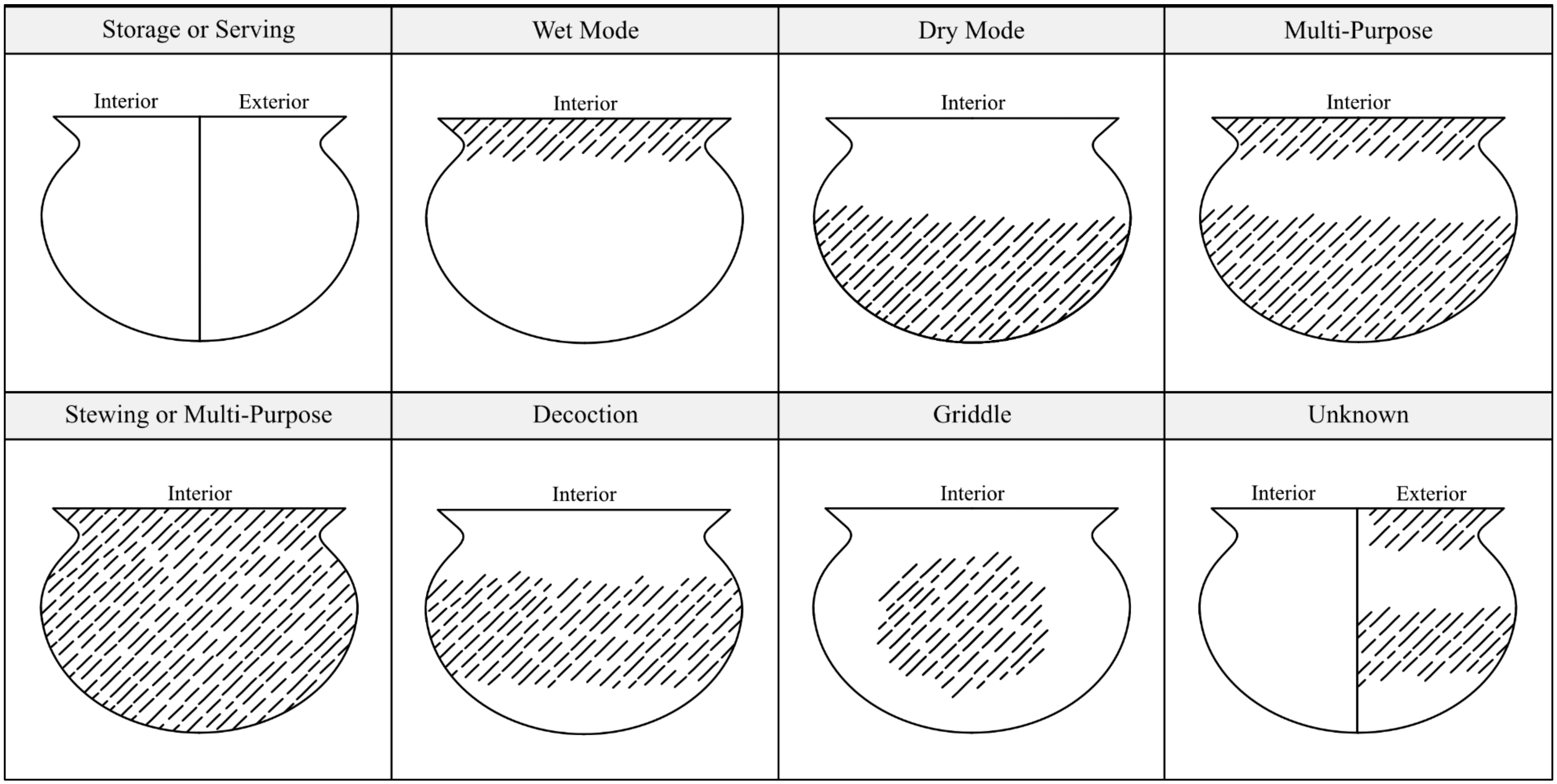

Figure 4.4. Stylized examples of the different carbonization patterns associated with the jar functional categories used in this dissertation.

Morphological Comparisons

Following data collection, initial analyses exploring variations in vessel morphology were completed. As vessel shape often correlates in general ways with vessel function (Henrickson and McDonald 1983; Skibo 2013; Smith 1988), morphological comparisons were undertaken to generate baseline understandings of variability between and within the different assemblages and to identify any major morphological differences that may indicate disparities in intended function. The results of these comparisons were used to inform analyses conducted to investigate Research Questions 1 and 2.

To investigate morphological variation within and between the samples, analyses were conducted using the metric data collected on each vessel included in the use-alteration analysis. Four samples were examined for this investigation; Oneota-style ceramics from Morton Village, Mississippian-style ceramics from Morton Village, ceramics from Larson, and ceramics for the Tremaine Complex. To begin, metric data was examined within samples only, by individual vessel classes (jars, plates, and bowls), to detect any sub-groupings within these vessel classes that might pertain to vessel function. Descriptive statistics were used, including mean, median, standard deviation, mid-spread, box-and-whisker plots, and histograms, as these methods help to summarize a set of data and demonstrate any tendencies that may be present (Drennan 2009; Sinopoli 1991). Descriptive statistics were calculated and examined using Excel™ and R (R Core Team 2020).

Comparisons were then made between the four assemblages, with each assemblage broken down further by vessel class (jars, bowls, and plates). To conduct the comparisons, two assemblages were examined at a time so as to detect differences in specific attributes between the two assemblages. Initial comparisons were made using the same descriptive statistical methods indicated above. Statistical comparisons of means were then made between two assemblages at a time, using Welch's Two-Sample T-Tests, as a way to more rigorously test for significant differences. A Two-Sample T-Test is a parametric test that is able to compare the means of a numeric variable among two groups of data and is generally insensitive to small sample sizes and minor deviations from a normal distribution as long as the two groups of data have relatively similar distributions (Drennan 2009). Welch's version of the T-Test was utilized in this case to account for unequal variances and unequal sample sizes between the different groups being compared (Delacre et al. 2017; Ruxton 2006). For all T-Test calculations, a null hypothesis was evaluated that stated that the means of the two groups being compared were equal. This hypothesis was rejected if the resulting probability value was 0.05 or lower, indicating that variations between the means of the two groups were significantly different and not a result of the vagaries of sampling. This process was done for each individual vessel type within two larger ceramic assemblages. For example, Mississippian-style jars from Morton Village and Larson were compared using the above methods to detect any meaningful differences in morphology, then bowls were compared, and finally plates. All T-Test comparisons were performed in R (R Core Team 2020).

Use-Alteration Analysis- Research Question 1

After investigating the presence of morphological differences, I began analyzing the use-alteration data to address the first two research questions outlined above. To address Research Question 1, which focuses on exploring cooking and vessel function at the community level, I examined ceramic use-alteration data from all three sites. From this analysis, an understanding of vessel use throughout these communities was generated, along with a baseline from which further investigations, specifically Research Question 2, could proceed. For this research question, all vessels that were large enough from each site were analyzed.

After use-wear patterns were transcribed as categorical data, ratios of overall functional categories at each site were transformed into percentages and then plotted as a pie chart. This process was done separately for each vessel class so that both what types of cooking techniques were used by vessel type and their relative prevalence of use at each site could be explored. The same analysis was completed for exterior sooting patterns as a means of examining the relative prevalence of suspending cooking pots versus putting them directly into a cooking fire.

While most functional categories used in this analysis are mutually exclusive, the multi-purpose functional category includes evidence of both wet and dry mode cooking, and therefore was treated differently. After initial exploratory analyses, the number of multi-purpose vessels was added to both wet and dry mode functional categories so that a more accurate ratio of the use of these two cooking techniques was established. This division was only conducted for those vessels that displayed clear use for multiple purposes, but not for the stewing/multi-purpose vessels, as carbonization patterns in the latter pots make it impossible to differentiate exactly what cooking techniques were used.

Subsequent analyses were then completed to explore the relationships between vessel function and specific morphological characteristics of vessel types within each sample. First, the relationship between vessel size and function was examined. Using information generated by the morphological analyses, different size classes were created for each vessel type by using estimated rim diameter measurements, which serves as a proxy for vessel size (Hally 1986:272). To create different size classes within a vessel type, rim diameter measurements from an individual sample were used to create a histogram. Based on peaks in the frequency distributions, different size classes of vessels were established (Sinopoli 1991). The functions of vessels within each size class were then examined to determine if certain vessel size classes, such as medium-sized jars, were used regularly for just one function or a range of functions.

To further test the relationship between vessel size and function, a Welch's One-Way Analysis of Variance (ANOVA) test was performed, as it allows me to statistically test whether differences in function among the size groups are a matter of chance or signify meaningful population differences (Drennan 2009; Noether 1991). ANOVA tests are parametric calculations that are able to compare the means of three or more groups of independent observations and are not greatly limited by smaller sample sizes. Unfortunately, regular analyses of variance assume that observations in each group will be normally distributed and that the variances will be equal (Drennan 2009). Since the data considered here often violate these observations, Welch's ANOVA was used instead. Welch's version of ANOVA, like the Welch's T-Test used above, does not assume equal variances and is more forgiving when observations deviate from a normal distribution (Delacre 2019). All Welch's ANOVA calculations tested the null hypothesis that all of the samples considered were drawn from populations with the same mean values. This hypothesis was rejected if the resulting probability value was 0.05 or lower, indicating that at least one of the means being compared possessed significant differences from the others and was likely from a different population. The test was calculated once for each vessel type in each sample using R (R Core Team 2020).

The relationship between plate rim angles and vessel function was also examined. Previous analyses (Lieto and O'Gorman 2014) have found that plates at Morton Village varied widely in their shape, based largely on differences in rim angle, ranging from plates that are flatter and more open to those that have steeply-angled rims and are more bowl-like. To explore this variability, frequency distributions of rim angles were plotted as histograms to determine if two or more types of plates were created and used. Plate rim angle and vessel function were then compared to see if any patterns in vessel function existed. As with estimated rim diameters, a Welch's ANOVA test was also conducted, using the same null hypothesis and rejection threshold, to statistically test for any significant differences between plate function and rim angle. Again, calculations were completed using R (R Core Team 2020).

After these analyses had been completed for each individual assemblage, comparisons of vessel function between sites could then be performed. These comparisons were executed to explore any differences in cooking and vessel function between the sites, which may indicate that residents were or were not trying to maintain past foodways traditions. As much of this research uses categorical data, descriptive and non-parametric statistical tests were used to determine if significantly different choices in cooking and vessel function are represented in the analyzed samples. Unfortunately, the nature of the data and small sample sizes restricted the statistical approaches that could be used for this research.

To explore variations in overall cooking techniques used (irrespective of vessel size), as well as their relative prevalence, percentages of functional classes were plotted into bar charts, one for each vessel class. This was done to visually compare the relative frequencies of how different vessel types were used at the three sites. After visual comparisons were made, statistical methods were used to test whether the observed differences in function were statistically significant. For this study, the Fisher's Exact Probability Test (Siegel 1956) was used, as it is a non-parametric technique that allows me to compare the actual frequencies of a categorical variable among two independent groups to see if there are significant differences between them. Often, the Chi Square test (Noether 1991) is used in these situations, but in this case sample size concerns make using the Fisher's Exact test more appropriate. In general, when sample sizes are small, the Fisher's Exact test is more effective than the Chi Square test, as it utilizes exact numbers instead of expected values. In addition, the expected values for the use-alteration data used in this dissertation regularly do not meet the sample restrictions for the Chi Square test, which requires that each cell in a contingency table have an expected frequency of at least one and that over 80% of the cells have expected frequencies greater than five (Drennan 2009:192). These violations lower the accuracy of the Chi Square test and make it inappropriate for this study. The Fisher's Exact test, on the other hand, can be applied to contingency tables that are 2x2 or larger and that have cells with values less than five (Andres and Tejedor 1995; Hess and Hess 2017; Nelson 2020), making it applicable for the data being analyzed.

Using the Fisher's Exact test, functional data from one vessel type were compared between two assemblages at time, such as jars from Morton Village and jars from the Tremaine Complex, so that differences in function, if any, were detectable at a finer resolution. All Fisher's Exact tests in this dissertation were performed in R (R Core Team 2020) and test the null hypothesis that the two vessel assemblages being compared possess similar proportions among vessel function categories. This hypothesis is rejected if the resulting probability value is 0.05 or lower, indicating that differences in vessel function proportions are not due to sampling errors but to significant variations in practices between the assemblages. To reduce the number of cells with a value of zero and improve the accuracy of the tests, vessel function data was manipulated. Among jars, the "possible griddle" and "possible decoction" functional categories were excluded in all comparisons, as only three of the 176 analyzed jars were placed in those categories. Data for bowls and plates were collapsed further. Since a number of functional categories were not applicable to bowls and plates within the different assemblages, creating cells with a value of zero, data on bowl and plate function were collapsed into two categories, “serving/storage” and “cooking.” While this minimizes differences between data sets, it still allowed me to statistically test broad differences in how these vessel types were used. More detailed analyses of function were then made using descriptive statistical methods.

Together, the results of these comparisons demonstrate the similarity and differences present in vessel function between Morton Village, the Tremaine Complex, and Larson. This information suggests how cooking and foodways traditions changed in post-migration contexts at Morton Village, and how those changes may relate to the on-going process of coalescence at the site.

Use-Alteration Analysis- Research Question 2

To explore the use-alteration data from Morton Village further, Research Question 2 seeks to explore variability in the use of traditional Oneota-style and Mississippian-style pottery at the site. As pottery style is a major dimension of variability at the site and may be the expression of two different social groups, this analysis provides more information regarding intra-site differences in cooking and foodways traditions at Morton Village and the choices of different parties living at the site. For this analysis, the Morton Village sample used in Research Question 1 was split into Oneota-style and Mississippian-style sub-samples. Since the same data was used for the Tremaine Complex and Larson samples in both Question 1 and 2, the results from Research Question 1 were used to represent those samples in this section of the analysis, while the results from the two Morton Village sub-samples were calculated using the following methods. Methods similar to those outlined above were then used to compare the four samples.

Initially, raw functional data for each vessel type within the two Morton Village sub-samples were standardized, transformed into percentages, and then plotted into a pie chart. The same step was completed for the exterior soot data. These exploratory steps were completed to understand what types of cooking techniques were used and in what types of vessels, as well as to get an idea of how vessels were placed around the hearth. As outlined for Research Question 1, the number of multi-purpose vessels (excluding those in the stewing/multipurpose category) subsequently were added to the wet and dry mode categories to understand the true prevalence of those two cooking techniques within the samples.

After data for each sample was compiled, analyses of the relationships between vessel function and vessel size and plate function and plate rim angle were completed using the same methods detailed above. Results were calculated for the Morton Village sub-samples, while the results from Research Question 1 were used for the Larson and the Tremaine Complex.

The results of these analyses were then compared between the samples. Specifically, use-alteration data was compared in three ways: 1) between the Morton Village Oneota-style vessels and Morton Village Mississippian-style vessels, 2) the Morton Village Oneota-style vessels and the Tremaine Complex vessels, and 3) the Morton Village Mississippian-style vessels and the Larson vessels. These comparisons were performed to identify differences in how vessels belonging to the two stylistic traditions at Morton Village were used, as well as to detect variations in how Mississippian-style vessels were used at Larson and Morton Village and how Oneota-style vessels were used at the Tremaine Complex and Morton Village. These comparisons are important because they reveal how the use of certain vessel types, and consequently foodways traditions, varied from pre-migration contexts to post-migration contexts, which may signify whether past food traditions were being maintained or if the hybridization of foodways was occurring.

First, percentages of functional classes were plotted into bar charts, one for each vessel class, to visually compare the relative frequency of different functions between the samples. Once visual comparisons were made, statistical methods were used to determine if statistically significant differences in vessel function existed between the three groups outlined above. As in Research Question 1, the Fisher's Exact test (Hess and Hess 2017; Nelson 2020) was used to compare vessel function between the different assemblages. This test was used to reject or support the null hypothesis that the two vessel assemblages being compared possess similar proportions among vessel function categories, with a probability rejection threshold of 0.05 or lower.

During the Fisher's Exact comparisons, jar data was manipulated to reduce the number of cells with a value of zero. This reduction was completed by excluding the "possible griddle" and "possible decoction" functional categories. Plate and bowl functional data was also manipulated for this purpose, condensing the data into "serving/storage" and "cooking" categories. Again, functional data from only one vessel type were compared between two assemblages at time to aid in determining where differences existed.

In tandem with the results from Research Question 1, analyses completed to address Research Question 2 identify more detailed information regarding vessel function at Morton Village. They specifically demonstrate similarities and differences in cooking and foodways traditions present at Morton Village, as well as suggest changes that occurred to these traditions during their transition from pre-migration to post-migration contexts. Combined, this information provides compelling evidence for how foodways practices may have been used within social negotiations that were part of the coalescence process at Morton Village.

Spatial Analysis

To contextualize the results of use-alteration analyses, Research Question 3 focuses on investigating the spatial distribution of different vessel types and vessel functions at the three sites. Examined alongside use-alteration data, spatial data can provide further information regarding the use of different vessels or cooking techniques. Spatial patterns can suggest whether the use of specific vessels or cooking techniques were widespread throughout a community, reserved for use in specific contexts, or preferred by certain segments of the community compared with others (Blitz 1993). It can also generate more information about specific occurrences of coalescence by contextualizing changes in foodways practices, providing more information regarding where certain behaviors may have been taking place within the community.

While spatial data is important for archaeological interpretation, one must consider the effects of cultural and natural formation processes on those patterns. In archaeological sites, it is rare to find objects that were left in-situ at the spot they were originally used since they continue to be subjected to cultural and natural post-depositional taphonomic processes. Instead, objects are used, broken, transported one or more times, and then deposited in a more permanent location (Beck 2006; Deal 1985; Schiffer 1987). Broken objects can also be re-used for different purposes, such as building materials, temporary storage, kiln/firing supports, or others (Deal 1985; Hayden and Cannon 1983). Once abandoned, objects can be moved further by other natural and cultural processes, such as through the action of burrowing animals or subsequent digging for storage pits or house basins (Schiffer 1987). Through these processes, objects move in space and may distort spatial patterning.

Fortunately, ethnoarchaeological studies of sedentary communities in many parts of the world have elucidated how people in the past may have disposed of trash, and have demonstrated that people typically do not move trash great distances from where it was used (Arnold 1990; Chang 1991; Deal 1985; Hayden and Cannon 1983; Kamp 1991; Siegel and Roe 1986). In general, ethnoarchaeological studies have found that the disposal of unwanted items is guided by the principle of "economy of effort" (Beck 2006; Deal 1985; Hayden and Cannon 1983:154), as people in sedentary communities typically only move trash a short distance away from activity areas, possibly only a few meters away. As such, pit features, middens, and abandoned house basins adjacent to structures at Morton Village and in the comparative sites are likely trash disposal areas for those who lived nearby. The relatively intact nature of many of the vessels in the samples examined here also suggests that these vessels were not re-used heavily or greatly impacted by subsequent abandonment and formation processes, as such impacts likely would have led to further destruction and dispersal of vessel fragments. Considering these factors, it is likely that any general spatial patterning in vessels and vessel function is meaningful behaviorally and not a result of subsequent disposal and post-depositional processes.

Along with formation processes, the impacts of sampling decisions on spatial patterning must also be considered (Asch 1975; Delmelle 2009; Drennan 2009). In order to conduct an effective use-alteration analysis of ceramics, complete or large sections of vessels are imperative, leading to a non-random sampling strategy as only those vessels are selected for analysis. This non-random strategy may favor the selection of pots from contexts that have been treated differently or were less impacted by various processes, creating a sample that is not necessarily representative of the assemblage as a whole, especially in terms of spatial patterning. As only certain vessels can be analyzed, use-alteration analyses often rely on small sample sizes as well, which can make it difficult to see any clear distributions or to extrapolate about the larger population of vessels at a site. Aside from sampling decisions for this study, different excavation strategies between the sites may also impact or bias spatial patterning. At the Tremaine Complex and Larson site, massive block excavations were excavated ahead of construction projects, leading to the complete excavation of all features and structures in large portions of a site. At Morton Village, excavations have been more targeted and have involved the excavation of numerous small blocks of the site to sample multiple areas and address particular research goals. While excavations have been scattered across much of the known extent of the site, there has not been any extensive excavation of all structures and features in one area. As such, any comparisons of spatial patterning between the sites must account for these different excavation strategies.

Ethnographic Investigations Regarding Cooking Spaces

To address Research Question 3, expectations about where cooking may have taken place in the past were created. These expectations were used to generate an analytical model critical for exploring the spatial distributions of vessels and cooking techniques. To create these expectations, I examined a selection of ethnographic resources focused on indigenous groups in different parts of the Eastern Woodlands and Prairie Peninsula so that a broad coverage of the region would be achieved. These resources included ethnographies discussing the Mascouten or Prairie Potawatomi (Skinner 1924-1927), the Hasinai (Bolton 1987), the Ho-Chunk (Lurie 1961; Radin 1923), the Powhatans (Rountree 1989), the Sauk (Skinner 1923-1925), the Chippewa

(Densmore 1979), the Ioway (Skinner 1926), the Yuchi (Speck 1909), the Omaha (Fletcher and La Flesche 1911), the Menominee (Skinner 1921), the Huron (Trigger 1969), and work by Swanton (1946) summarizing information regarding a number of southeastern Native American groups. For this investigation, I only focused on cooking performed at hearths, not in earth ovens, as pottery is used more frequently while cooking over an open flame.

In general, little information is included regarding where cooking took place. Based on mentions in a number of different ethnographies, domestic cooking locations appear to have differed seasonally. During colder times of year, cooking was done indoors at a hearth constructed within each home, often at the center of the structure (Bolton 1987; Densmore 1979; Fletcher and La Flesche 1911; Swanton 1946; Trigger 1969). During warmer months, cooking could be done inside, but was more frequently conducted outside to prevent the home from getting too hot (Densmore 1979; Skinner 1921, 1923-1925; Speck 1909; Swanton 1946). It is generally not noted how far away from the home this took place, but documents do indicate that groups like the Sauk, Caddo, Yuchi, and Menominee occasionally built arbors or sun-shades that were attached to the side or front of their homes for working and lounging during warmer weather (Skinner 1921, 1923-1925; Speck 1909; Swanton 1946). Ethnographic accounts also indicate that the Ho-Chunk built sun-shades as well, but it is not clear if these were attached to homes or were free-standing structures (Lurie 1961). In such instances, cooking is mentioned as one of the activities that would take place under these sun-shades (Speck 1909), suggesting that cooking done over a fire outside may not have occurred that far from the home. In every case, cooking locations seem to be variable, but, as expected, tend to center around the home.

Virtually no attention is given to where cooking for ceremonial events occurred, other than to mention that it did happen (Swanton 1946). Consumption of food was a critical component of many social and ceremonial gatherings of different sizes for Native American groups, yet little is said regarding how these events were organized and supported. Swanton (1946), citing work by Le Moyne, includes a drawing of Timucua individuals preparing food for a ceremonial event (Swanton 1946, Plate 53). These cooks are depicted working together outside over a large pot (with smaller vessels and tools nearby) to prepare the food for the up-coming event. While some of this image may be exaggerated, it does suggest that preparations for large feasts or ceremonies were conducted out in the open, possibly in the same communal areas where the event was to occur.

As feasts of different scales could be held at different locations, such as plazas or open areas, ceremonial lodges, the houses of leaders, or even the domestic house of a host (Clarke 2001; Hayden 2014), where cooking for these events took place was also likely variable. While little documentation exists, it is possible that cooking could have been done in private homes and then brought to the event (similar to a pot-luck) or that most of the cooking occurred at the host's home, depending on the type and scale of event. For example, in a Mascouten Bald Eagle Clan myth detailed by Skinner (1924-1927), a man holds an apology feast at his home, and has several helpers work to cook food for the event. In this case, preparations occurred at the man's home, not in a more conspicuous location. Similarly, consumption of these foods likely occurred in different locations based on the type and scale of event, meaning that serving dishes may have been used in a number of locations as well.

Based on the above information, some general expectations can be formed regarding where cooking occurred. In general, it is likely that most cooking occurred within a close radius of the home, both within and adjacent to a structure. During colder months, cooking occurred indoors, while food preparation took place outside during warmer months. While most cooking occurred around the home, some cooking also likely occurred in communal areas and possibly in special-use structures. Different vessels or cooking techniques may have been used in these different locations, as cooking done in special structures or communal areas may have been done specifically to supply ceremonial or multi-family events. These patterns, in turn, would impact where vessels were deposited once they were broken or no longer functional.

Using these results, a spatial model was created for the purposes of this analysis. This model is composed of three zones that encapsulate all of the possible areas in which cooking may have occurred. These three zones are: 1) within a structure, 2) within four meters of a structure, and 3) more than four meters away from a structure (Table 4.3; Figure 4.5). Four meters was chosen as an arbitrary baseline distance to divide outside contexts based on the ethnographic information above, as it is possible that this distance would be able to separate cooking done within or nearby temporary structures from cooking done in open areas that are not clearly associated with one structure. This model serves as the basis for the spatial analysis conducted to address Research Question 3, as it helps to account for differences in excavation methodology and sampling between the sites by generalizing provenience information into comparable categories.

Analysis and Comparisons

To address Research Question 3, the same samples used for use-alteration analyses were examined. Provenience information on each vessel (if available) was used to locate them within excavation areas at each site. Each vessel was then placed within one of the three zones within the spatial model outlined above, which enabled the exploration of what vessel types (jars, bowls, plates) and cooking techniques occurred in each zone and if there were any differences in prevalence between sites. These variations could indicate that foodways practices, or at least their spatial organization, differed between Morton Village and the comparative sites, or that certain vessel types or cooking techniques were only used in specific contexts, both of which can inform us about the hybridization of foodways and coalescence at Morton Village.

For the analysis, vessels with provenience information detailing feature or structure number were marked on maps for each site. Morton Village vessels were mapped on a GIS-based excavation map of the site that also includes a layer showing the locations of all possible structures detected during magnetometry surveys. For Larson, where two paper maps document spatial details, I created a digitized version of the two site maps using Inkscape, through which I was able to trace all feature, structure, and palisade outlines to create a new, digital version of the hand-drawn excavation maps. These new maps were created as Scalable Vector Graphic (SVG) files that can then be manipulated in basic ways to help visualize where vessels and cooking patterns are located.

Similar to Larson, I also used images of maps and Inkscape to create a manipulatable version of part of the Tremaine Complex excavations. Unfortunately, the complexity and scale of the site group complicates any analyses of spatial patterns. Since 42 out of 53 analyzed vessels from the Tremaine Complex were in Area H of the Tremaine Site, the main area of occupation, I decided to focus on this area for spatial analyses. As Area H contains evidence of seven longhouses and hundreds of features, including five feature clusters, I created a coarse map of this region that shows the general locations of structures and feature clusters, but does not include the outline of every individual post mold or feature; only features that include analyzed vessels were mapped.

Using these maps, vessels at each of the three sites were examined in two ways. Initially, vessels were placed into two broad categories: "inside a structure" and "outside a structure." Contexts were split in this way because ethnographic evidence indicates that cooking and consumption could happen in both locations, often based on seasonal patterns. As different types of food may have been available in warm versus cold seasons, examining cooking patterns in interior versus exterior contexts may reveal what cooking techniques were preferred during a specific season. While such patterns are possible, trash disposal practices and other factors may mask any seasonal differences at the sites.

After this initial analysis, exterior contexts were divided further, using the model outlined above. Vessels were placed into one of the three spatial categories: 1) within a structure, 2) within four meters of a structure, and 3) more than four meters away from a structure. These zones were established because they generally include the different possible cooking locations as indicated in ethnographic resources (Table 4.3; Figure 4.5), namely within or nearby homes and outside in communal areas. Further, separating vessels in this way will provide some indication of the various vessel types and cooking methods used in different outdoor contexts, and may uncover differences in practices used closer to the home versus those used in communal areas.

Table 4.3. Relationship of Spatial Categories to Cooking Locations

Spatial Category	**Ethnographic Cooking Location**
1) Within a structure	Cooking at an indoor hearth (cold season)
2) Within four meters of a structure	Cooking at an outdoor hearth near the home (warm season)
3) More than four meters from a structure	Cooking outside in a communal space

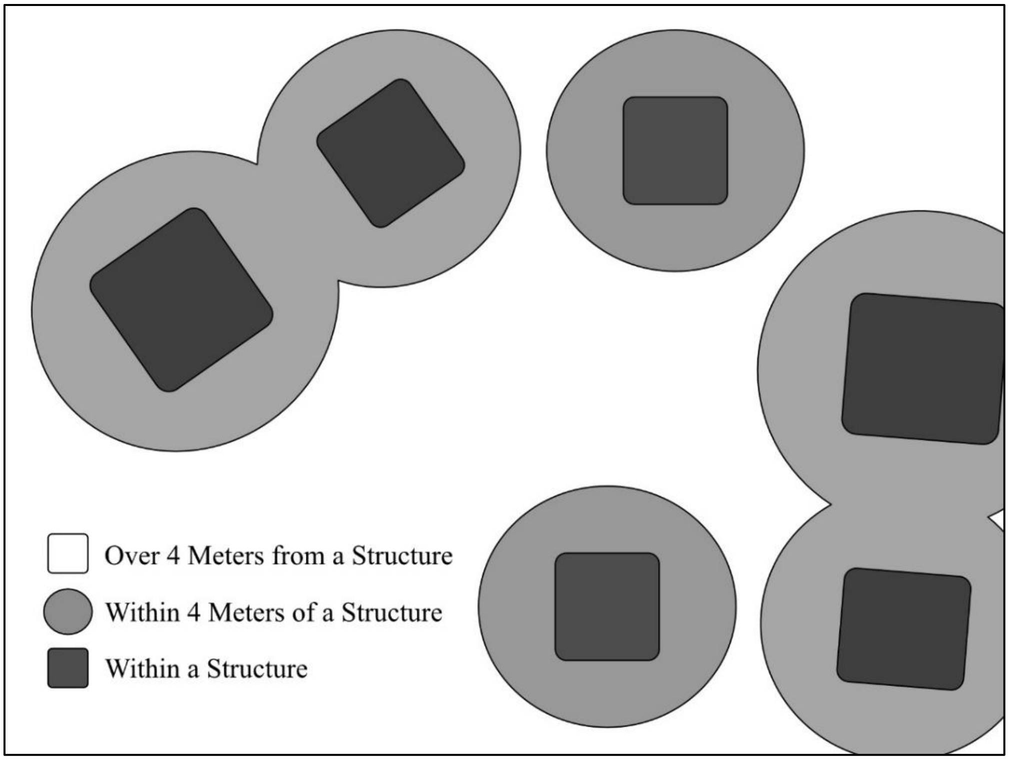

Figure 4.5. Visualization of the three spatial zones used for spatial analyses in this dissertation.

In general, vessels were placed into spatial categories based on their provenience. Vessels recovered from features were placed in a particular zone based on the location of the feature; for example, vessels from features found within structures were placed into the "within a structure" category. If a feature intersected with a structure wall, field notes were consulted to determine if the feature was created before, during, or after the use of the structure. If created before or after the structure, features were considered to be outside of that structure and their distance from adjacent structures was measured. Similar determinations were made for vessels found in test units or excavation blocks, depending on their relationship to particular structures. If test units were not directly associated with a structure, vessels recovered within them were placed into a category based on their distance from a structure, measured from the edge of the test unit. If a test unit or excavation block was associated with a structure, field notes were consulted to better understand the provenience of a vessel, such as if it was found at the outside edge of a structure, in basin fill, or on the floor of a structure. If a vessel was associated with the floor of a structure, it was categorized as “within a structure.” If a vessel was from a zone of basin fill, it was assumed that this vessel had been deposited as trash after the use of the structure (Deal 1985; LaMotta and Schiffer 1999), and therefore was not considered to be associated with that structure. Its distance from adjacent structures was then measured to determine if that particular provenience was closer or farther than four meters from nearby buildings. Due to lack of provenience information and field notes for some vessels, determinations of a vessel’s relationship to a structure could not always be made. For example, at Larson some vessel proveniences only include a structure number, so I am unable to differentiate any further the depositional position of those vessels. This is also true for a small number of vessels that were recovered from earlier excavations at Morton Village. In these cases, vessels were placed into the “within a structure” category, as they are associated with a structure, but this categorization may be misleading. Fortunately, most vessels had sufficient provenience information to avoid this issue.

After categorizations were completed, spatial patterns were first investigated at the community-scale to identify larger patterns within these communities. At each site, the distribution of different vessel types, such as bowls, plates, and jars, between the zones was examined first. Counts of different vessel types within the zones were tabulated, and then turned into a percentage that showed what proportion of the overall vessel type assemblage was present in each zone. For example, if 41 of 53 jars were found within structures at a site, that would represent 77.4% of the jar sample. This high frequency may suggest that most cooking at the site occurred indoors. These rates were then used to create a bar chart that visually displayed the data (showing the percentages of plates, bowls, and jars split between the spatial zones), helping to detect any differences in distribution. These data were compared between the sites to see if any general differences in the distribution of vessels could be discerned. Comparisons were made using both descriptive statistics and through Fisher's Exact test calculations performed in R (R Core Team 2020). Fisher's Exact tests were used to test the null hypothesis that the vessel type being compared between two assemblages was distributed in similar proportions among both assemblages. This hypothesis was rejected if the resulting probability value was 0.05 or lower, which indicates that differences in spatial distributions were due to variations in practice and not the vagaries of sampling.

After the village-scale analyses of the distribution of vessel types, the assemblage at Morton Village was examined again, but in this iteration divided into Mississippian- and Oneota-style vessels. This division was examined as a means to detect any distributional differences that may indicate meaningful variations in use between the two stylistic groups. The same methods outlined above were used, but while taking into account traditional vessel decorative style.

Once the distribution of vessel types across the sites had been examined, the prevalence of cooking techniques was then investigated. As with the analysis of vessel types, cooking techniques were first examined at the village-scale to detect larger patterns. Ceramic assemblages at each site were first broken down by vessel type, and were then categorized by cooking technique. Counts were tabulated and then turned into percentages representing the proportion of the overall presence of a particular cooking technique within a vessel type. For example, if 15 out of 21 plates used for serving at a site were found more than four meters away from a structure, that would represent 71.4% of plates used for serving. This majority could suggest that most serving and food presentation activities occurred away from homes, in communal areas at the site. In this way, it was possible to see where certain cooking techniques within particular vessel types were recovered and may have been used more frequently. Comparisons were then made between the sites using descriptive statistics. As sample sizes were commonly small in this part of the analysis, it was not possible to use statistical means to compare the data.

Again, once village-scale analyses were completed, the Morton Village assemblage was re-examined, with ceramic style taken into account. The Morton Village ceramic assemblage was again divided into Mississippian- and Oneota-style vessels for this part of the analysis, and the same methods used for the village-scale analysis were employed to detect any differences in the distribution of cooking techniques between these two stylistic groups.

Summary

In this chapter, I have outlined the methods that were used to address the three research questions examined in this dissertation. By looking at use-wear, as well as where on the sociospatial landscape vessels and specific functions were found, information related to cooking, serving, and foodways traditions will be generated at each site. By comparing these data sets, shifts in food practices can be identified that may have been involved in the process of coalescence at Morton Village. The results of these analyses will be reported in three chapters. Chapter 5 and 6 will provide detailed results of the use-alteration analyses, while Chapter 7 will summarize findings from the spatial analyses. These data will then be combined to examine the role of foodways in the process of coalescence at Morton Village in Chapter 8.

CHAPTER 5:

RESULTS OF SITE LEVEL CERAMIC USE-ALTERATION ANALYSIS

This chapter discusses the results of a ceramic use-alteration analysis of samples of vessels from Morton Village, the Tremaine Complex, and Larson. This analysis was performed to address Research Question 1, which seeks to investigate community level cooking and serving practices at Morton Village by treating all vessels from the site as one sample. Data from Morton Village was then compared to use-alteration data from Larson and the Tremaine Complex to uncover any differences in cooking and foodways practices between the sites, which will indicate if residents of Morton Village were adapting their foodways or trying to maintain previous foodways traditions. The analysis was completed following the methods outlined in Chapter 4.

This chapter begins by detailing the results of morphological analyses performed to determine if any major differences in vessel morphology existed between the samples. While minor differences are expected, the presence of major variations may relate to differences in vessel function. The results of morphological analyses are then followed by the results of site level ceramic use-alteration analyses, beginning with summaries of each site individually. Details of the results of functional comparisons between samples are then outlined. All analyses examined ceramic samples from each site. These samples are composed of 81 vessels from Larson (36 jars, 18 bowls, and 27 plates), 53 vessels from the Tremaine Complex (all jars), and 215 vessels from Morton Village (19 jars, nine bowls, and 31 plates are Mississippian-style; 68 jars, 28 bowls, and 11 plates are Oneota-style; and seven jars, 39 bowls, and three plates were indeterminate). For more discussion of these samples, see Chapter 4.

Results of Morphological Analyses

Before use-alteration analyses were completed, morphological analyses were undertaken to uncover any major variations in vessel shape that may have impacted the intended function of a particular vessel type (Henrickson and McDonald 1983; Skibo 2013; Smith 1988). Variations within vessel types, such as bowls, were also examined to uncover evidence of the production of more than one shape for that vessel class, which may indicate the presence of different intended functions. In this section, I will first summarize the results of morphological analyses for the four samples being considered here: Mississippian-style vessels at Morton Village, Oneota-style vessels at Morton Village, vessels from Larson, and vessels from the Tremaine Complex. I will then compare the results between these assemblages to uncover any variations in vessel shape present among the sites.

Mississippian-style vessels at Morton Village

The Mississippian-style vessel assemblage from Morton Village was made up of jars, bowls, and plates. All of the 19 Mississippian-style jars analyzed from Morton Village were generally globular in shape with everted rim. Estimated rim diameters for this assemblage averaged 24 cm, ranging from 15 to 32 cm in diameter (Table 5.1). When plotted as a histogram (Figure 5.5), estimated rim diameters formed a bimodal distribution, with a smaller grouping of jars with rim diameters from 15 to 21 cm and a larger grouping of jars with rim diameters from 26 to 32 cm. Based on other analyses of Mississippian ceramic assemblages (Boudreaux 2010; Hally 1986), it is likely that jar size classes were more complex than the pattern seen here, but the small sample size limits the detection of further groupings.

Shoulder diameters among this assemblage are not much larger, on average, than estimated rim diameters. Combined with larger shoulder angles on average, this indicates that Mississippian-style jars at Morton Village had sloping shoulders with slim bodies that did not extend far past the vessel rim. Jar rims averaged around 22 mm in height, 7.65 mm in thickness, and were not extremely everted as they possessed an average rim angle of almost 59 degrees. While they averaged about 22 mm in height, rim height did vary greatly, ranging from 16.39 to 27.80 mm. Much of this variation may be due to the relationship between rim height and jar size, as larger jars will in general possess taller rims. When compared using a scatterplot, there is a slight positive relationship between rim diameter and rim height, but more vessels are required to better understand this relationship (Figure 5.1). The bodies of Mississippian-style jars from Moton Village were thinner than the rims, with shoulder thickness being on average 1.5 mm thinner than rims. No bases were intact with this sample, so I cannot evaluate if body thickness was constant or thinned towards the base of the jars.

Table 5.1. Summary of Descriptive Statistics for Mississippian-Style Jars from Morton Village

Measurements	N	Mean	Standard Deviation
Rim Diameter (cm)	14	24.00	5.22
Shoulder Diameter (cm)	4	29.75	5.38
Rim Height (mm)	13	22.11	3.39
Rim Length (mm)	15	24.29	3.59
Rim Angle (deg)	13	58.85	13.41
Shoulder Angle (deg)	13	45.77	8.38
Rim Thickness (mm)	15	7.65	1.66
Shoulder Thickness (mm)	14	5.99	1.25
Base Thickness (mm)	N/A	N/A	N/A

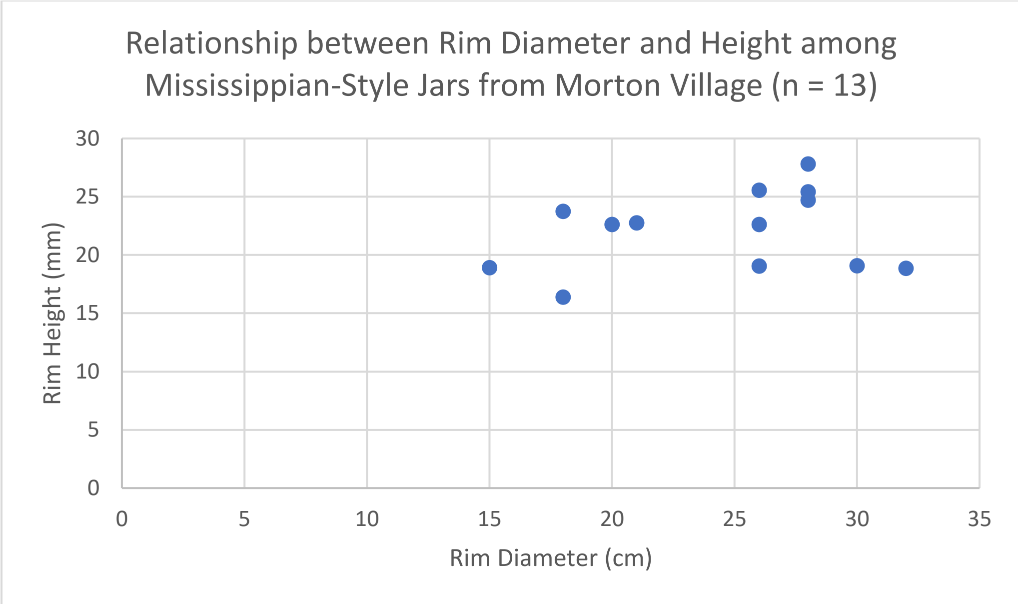

Figure 5.1. Scatterplot showing a slight positive relationship between rim diameter and rim height among Mississippian-style jars from Morton Village.

The nine Mississippian-style bowls from Morton Village were all hemispherical in shape, with the orifice forming the widest point of the vessel. Bowl rim diameters averaged 31.83 cm (Table 5.2), but ranged widely from 8 to 42 cm. Only one bowl was small in size (rim diameter of 8 cm), while the other bowls all had rim diameters of 32 cm or larger. This wide disparity indicates that Mississippian-style bowls were made in different sizes, but the full repertoire of bowls likely is not visible in this assemblage due to the small sample size (Figure 5.6). All bowls had rim angles of 75 degrees or greater, averaging 80 degrees, indicating that Mississippian-style bowls had relatively vertical walls and that no basin-shaped bowls were present in this sample. Lip, rim, and body thicknesses varied widely. For example, rim thicknesses among this sample ranged from 6 to 14.01 mm. Despite these wide ranges, on average, Mississippian-style bowls tended to be thickest at the rim, with lips and bodies that were thinner. No base sections were present, so it is unclear if bowl bodies continued to thin towards the base.

Table 5.2. Summary of Descriptive Statistics for Mississippian-Style Bowls from Morton Village			
Measurements	**N**	**Mean**	**Standard Deviation**
Rim Diameter (cm)	6	31.83	12.34
Rim Angle (deg)	5	80.00	5
Rim Thickness (mm)	8	9.29	2.88
Lip Thickness (mm)	7	8.42	1.99
Side Thickness (mm)	5	7.73	2.57
Base Thickness (mm)	N/A	N/A	N/A

A larger sample of Mississippian-style plates from Morton Village were available for analysis, totaling 31 plates. All of the plates were flatter vessels composed of wide rims and inset wells, with the widest point of the vessel being at the lip (Table 5.3). Mississippian-style plates possessed an average rim diameter of 29 cm, but rim diameters ranged widely, from 14 to 42 cm. When visualized as a histogram, the rim diameter data from a rough unimodal distribution with a peak around 30 to 35 cm (Figure 5.7). This distribution suggests that Mississippian-style plates were made in one core size (30 to 35 cm in diameter), accompanied by larger and smaller outliers. Due to the wide spread for the rim diameter data, it is also possible that these plates were made in multiple size classes, which are not all visible in the current sample.

Rim height and length were generally large, but did range widely, averaging 46.11 mm and 69.94 mm respectively. These wide rims would have provided ample space for decoration and also likely increased the overall size of the vessels. Rim angles also ranged widely, from 15 to 75 degrees, forming a bimodal distribution with peaks at 25 to 30 degrees and 40 to 45 degrees (Figure 5.8). This distribution suggests that Mississippian-style plates at Morton Village were made in two shapes, one that is flat and more plate-like (25to 30 degrees) and one that is more bowl-like (40 to 45 degrees). Based on lip, rim, and base thicknesses, Mississippian-style plates tended to be thickest at the mid-rim point. They then grew thinner at the lip and towards the base. The base of the well was much thinner, on average, than the rim, suggesting that the wall of the well in general was thinner compared to the rest of the vessel.

Table 5.3. Summary of Descriptive Statistics for Mississippian-Style Plates from Morton Village

Measurements	N	Mean	Standard Deviation
Rim Diameter (cm)	17	29.00	7.63
Rim Height (mm)	10	46.11	15.31
Rim Length (mm)	14	69.94	18.10
Rim Angle (deg)	17	40.29	17.36
Rim Thickness (mm)	26	7.55	1.29
Lip Thickness (mm)	22	6.27	0.96
Base Thickness (mm)	9	4.69	0.95

Oneota-style vessels at Morton Village

Like the Mississippian-style sample, the Oneota-style vessel assemblage from Morton Village was made up of jars, bowls, and plates. All of the 68 Oneota-style jars from Morton Village analyzed in this dissertation were globular in shape with everted rims. Rim diameter measurements from this sample averaged 21.45 cm, but ranged widely from 6 to 38cm (Table 5.4). When plotted as a histogram (Figure 5.5), a multi-modal distribution was formed, indicating the presence of a number of different jar size classes. Generally, these size classes are extra-small (6 cm), small (10 to 18 cm), medium (21 to 24 cm), large (26 to 32 cm), and extra-large (34 to 38 cm). Most jars fall into the small, medium, or large size classes, with the small size class being slightly more prevalent. Shoulder diameter data demonstrate that jar bodies extended outward past the widest point of vessel rims. Coupled with a more horizontal average shoulder angle, Oneota-style jars from Morton Village had bodies that were relatively wide and squat in shape.

Jar rims were tall, with an average height of 28.59 mm, and were not extremely everted. While many rims were tall, rim height measurements varied widely, from 12.62 to 48.92 mm. Some of this variation can be explained by the relationship between vessel size (based on rim diameter) and rim height. When entered into a scatterplot, there is a clear positive relationship between rim diameter and rim height among Oneota-style jars from Morton Village, demonstrating that jar rims get progressively taller as vessel size increases (Figure 5.2). Rims also appear to have been the thickest part of the vessel. Thickness measurements from the rim, shoulder and base show a decrease in average thickness as one moved from the rim down to the base of the jar.

Table 5.4. Summary of Descriptive Statistics for Oneota-Style Jars from Morton Village

Measurements	N	Mean	Standard Deviation
Rim Diameter (cm)	55	21.45	7.74
Shoulder Diameter (cm)	30	30.13	10.23
Rim Height (mm)	53	28.59	8.90
Rim Length (mm)	59	30.30	9.75
Rim Angle (deg)	54	59.35	8.69
Shoulder Angle (deg)	41	40.66	8.38
Rim Thickness (mm)	62	7.43	1.61
Shoulder Thickness (mm)	67	6.07	1.63
Base Thickness (mm)	4	3.75	1.00

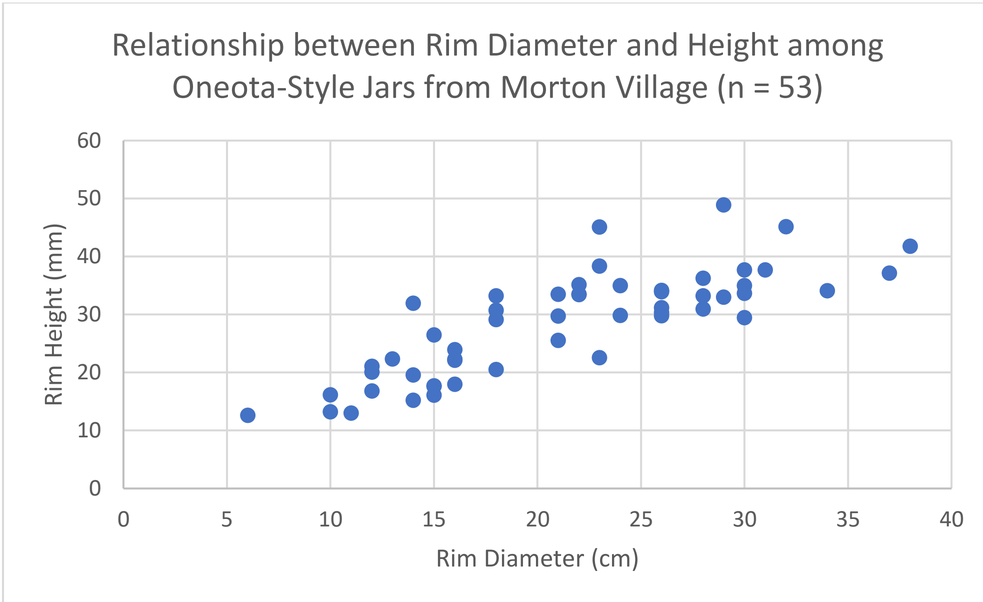

Figure 5.2. Scatterplot showing the relationships between rim diameter and rim height among Oneota-style jars from Morton Village.

The 28 Oneota-style bowls from Morton Village were all hemispherical in shape with their widest points at the orifice. Bowl rim diameters ranged widely from 14 to 50 cm, but averaged about 27 cm in diameter (Table 5.5). These data form a multi-modal distribution when plotted as a histogram (Figure 5.6), with peaks suggesting the presence of three size classes. These bowl size classes are small (14 to 26 cm), medium (27 to 32 cm), and large (36-50 cm), with the majority of bowls falling into the small and medium categories. Rim angle measurements also varied widely among Oneota-style bowls, from 40 to 90 degrees, with a majority having rim angles of 70 degrees or larger. A few bowls do have relatively shallow rim angles, which may signal the use of two types of Oneota-style bowls: basin-like and steep-sided. Based on lip, rim, side, and base thicknesses, Oneota-style bowls from Morton Village tend to be thickest at the rim. Bowls then get progressively thinner moving toward the base, with the base being the thinnest point of the vessel.

Table 5.5. Summary of Descriptive Statistics for Oneota-Style Bowls from Morton Village			
Measurements	**N**	**Mean**	**Standard Deviation**
Rim Diameter (cm)	25	27.32	8.41
Rim Angle (deg)	22	71.81	12.78
Rim Thickness (mm)	27	7.85	1.42
Lip Thickness (mm)	27	6.53	1.22
Side Thickness (mm)	13	6.41	1.51
Base Thickness (mm)	11	5.40	1.19

A smaller sample of 11 Oneota-style plates from Morton Village were analyzed for this dissertation. All 11 plates possessed a flatter profile with wide rims and inset wells, and had an average rim diameter of 30.71 cm (Table 5.6). When visualized in a histogram, these rim diameter data formed a unimodal distribution, with a peak around 30 cm accompanied by smaller and larger outliers (Figure 5.7). This pattern suggests that Oneota-style plates at Morton Village were made in one core size with rim diameters around 30 cm. Each plate had a long rim, averaging 63.35 mm, providing plenty of space for decoration. Plate rim angles averaged nearly 46 degrees, creating a more bowl-like shape. Most plates followed this pattern, with rim angles ranging from 40 to 55 degrees, but one plate did possess a rim angle of 25 degrees, creating a shallower, more plate-like shape. This vessel may indicate that Oneota-style plates were made in two forms, one flatter and one more bowl-like, but a larger sample size is required to ensure that this one vessel is not just an outlier.

Oneota-style plates from Morton Village appear to have been thickest at the mid-rim, but rim thickness did vary widely from 60.6 to 11.46 mm, so this trend may not be apparent for all vessels. Plate lips and bases were thinner on average than the rim, with the well and base likely being the thinnest area for each vessel.

Table 5.6. Summary of Descriptive Statistics for Oneota-Style Plates from Morton Village			
Measurements	**N**	**Mean**	**Standard Deviation**
Rim Diameter (cm)	7	30.71	5.88
Rim Height (mm)	N/A	N/A	N/A
Rim Length (mm)	4	63.35	10.71
Rim Angle (deg)	6	45.83	11.58
Rim Thickness (mm)	11	8.46	1.61
Lip Thickness (mm)	9	5.46	1.30
Base Thickness (mm)	4	5.27	0.92

Larson

Like at Morton Village, the Larson ceramic assemblage is made up of jars, bowls, and plates. Among the 36 jars present in the Larson sample, rim diameter measurements ranged from 12 to 36 cm, with an average rim diameter of about 23 cm (Table 5.7). When visualized as a histogram (Figure 5.5), this data forms a multimodal distribution and can be broken down into three possible size classes: small (12 to 18 cm), medium (21 to 31 cm), and large (32 to 36 cm). Most jars fall into the small and medium categories, with jars split relatively evenly between those two size classes. Average shoulder diameter data suggest that Larson jars were relatively narrow and not much wider than the rim diameter of the vessel. Upon closer examination, these numbers do appear skewed, as a majority of the shoulder diameter measurements were collected from smaller jars, which led to a smaller average shoulder diameter than would commonly be present on larger jars. When data was examined by individual vessel, shoulder diameters still did not extend very far past the greatest extent of the rim. Coupled with a more steeply sloping shoulder angle on average, Larson jars may still have possessed relatively narrow vessel bodies.

Alongside narrow bodies, Larson jars had rims that were generally short, averaging just 16.36 mm in rim height, and that were not extremely everted. Rim height measurements at Larson do vary widely, and, except for one outlier, are positively correlated to vessel size (Figure 5.3). Rims also appear to be the thickest part of Larson jars, with walls that become slightly thinner as they move towards the base of the vessel. While the body is thinner, the shoulder and base are similar thicknesses on average.

Table 5.7. Summary of Descriptive Statistics for Jars from Larson

Measurements	N	Mean	Standard Deviation
Rim Diameter (cm)	31	23.10	7.85
Shoulder Diameter (cm)	9	23.33	9.55
Rim Height (mm)	31	16.36	5.77
Rim Length (mm)	33	18.62	6.07
Rim Angle (deg)	29	52.41	14.12
Shoulder Angle (deg)	29	46.72	9.19
Rim Thickness (mm)	35	7.32	2.04
Shoulder Thickness (mm)	36	6.31	1.59
Base Thickness (mm)	3	6.65	1.73

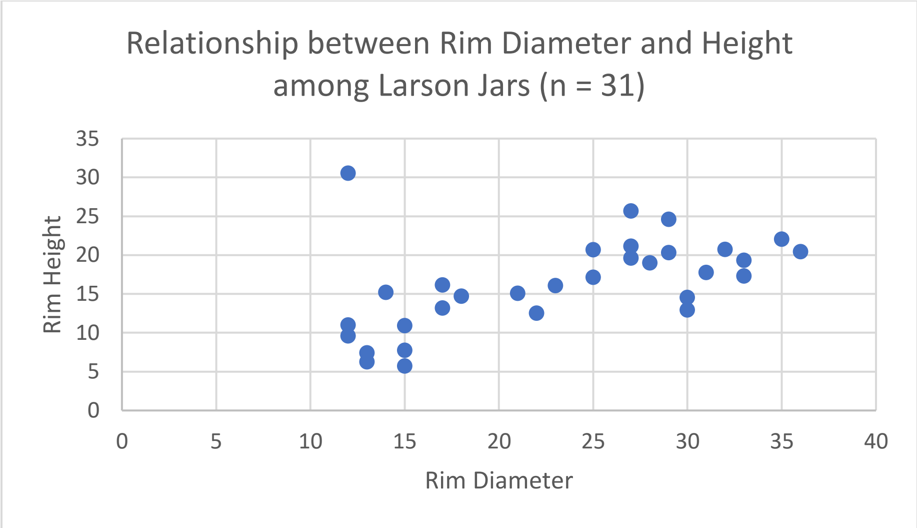

Figure 5.3. Scatterplot showing the relationship between rim diameter and rim height among jars from Larson.

Among the 18 bowls from Larson, all were hemispherical in shape and all but one were widest at the orifice. The average rim diameter for these bowls was 25.29 cm, but ranged widely from 11 to 43 cm (Table 5.7). This wide range indicates that different bowl sizes existed, but this sample is too small and widely spread to confidently identify any clear groupings (Figure 5.6). Despite this, rim diameter data does demonstrate that bowls of various sizes, including small, medium, and large, were made and used at the site. Like rim diameter data, the rim angle measurements also varied widely, ranging from 50 to 90 degrees, with one bowl having a constricted rim angle of 120 degrees. The majority of bowls had rim angles from 50 to 65 degrees, with a minority having rim angles from 70 to 90 degrees. These data reveal that not only were different sizes of bowls present, but that a variety of bowl shapes were also used at Larson, including basin-shaped, steep-sided, and constricted rim bowls. On average, Larson bowls were thickest at the lip and then became progressively thinner, with the base constituting the thinnest point of the vessel.

Table 5.8. Summary of Descriptive Statistics for Bowls from Larson			
Measurements	**N**	**Mean**	**Standard Deviation**
Rim Diameter (cm)	14	25.29	10.40
Rim Angle (deg)	16	67.81	17.12
Rim Thickness (mm)	18	7.69	1.86
Lip Thickness (mm)	18	8.55	2.57
Side Thickness (mm)	9	7.38	1.70
Base Thickness (mm)	4	5.99	1.76

Of the 27 plates in the Larson sample, all had a flatter shape with wide rims and an inset well. Plate rim diameters from the site averaged around 28 cm (Table 5.8) and form a unimodal distribution when plotted as a histogram (Figure 5.7), suggesting that Larson plates were made in one core size (25 to 30 cm in diameter) with smaller and larger outliers. Rim height and length measurements varied within the sample, for example rim lengths ranged from 25.42 to 65.47 mm, but generally all plates had rims that were relatively large, providing space for decorative elaboration. Rim angles averaged 32.63 degrees and, like the rim diameter data, formed a unimodal distribution (Figure 5.8), suggesting that plates from Larson were made in one shape, which was flat and more plate-like. Thickness data demonstrate that Larson plates had thinner lips, with rims and wells that were slightly thicker. Based on their average, bases were the thickest point of Larson plates, but one plate had a base thickness of nearly 15 mm, skewing the average. When that measurement is removed, base thickness averaged about 7 mm, so it is likely that the rims and bases of plates from Larson possessed similar thicknesses.

Table 5.9. Summary of Descriptive Statistics for Plates from Larson			
Measurements	**N**	**Mean**	**Standard Deviation**
Rim Diameter (cm)	18	28.17	4.79
Rim Height (mm)	18	19.63	8.61
Rim Length (mm)	21	41.54	12.87
Rim Angle (deg)	19	32.63	6.95
Rim Thickness (mm)	27	7.34	1.38
Lip Thickness (mm)	22	6.01	1.18
Base Thickness (mm)	6	8.26	3.66

The Tremaine Complex

At the Tremaine Complex, jars were the only vessel type used in domestic contexts; bowls, plates, and other vessel types were not present. Of the 53 jars included in the vessel sample for the Tremaine Complex, all were globular in shape with everted rims. While rim diameter measurements from this sample ranged from 14 to 36 cm, the sample as a whole had a large rim diameter average of 28.40 cm (Table 5.9). Three jar size classes are apparent when the rim diameter data are plotted as a histogram (Figure 5.5): small (14 to 17 cm), medium (20 to 28 cm), and large (30 to 36 cm). The majority of jars in the sample fall into the large size class, explaining the large average rim diameter for this sample of jars. The average shoulder diameter for jars from the Tremaine Complex is also large, extending well past the widest extent of the average rim diameter. Coupled with an average shoulder angle that indicates a more horizontal shoulder, jars from the Tremaine Complex appear to have had wide, squat bodies.

These wider bodies are associated with taller rims, based on average rim height and length measurements, which have a slight positive relationship with rim diameter (Figure 5.4). These taller rims also tended to be more vertical in orientation. While the average rim angle was around 65 degrees, about half of the jars have relatively vertical rim angles of 70 degrees or larger, making the rims appear even taller. Rims were also relatively thick, and may have been the thickest part of the vessel. Measurements of shoulder thickness indicate that vessel bodies thinned as they moved toward the base of the vessel, but unfortunately no base thickness measurements are available to determine if the base was the thinnest section of the vessel or not.

Table 5.10. Summary of Descriptive Statistics for Jars from the Tremaine Complex

Measurements	N	Mean	Standard Deviation
Rim Diameter (cm)	40	28.40	5.92
Shoulder Diameter (cm)	10	38.70	10.08
Rim Height (mm)	49	31.47	9.27
Rim Length (mm)	41	37.90	6.47
Rim Angle (deg)	49	65.00	12.46
Shoulder Angle (deg)	48	36.04	10.41
Rim Thickness (mm)	48	8.08	1.85
Shoulder Thickness (mm)	41	5.93	1.31
Base Thickness (mm)	0	N/A	N/A

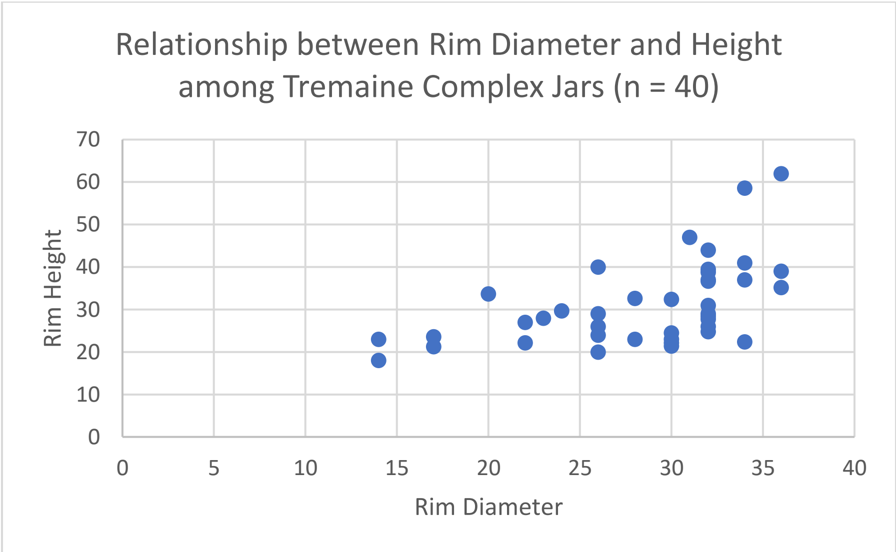

Figure 5.4. Scatterplot showing the relationship between rim diameter and rim height among jars from the Tremaine Complex.

Morphological Comparisons

In general, vessels within each sample were morphologically similar. All jars were globular in shape with everted rims, the vast majority of bowls were hemispherical with wide orifices, and all plates had wide, flat rims with in-set wells. While all vessels shared a general morphology, small variations in shape between the four samples are present.

Jars

Among the jar vessel class, jars from the Tremaine Complex were significantly larger than all other samples in both rim diameter and shoulder diameter (Table 5.10). Jar sizes were generally similar among the other three samples. While Larson jars had a significantly smaller average shoulder diameter than all other samples, most of the observations of shoulder diameter from that site came from smaller vessels (those with rim diameters under 20 cm), likely skewing the results.

Table 5.11. Results of Jar Metric Comparisons using Welch's Two-Sample T-Tests (Statistically Significant Results at the 0.05 Level in Bold and Italics)

MV Mississippian- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	14	31	36.574	-0.456	0.6514
Shoulder Diameter (cm)	4	9	9.965	-1.540	0.1548
Rim Height (mm)	***13***	***32***	***37.050***	***-4.148***	***0.0002***
Rim Length (mm)	***15***	***33***	***42.554***	***-4.029***	***0.0002***
Rim Angle (deg)	13	29	24.316	-1.414	0.1701
Shoulder Angle (deg)	13	29	25.279	0.331	0.7432
Rim Thickness (mm)	15	35	32.366	-0.613	0.5438
Shoulder Thickness (mm)	14	36	30.181	0.758	0.4542
MV Mississippian- MV Oneota					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	14	55	29.398	1.462	0.1545
Shoulder Diameter (cm)	4	30	6.442	0.117	0.9104
Rim Height (mm)	***13***	***53***	***52.371***	***-4.199***	***0.0001***
Rim Length (mm)	***15***	***59***	***62.528***	***-3.835***	***0.0003***
Rim Angle (deg)	13	54	14.516	-0.130	0.8987
Shoulder Angle (deg)	13	53	18.357	1.970	0.0641
Rim Thickness (mm)	15	62	20.833	0.477	0.6385
Shoulder Thickness (mm)	14	67	23.251	-0.209	0.8364
MV Mississippian- Tremaine					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	***14***	***40***	***25.606***	***-2.620***	***0.0146***
Shoulder Diameter (cm)	4	10	10.465	-2.147	0.0562
Rim Height (mm)	***13***	***49***	***53.883***	***-5.760***	***4.15E-07***
Rim Length (mm)	***15***	***41***	***44.801***	***-9.952***	***6.35E-13***
Rim Angle (deg)	13	49	17.891	-1.493	0.1530
Shoulder Angle (deg)	***13***	***48***	***23.113***	***3.515***	***0.0018***
Rim Thickness (mm)	15	48	25.843	-0.850	0.4032
Shoulder Thickness (mm)	14	41	23.428	0.138	0.8914

Table 5.11 (Cont'd).					
MV Oneota- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	55	31	61.609	0.937	0.3526
Shoulder Diameter (cm)	30	9	14.000	-1.842	0.0868
Rim Height (mm)	***53***	***32***	***82.511***	***-7.680***	***2.90E-11***
Rim Length (mm)	***59***	***33***	***88.865***	***-7.083***	***3.19E-10***
Rim Angle (deg)	***54***	***29***	***39.685***	***-2.412***	***0.0206***
Shoulder Angle (deg)	***53***	***29***	***53.341***	***2.946***	***0.0048***
Rim Thickness (mm)	62	35	58.106	-0.277	0.7826
Shoulder Thickness (mm)	67	36	72.955	0.731	0.4672
MV Oneota- Tremaine					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	***55***	***40***	***92.733***	***-4.957***	***3.22E-06***
Shoulder Diameter (cm)	***30***	***10***	***15.676***	***-2.319***	***0.0343***
Rim Height (mm)	53	49	98.576	-1.598	0.1133
Rim Length (mm)	***59***	***41***	***97.832***	***-4.699***	***8.56E-06***
Rim Angle (deg)	***54***	***49***	***84.774***	***-2.643***	***0.0098***
Shoulder Angle (deg)	***53***	***48***	***90.237***	***2.439***	***0.0167***
Rim Thickness (mm)	62	48	93.378	-1.949	0.0543
Shoulder Thickness (mm)	67	41	98.321	0.475	0.6360
Tremaine- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	***40***	***31***	***54.181***	***-3.135***	***0.0028***
Shoulder Diameter (cm)	***10***	***9***	***16.943***	***-3.411***	***0.0033***
Rim Height (mm)	***49***	***32***	***78.869***	***-9.036***	***8.39E-14***
Rim Length (mm)	***41***	***33***	***70.254***	***-13.214***	***2.20E-16***
Rim Angle (deg)	***49***	***29***	***53.167***	***-3.972***	***0.0002***
Shoulder Angle (deg)	***48***	***29***	***65.006***	***4.698***	***1.41E-05***
Rim Thickness (mm)	***48***	***35***	***69.139***	***-1.758***	***0.0831***
Shoulder Thickness (mm)	41	36	67.763	1.128	0.2635

When histograms plotting rim diameter observations were examined (Figure 5.5), other patterns related to jar size became apparent. In general, a similar spread of jar sizes, based on estimated rim diameter, was present within each sample. Jar rim diameters among all of the samples range from six to 38 cm, and each possessed a multi-modal distribution with two or three groupings that indicate the presence of different size classes of jars. While all samples possessed similar size classes, the frequency of observations within those size classes varied. Within the Larson and Oneota-style Morton Village sample, a greater number of jars were small and had rim diameters of less than 20 cm, while the majority of jars in the Tremaine Complex sample were larger and had rim diameters of 26 cm or greater. The Mississippian-style sample from Morton Village, while smaller, is nearly evenly split between larger and smaller jars, but, despite its much smaller sample size, has the same number of jars with rim diameters of 20 cm or smaller as the Tremaine Complex sample. This emphasis on larger jars at the Tremaine Complex likely helps to explain the significant difference in jar size as seen in the comparison of mean rim and shoulder diameter between the samples.

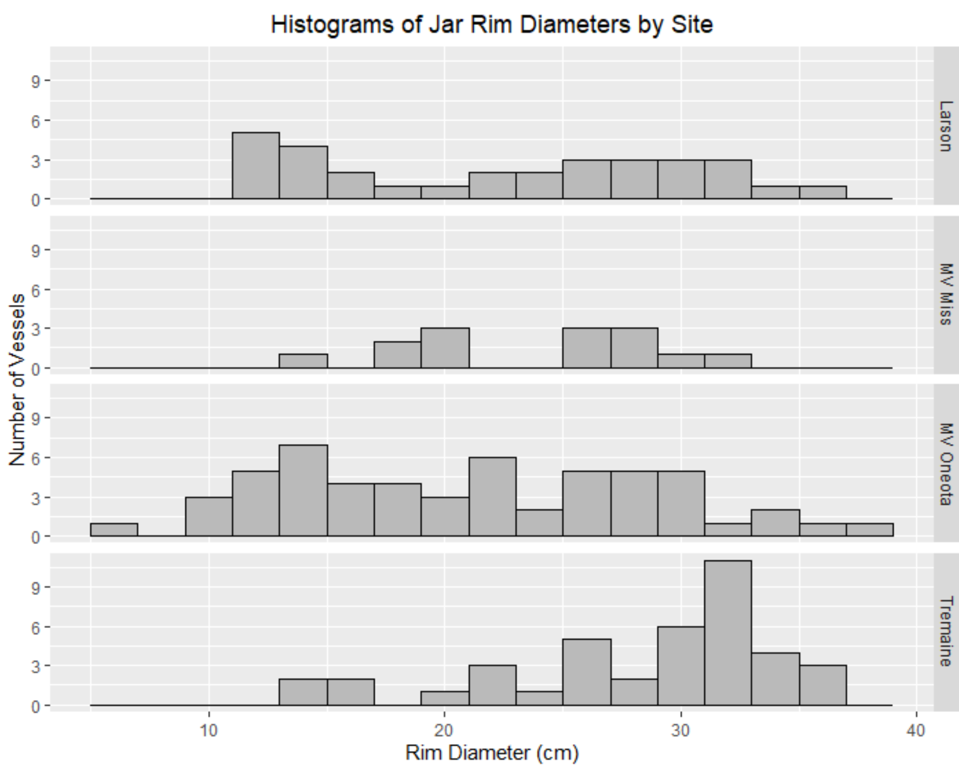

Figure 5.5. Stacked histograms displaying jar rim diameter data from all four assemblages.

Significant differences also exist among measurements of rim length and rim height (Table 5.10). Overall, Mississippian-style vessels from Morton Village and Larson had shorter rims compared to the Oneota-style vessels from Morton Village and the Tremaine Complex. Interestingly, Oneota-style vessels from Morton Village, while still having taller rims than their Mississippian-style counterparts, had rims that were significantly smaller than Tremaine Complex jars, placing them in an intermediate size category.

Alongside differences in jar size, shoulder angles also differed among the samples, likely having impacts on vessel capacity (Table 5.10). Overall, Mississippian-style vessels from Larson and Morton Village had shoulders that were angled more vertically, creating a narrower vessel body. Jars from the Tremaine Complex, which were the largest in size, also possessed shoulders that were more horizontally angled, suggesting that they may have more squat bodies. Combined with their larger size, Tremaine Complex jars likely had the largest vessel capacities of any sample considered here. Oneota-style jars from Morton Village once again fall into an intermediate category, which had shoulder angles significantly different from the other three jar samples.

Similar to shoulder angle, jar rim angle varied, especially between Larson and the Tremaine Complex. Larson jar rims were significantly more everted when compared to all other samples, while Tremaine Complex jar rims were the least everted. Mississippian-style and Oneota-style vessels from Morton Village were both similar to each other, and fell into an intermediate group in between Larson and the Tremaine Complex.

Overall, the two jar samples that possessed the widest differences in morphology were Larson and the Tremaine Complex, which had significant differences in every measured characteristic except shoulder thickness (Table 5.10). At the opposite extreme were the two

Mississippian-style samples, Morton Village and Larson, which were similar morphologically except in rim height and length. Interestingly, there were many significant differences present between the two Oneota-style samples, Morton Village and the Tremaine Complex. Instead, the Oneota-style jars from Morton Village were morphologically closest to the Mississippian-style jars from Morton Village.

While significant differences in jar morphology between the four samples do exist, it is unlikely that all of these differences were necessitated by a need to fit different functional uses, as characteristics like rim thickness and rim angle may not have had a direct impact on improving how a vessel functioned (for example, making a better boiling versus roasting pot). Instead, many of these differences likely relate to variations in technological style and potting traditions between the samples (Gosselain 1998; Hegmon et al. 2000). This would also help explain why the Mississippian assemblages and Morton Village vessels are more similar, as potters at Morton Village shared close social interactions and those living at Larson may have been the direct ancestors of some residents of Morton Village. Two morphological variants that may relate to function are the greater size of Tremaine Complex jars and the taller rims present on Oneota-style jars. Taller rims may have been adopted on Oneota-style jars as a means of helping prevent boil-overs during wet mode cooking, but may have also been a preferred stylistic trait as well. Similarly, vessel size can relate to vessel function in certain ways, for instance some cooking and food processing techniques, such as nixtamalization, require larger pots to hold the necessary quantities of water and food, but size can also relate to the number of people being fed or other factors (Blitz 1993; Cheetham 2009; Mills 1999). In this case, the Tremaine Complex was the location of a community that lived in multi-family longhouses (O’Gorman 1995), within which multiple family groups may have cooked and eaten together (Bolton 1987; Brown 1970).

As such, larger pots would be required to cook the necessary amounts of food. At Larson and Morton Village, residents lived in smaller, single family structures (Bengtson and O'Gorman 2016; Harn 1994; Santure et al. 1990), which would have served as a home for fewer people. As such, frequent commensality, instead of major differences in how the pots were used, may account for the documented differences in jar size between these samples. It is also possible that jars at Morton Village and Larson may have been used not only as cooking vessels, but also as individual consumption vessels or special-use implements, therefore requiring the production of more small vessels than at the Tremaine Complex.

Bowls

Measured morphological characteristics between the three samples that contained bowls (Larson and Mississippian- and Oneota-style vessels from Morton Village) varied less than among the jars. Most measured characteristics possessed similar means, other than lip thickness and rim angle (Table 5.11). Among these two characteristics, Oneota-style bowls from Morton Village had significantly thinner lips than the other two samples and Mississippian-style bowls from Morton Village had a significantly steeper rim angle. This difference in rim angle is due to the presence of different shaped bowls among the samples, as Mississippian-style bowls from Morton Village were all steep-sided while Oneota-style bowls from Morton Village and bowls from Larson were made in both steep-sided and basin-like forms. While not found to be clearly significant by t-test comparisons, it is also notable that bowl rim form may have varied between Larson and Morton Village. At Morton Village, mean lip and rim thicknesses suggest that most bowls, including both Oneota- and Mississippian-style bowls, possessed rims that began with thinner lips and then thickened towards the mid-rim of the bowl. This pattern is the opposite at

Larson, where mean thicknesses indicate that bowl rims had their thickest point at the lip and then got gradually thinner as one moved towards the body.

Table 5.12. Results of Bowl Metric Comparisons using Welch's Two-Sample T-Tests (Statistically Significant Results at the 0.05 Level in Bold and Italics)

MV Mississippian- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	6	14	8.219	-1.138	0.2871
Rim Angle (deg)	***5***	***16***	***18.998***	***-2.523***	***0.0207***
Rim Thickness (mm)	8	18	9.706	-1.450	0.1787
Lip Thickness (mm)	7	18	14.194	0.134	0.8950
Side Thickness (mm)	5	9	5.989	-0.276	0.7916
Base Thickness (mm)	N/A	N/A	N/A	N/A	N/A
MV Mississippian- MV Oneota					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	6	25	6.163	0.850	0.4271
Rim Angle (deg)	***5***	***22***	***17.385***	***2.322***	***0.0326***
Rim Thickness (mm)	8	27	8.033	1.372	0.2073
Lip Thickness (mm)	***7***	***27***	***7.218***	***2.401***	***0.0464***
Side Thickness (mm)	5	13	5.010	1.081	0.3283
Base Thickness (mm)	N/A	N/A	N/A	N/A	N/A
MV Oneota- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	25	14	22.627	-0.626	0.5376
Rim Angle (deg)	22	16	26.500	-0.789	0.4369
Rim Thickness (mm)	27	18	29.797	-0.312	0.7569
Lip Thickness (mm)	***27***	***18***	***22.119***	***3.112***	***0.0050***
Side Thickness (mm)	13	9	15.979	1.377	0.1874
Base Thickness (mm)	11	4	4.038	0.618	0.5696

Histograms of estimated rim diameters also document some similar trends among the bowls from the three samples (Figure 5.6). Within all three groups, bowl size varied widely, ranging from eight to 50 cm in diameter at the orifice. The combination of a wide spread along with a multi-modal distribution suggests that different bowl size classes likely existed, but unfortunately, sample sizes for two of the three samples are too small to differentiate trends within size distributions. Oneota-style bowls from Morton Village, which has a larger sample size, appears to have three different size classes: small (14-26 cm), medium (27-32 cm), and large (36-50 cm). As all samples have observations of a wide variety of vessel sizes, it is possible that each sample contained similar size classes.

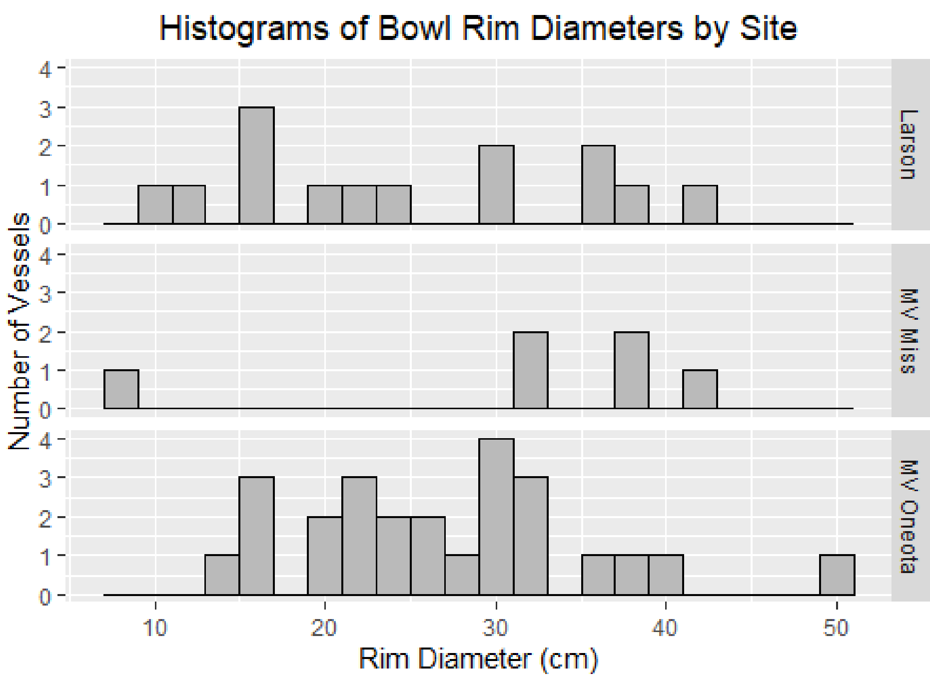

Figure 5.6. Stacked histograms displaying bowl rim diameter data from each assemblage.

As a whole, all three bowl samples were morphologically similar (Table 5.11). One of the few major differences between the samples was in rim angle measurements, whose data indicate that only one type of bowl shape was present among the Mississippian-style bowl sample from Morton Village while two or more bowl shapes were present in the other two samples.

Plates

Unlike bowls, there were some major variations in measured characteristics among the three samples that included plates (Larson and Mississippian- and Oneota-style vessels from Morton Village). While many characteristics did not differ significantly from each other, rim length, height, and angle all varied considerably between Larson and Morton Village(Table 5.12). Morton Village plates, including both Oneota- and Mississippian-style vessels, had significantly longer and taller rims than those plates from Larson. Larson plates also had a significantly lower rim angle compared to the Morton Village plates. Combined, these traits give plates from Morton Village a larger surface area for decorative motifs and a more bowl-like shape, while plates from Larson are flatter in appearance and more plate-like.

Table 5.13. Results of Plate Metric Comparisons using Welch's Two-Sample T-Tests (Statistically Significant Results at the 0.05 Level in Bold and Italics)					
MV Mississippian- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	17	18	26.657	-0.384	0.7038
Rim Height (mm)	***10***	***18***	***12.239***	***-5.043***	***0.0003***
Rim Length (mm)	***14***	***21***	***21.638***	***-5.077***	***4.59E-05***
Rim Angle (deg)	17	19	20.536	-1.702	0.1039
Rim Thickness (mm)	26	27	50.952	-0.556	0.5810
Lip Thickness (mm)	22	22	40.269	-0.807	0.4246
Base Thickness (mm)	9	6	5.449	2.345	0.0618
MV Mississippian- MV Oneota					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	17	7	14.582	-0.593	0.5625
Rim Height (mm)	N/A	N/A	N/A	N/A	N/A
Rim Length (mm)	14	4	8.576	0.913	0.3860
Rim Angle (deg)	17	6	13.435	-0.875	0.3971
Rim Thickness (mm)	26	11	15.713	-1.670	0.1148
Lip Thickness (mm)	22	9	11.763	1.682	0.1189
Base Thickness (mm)	9	4	5.995	-1.048	0.3352
MV Oneota- Larson					
Measurements	N1	N2	df	t-value	p-value
Rim Diameter (cm)	7	18	9.283	-1.022	0.3327
Rim Height (mm)	N/A	N/A	N/A	N/A	N/A
Rim Length (mm)	***4***	***21***	***4.822***	***-3.606***	***0.0164***
Rim Angle (deg)	***6***	***19***	***6.178***	***-2.646***	***0.0372***
Rim Thickness (mm)	11	27	16.351	-2.020	0.0601
Lip Thickness (mm)	9	22	13.783	1.083	0.2973
Base Thickness (mm)	4	6	5.903	1.917	0.1045

Aside from these major differences, minor variations were also present. While sample sizes for this measurement were small, Larson plates tend to possess a significantly thicker base compared to both types of Morton Village plates, but this could be a factor of one large measurement skewing the results at Larson. Interestingly, the only significant difference between the Oneota-style and Mississippian-style plates from Morton Village was that the Oneota-style plates had thicker rims overall compared to their Mississippian-style counterparts from Morton Village and Larson. Besides rim thickness, all Morton Village plates examined here were similar morphologically.

Rim diameter and rim angle observations from the three samples also presented some variations in shape. Rim diameter measurements among the three samples ranged widely, from 14 to 42 cm, with the Mississippian-style plates from Morton Village possessing the widest range. While the Oneota-style sample from Morton Village is limited by sample size, all three assemblages tend to form unimodal distributions (Figure 5.7). This suggests that instead of multiple size classes, plate sizes tended to center around a core size (around 25-32 cm in diameter) that was accompanied by larger and smaller plates. Rim angle data varied more between the assemblages. While histograms (Figure 5.8) show that rim angle data among Larson plates and Oneota-style plates from Morton Village have a smaller range and tend to form unimodal distributions, plate rim angles among Mississippian-style plates from Morton Village have a larger spread and form a bimodal distribution, with peaks at 25-30 degrees and 40-45 degrees, along with some larger outliers. Based on this data, it is possible that two distinct Mississippian-style plate forms were present at Morton Village, with some plates that are more plate-like and others that are more bowl-like.

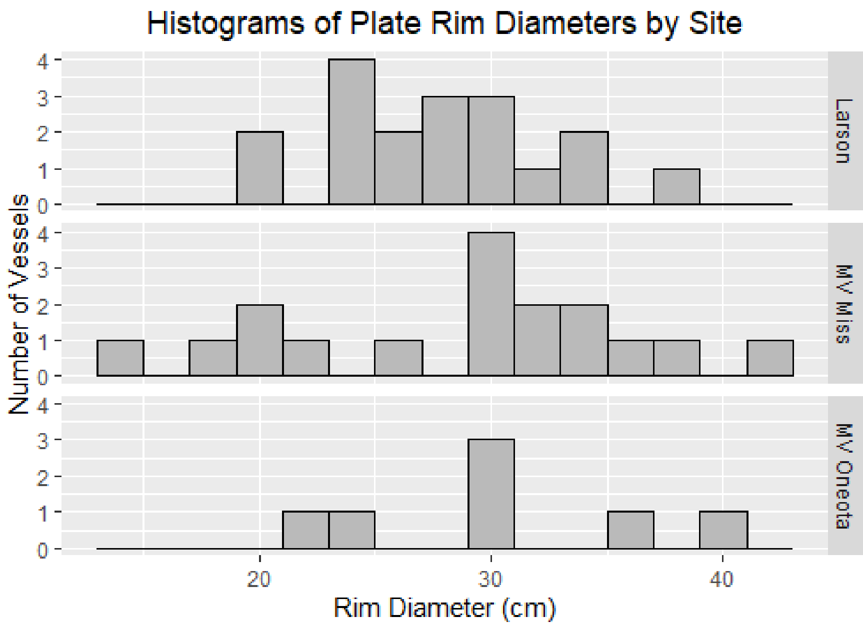

Figure 5.7. Stacked histograms displaying plate rim diameter data from each assemblage.

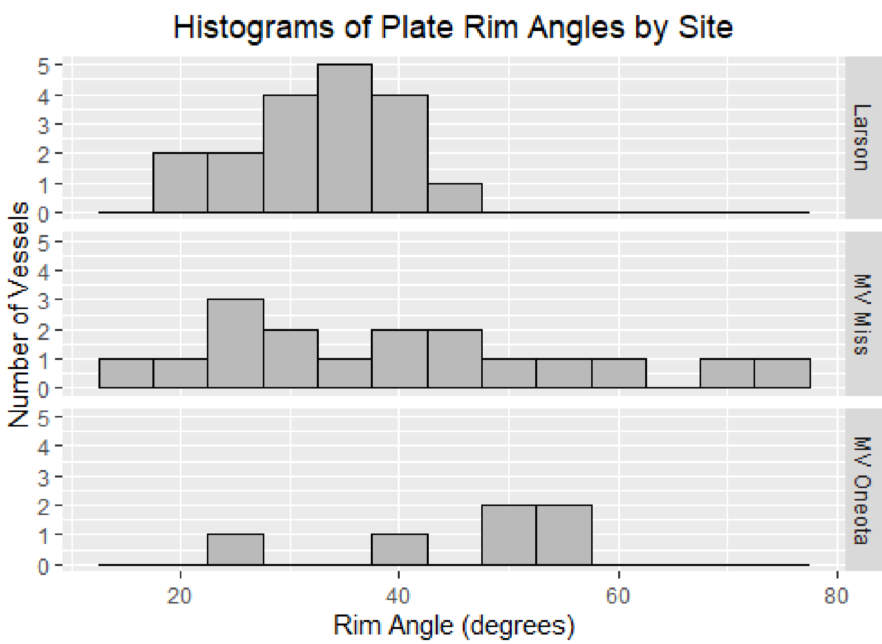

Figure 5.8. Stacked histograms displaying plate rim angle data from each assemblage.

Similar to the jars examined here, variations seen among plate samples may relate to both technological style and changes in vessel function. Wider plate rims provide a larger canvas for decoration, allowing for the application of new or larger and more visible motifs. As plates are typically considered serving or presentation vessels (Hilgeman 2000; Steponaitus 1984), this increased space for decoration may have been desirable. Alternatively, in combination with larger rim angles, the taller rims also create a deeper, more bowl-like shape. This bowl-like shape may have been better for manipulating or heating liquid foods, and may have increased the amount of food the plates could hold. The thinner base of plates at Morton Village may have also increased thermal shock resistance and heat transference (Bowen and Harry 2019), making those plates better for heating or quick cooking techniques.

Site Level Analysis of Use-Alteration

After morphological comparisons were completed, site level analyses of ceramic use-alteration data were conducted to address Research Question 1. Initially, use-alteration data was examined at each site individually. Results were then compared between the sites to detect differences in vessel use patterns.

Morton Village

At Morton Village, a number of vessel types can be found, with the three main types being jars, bowls, and plates. Jars (n = 94) were used in a variety of ways, with stewing/multi-purpose vessels composing the largest percentage at 31.9% (Figure 5.9). Other functions include storage or serving (23.4%), wet mode cooking (14.9%), dry mode cooking (5.3%), multi-purpose use (10.6%), decoction (1.1%), and a possible griddle (1.1%). 11.7% of the jars from Morton

Village possessed anomalous carbonization patterns and were placed in an unknown functional category. In order to better account for the prevalence of wet and dry mode cooking, the number of distinct multi-purpose jars, which include evidence for both cooking techniques, were added to the wet and dry categories. After this adjustment, 25.5% of Morton Village jars possess evidence of wet mode cooking, while 16% of jars had evidence of the dry mode technique.

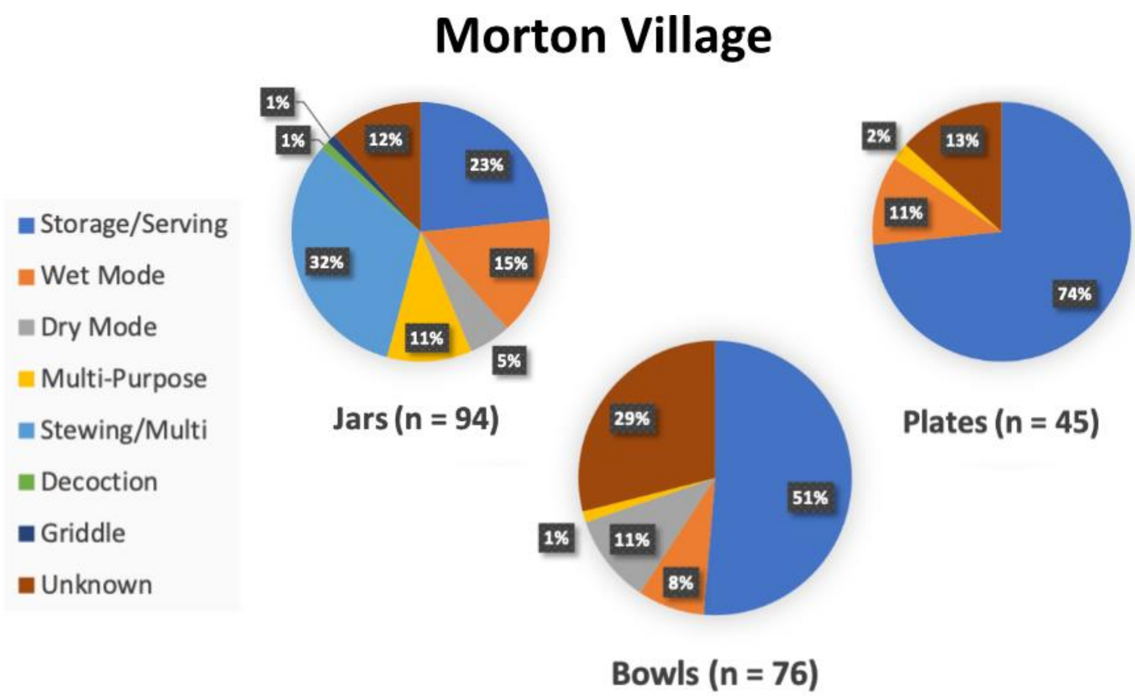

Figure 5.9. Pie charts summarizing the overall functions of jars, bowls, and plates at Morton Village.

Exterior sooting on Morton Village jars was more uniform. 60.6% of analyzed jars had sooting on their top half, while 28.7% had no evidence of soot, 4.3% had sooting on the base of the vessel, 4.3% had sooting all over the vessel body, and 2.1% had amorphous sooting. Overall, it appears that most jars that were used for cooking were not suspended, but were placed directly onto a hearth.

As jars varied widely in size, vessel function was also examined in relation to different vessel size classes (n = 75). At the site level, Morton Village jars were broken down into three size classes, based on a multi-modal distribution of rim diameter measurements (Figure 5.10). These size classes are small (rim diameters from 6 to 18 cm), medium (20 to 31 cm), and large (32 to 38 cm). In general, all three size classes were used for both cooking and storage or serving purposes, and no size class appears to have served a more specialized role. This observation is further supported by the results of a Welch's ANOVA test, which found no significant differences (F [5, 14.383] = 0.350, $p = 0.874$) between the mean rim diameters of the different functional groups. While there are few statistical differences that relate to vessel size and function, one trend becomes apparent when the data is examined visually. Overall, larger percentages of small and large jars (30% and 50% respectively) were used as storage or serving vessels, compared to only 12.8% of medium-sized jars. Instead, medium-sized jars appear to have been the primary cooking vessels.

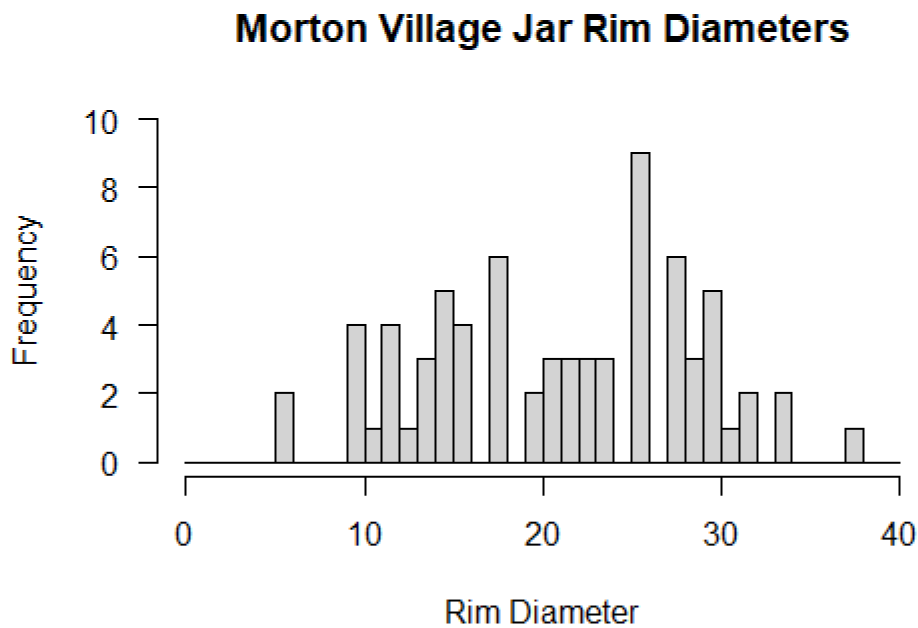

Figure 5.10. Histogram displaying rim diameter data from jars at Morton Village.

Bowls (n = 76) from Morton Village, like jars, were used for both serving/storage and cooking purposes, with about half of the bowls being used for each (Figure 5.9). Just over 51% of bowls were used for serving or short-term storage, while 7.9% were used for wet mode cooking, 10.5% for dry mode cooking, 1.3% for multi-purpose use, and 29% were used in unknown ways. Many bowls with unknown functions (14 of 22, or 63.6%) possessed sooting on their exterior, indicating that the bowls had been used over a fire, but had no interior carbonization evidence, making it difficult to discern a more specific function. As only one bowl functioned as a multi-purpose vessel, the percentages of wet and dry mode cooking techniques among bowls did not change greatly (9.2% and 11.8% respectively) once counts were adjusted to account for multi-functional pots.

Exterior sooting data indicates that, like jars, bowls at Morton Village were also placed directly over a hearth when used for cooking. While 56.6% of bowls did not possess exterior sooting, 34.2% of bowls had soot only on their top half. Only 1.3% of bowls had soot on their base, 5.3% had soot all over their body, and 2.6% had amorphous sooting patterns, indicating that bowls were rarely suspended over a hearth.

Bowl sizes, based on rim diameter measurements (n = 62), varied widely at Morton Village, ranging from 8 to 51 cm in diameter. While the assemblage is generally unimodal in shape when rim diameter measurements are plotted in a histogram, there are a number of smaller groupings that become visible (Figure 5.11). These groupings are 8 to 18 cm, 20 to 25 cm, 26 to 33 cm, 34 to 42 cm, and 45 to 51 cm. All possible bowl size classes were used for both serving/storage and cooking at a similar rate, indicating that no size class served a more specialized function. This is supported by a Welch's ANOVA test, which found no significant difference (F [3,12.987] = 0.182, $p = 0.907$) in the mean bowl size used for the different functional groups. Instead, vessel size may relate more to the quantity of food being processed or served and not to function alone.

Alongside different size classes, it is also possible that different bowl shapes were present at Morton Village. Bowl rim angles (n = 57) at the site ranged from 40 to 90 degrees, with most bowls having rim angles of 60 degrees or greater. Such a wide range of rim angles suggests that both basin-like and steep-sided bowls were present at the site, but there is no clear break in the measurements denoting where the two groups split. To explore whether bowls with different rim angles were used for different functions, the sample of 57 bowls with rim angle data was divided into two groups, those with rim angles of 55 degrees or smaller (basin-like) and those with rim angles greater than 55 degrees (steep-sided), and their functions were compared. In general, vessel function was relatively similar between both groups, but basin-shaped bowls were used more frequently for serving/storage. Among the six basin-like bowls, 66.7% were used for serving or storage and 33.3% were used for cooking, while 47.1% of the 51 steep-sided bowls were used for serving or storage and 52.9% were used for cooking.

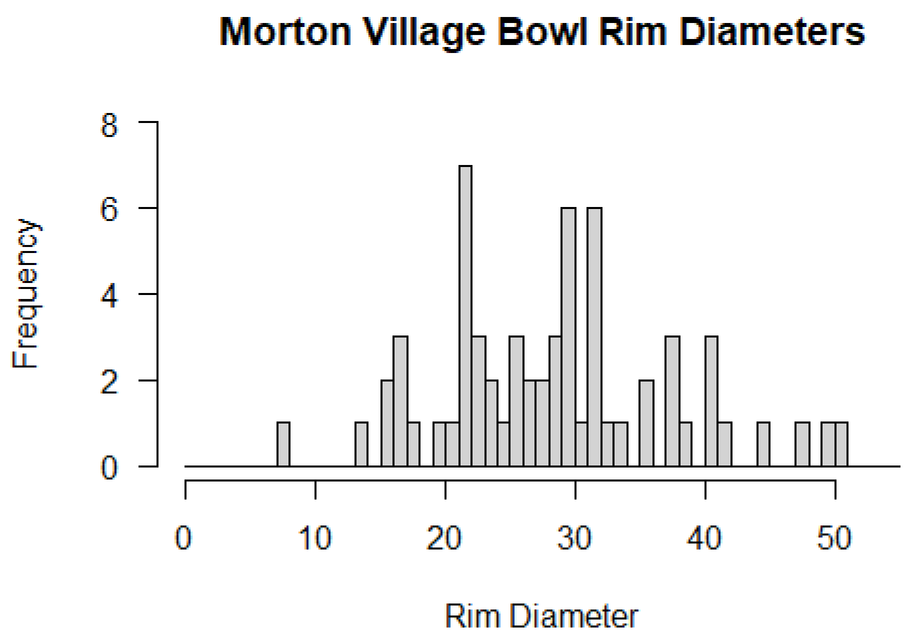

Figure 5.11. Histogram displaying rim diameter data from bowls at Morton Village.

Unlike bowls and jars, plates (n = 45) from Morton Village served a more restricted function. Overall, 73.3% of plates were used for serving or short-term storage (Figure 5.9). As plates are commonly considered serving vessels in the archaeological literature (Hilgeman 2000; Steponaitus 1984), this result was expected. What is surprising is that some plates were also used for cooking or other purposes. In total, 11.1% of plates from Morton Village were used for wet mode cooking, 2.2% were used as a multi-purpose tool, and 13.3% had unknown functions.

Mirroring the functional results, most plates (80%) did not have any exterior sooting present. Of those on which sooting was present, it was primarily found on the exterior rims of the vessel, not the base. Only two plates (4.4% of the total assemblage) had sooting present on their base, indicating that when plates were used for cooking or food processing, they were commonly placed directly on the hearth.

Like jars and bowls, plate size, based on rim diameter measurements (n = 25), varied at Morton Village, ranging from 14 cm in diameter up to 42 cm. As stated in the morphological results section, when plotted in a histogram, plate rim diameter measurements generally follow a unimodal distribution, indicating that plates commonly came in one primary size class, with larger and smaller variants also present (Figure 5.12). At Morton Village, rim diameters followed this same pattern, but clear breaks between three groupings were present. These rim diameter groupings were 14 to 26 cm, 30 to 32 cm, and 35 to 42 cm. In general, all three groupings were primarily used for serving or short-term storage vessels and there were no major differences in function. This is supported by a Welch's ANOVA test, which determined that no significant differences (F [2, 4.591] = 0.299, p = 0.755) in mean rim diameter were present between the functional groupings. While no major differences were present, small and medium-sized plates were used more frequently for cooking or food processing, 33.3% and 44.4% respectively, while large plates were used almost exclusively as serving or storage vessels (85.7%).

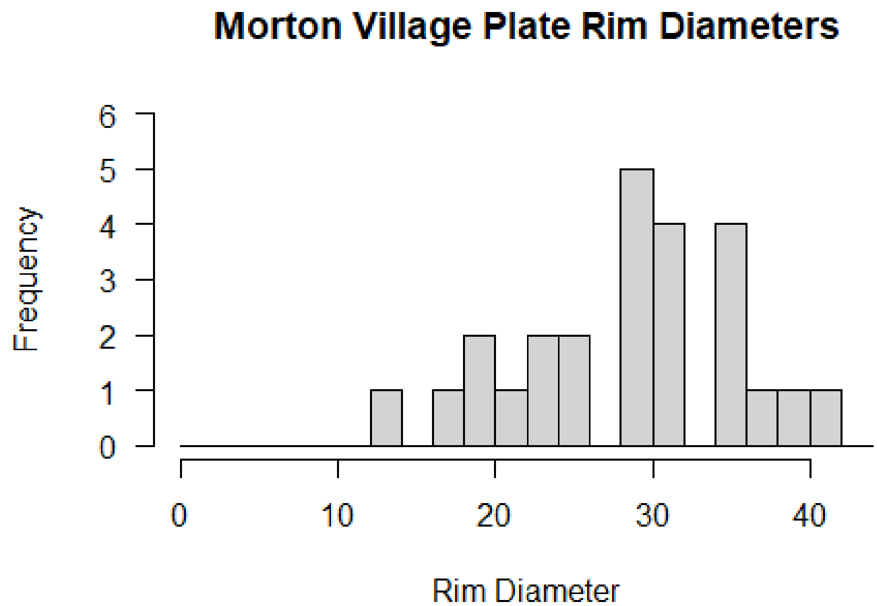

Figure 5.12. Histogram displaying rim diameter data from plates at Morton Village.

Among plates, the relationship between rim angle and function was also investigated (n = 24). As mentioned in Chapter 4, plates from Morton Village have rim angles that vary widely, creating flatter or more bowl-like versions of the plate form. A histogram of rim angle data from the site (Figure 5.13) shows a bi-modal distribution, with one peak around rim angles of approximately 25 to 30 degrees (flatter in shape) and a second peak around rim angles of 45 to 50 degrees (more bowl-like). Plates with rim angles outside of these two groups are also present. When a Welch's ANOVA test was conducted on this data, no significant differences (F [2, 6.861] = 1.103, p = 0.384) between the mean rim angles of different functional groups was found, but this test may have been hampered by the small sample sizes present in the non-serving/storage categories, such as wet mode cooking, which was only represented by five vessels. When examined visually and with descriptive statistics, some trends become visible. In general, while vessels in both rim angle groupings were used for serving/storage and cooking, more vessels with larger rim angles, those vessels that were more bowl-like in shape, were used more for cooking or food processing compared to the flatter vessels. Of those plates that had rim angles of 40 degrees or lower (n = 11), 72.7% were used for serving or storage and 27.3% were used for cooking. Of those plates with rim angles of 45 degrees or greater (n = 13), only 53.8% were used for storage and serving and 46.2% were used for cooking. While the small sample sizes must be taken into account, it does appear that rim angle may have played a role in plate function at Morton Village.

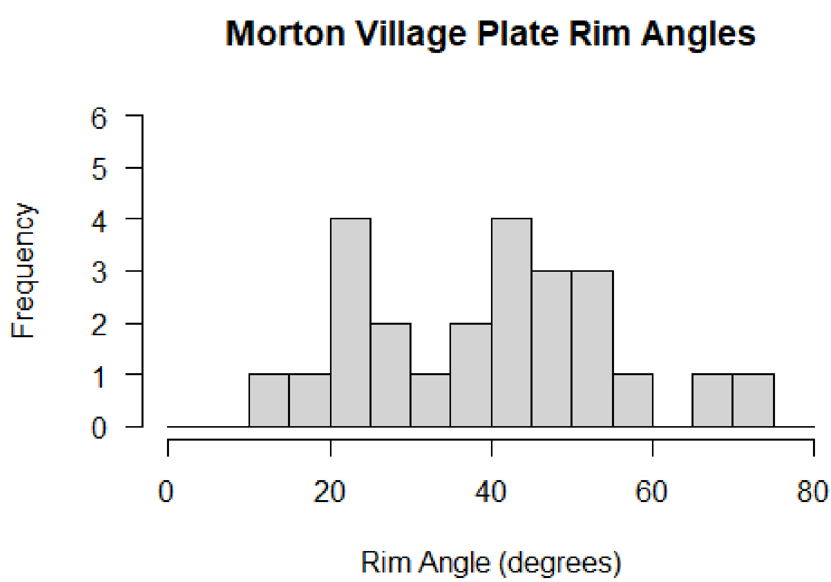

Figure 5.13. Histogram displaying rim angle data from plates at Morton Village.

Larson

Similar to Morton Village, a number of different vessel types can be found at Larson, but the three primary forms are jars, bowls, and plates. Jars (n = 36) from Larson were used in a variety of ways, with no function dominating the assemblage (Figure 5.14). At Larson, 16.7% of jars were used for storage or serving, 16.7% for wet mode cooking, 19.4% for dry mode cooking, 2.78% for multi-purpose uses, 19.4% for stewing or multi-purpose vessels, 2.8% as a possible griddle, and 22.2% were used in unknown ways. As only one vessel was used as a distinct multi-purpose tool, the rates of wet and dry mode cooking did not change substantially once the multi-purpose vessel was accounted for (19.4% and 22.2% respectively).

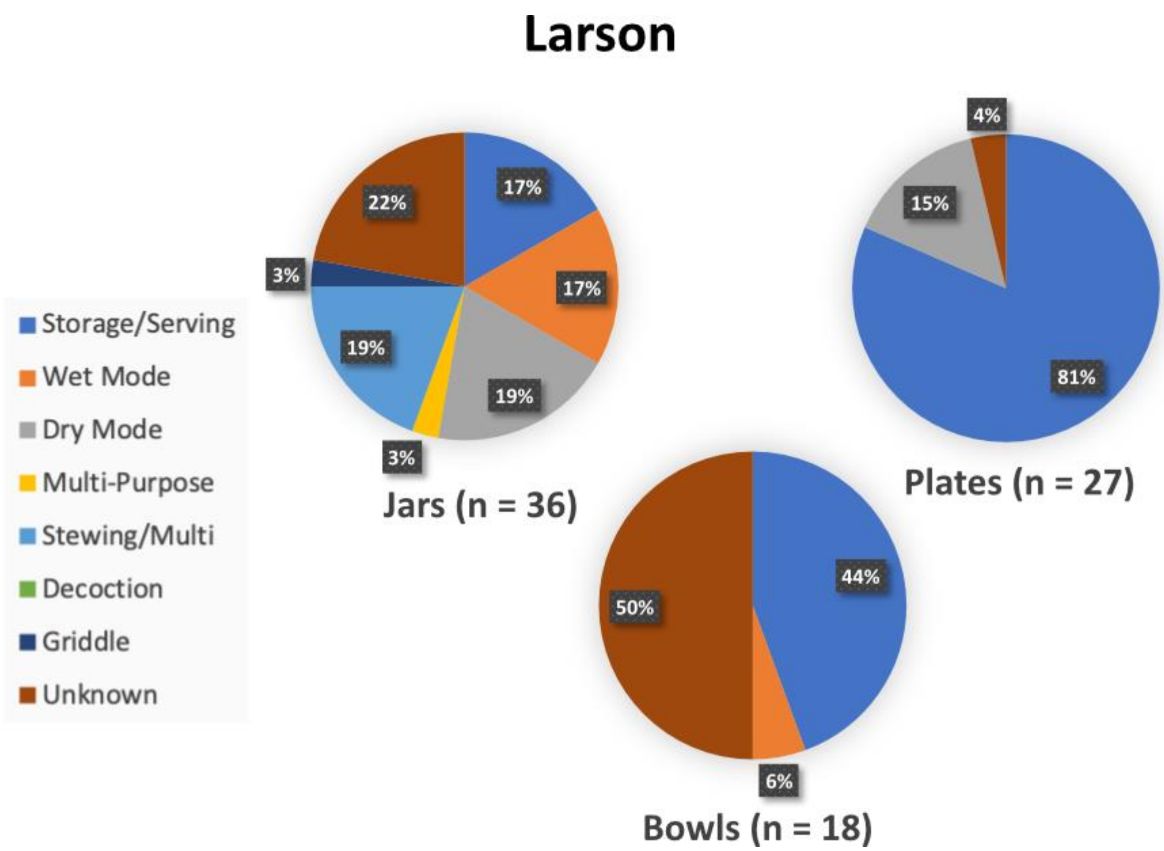

Figure 5.14. Pie charts summarizing the overall functions of jars, bowls, and plates at Larson.

Exterior sooting patterns on jars, when present, were commonly found on the top half of the vessel only, indicating that jars were placed directly on a hearth when used for cooking. Overall, 30.6% of jars at Larson did not possess any exterior sooting, 63.9% had sooting on the top half of the vessel, and only 5.6% of jars had sooting all over their body. No jars had sooting on the base only.

When the relationship between jar size and function was examined (n = 31 jars), no major differences were apparent. When rim diameter measurements from Larson jars are plotted into a histogram, a multi-modal distribution is formed with three possible size classes visible (Figure 5.5). Those sizes are jars with rim diameters from 12 to 18 cm, those with rim diameters from 21 to 31 cm, and those with rim diameters ranging from 32 to 36 cm. In general, each size class was used for both storage/serving and a variety of cooking techniques, and this argument is supported by a Welch's ANOVA test that found no significant differences (F [4, 9.364] = 0.127, p = 0.969) between the mean rim diameter of the functional groups. While no major differences were present, it does appear that small jars were used more frequently as cooking vessels, as only one (8.3% of small jars) had been used for storage/serving, while medium vessels were used more commonly for storage or serving purposes (21.4% of medium jars).

Bowls at Larson (n = 18), similar to jars, were used for both serving/storage and cooking purposes (Figure 5.14). Unfortunately, use-alteration data for Larson bowls is unclear as to what types of cooking techniques were used. Overall, 44.4% of bowls were used as serving or short-term storage vessels, 5.6% were used for wet mode cooking, and 50% were used for unknown purposes. A larger number of bowls had sooting on their exterior surface, indicating that had been used over a hearth, but had no clear carbonization on their interiors, leading to such a large percentage of bowls with unknown functions. As the base of a bowl was not always present for examination, some of these vessels could have been used for dry mode cooking, which may not be visible if the vessel base is missing, but would lead to the presence of soot on the exterior walls of the bowl. Alternatively, ethnographic accounts mention the use of bowls as a form of heating cover or Dutch Oven, where the cook would place uncooked dough or other foods on a flat surface, cover the food with an upside-down bowl, and then mound hot coals over the bowl to act as a heating source (Hally 1986:269; Swanton 1946:355-357). Such a cooking technique might lead to the development of soot on the exterior of a bowl and leave the interior surfaces unaltered, but experimental work would be necessary to confirm such an argument.

Exterior sooting, as with the jars from Larson, also indicates that bowls likely were placed directly on the hearth when used for cooking. While 44.4% of bowls did not possess exterior sooting, 38.9% had sooting only on their side walls. 5.6% of bowls did have sooting on their base, but not the side walls, and 11.1% had soot all over the vessel body.

When bowl function was explored in relation to vessel size (n = 14), some trends in use did become apparent. In general, with such a small sample of bowls, determining size classes was difficult. When rim diameter measurements were plotted into a histogram (Figure 5.6), four groupings were visible: 11 to 17 cm, 20 to 25 cm, 30 cm, and 36 to 43 cm. While it is possible these groupings do not represent true size categories, breaking vessel function down in this way did reveal some variations in how different sized bowls were used. Overall, bowls in each grouping were used for both cooking and serving or storage, but the number of bowls that filled these functions differed between the size groupings. This trend is best seen by comparing the smallest and largest size groupings. Among the small bowls (11 to 17 cm), 80% were used for storage or serving, while only 20% were used for cooking. These numbers are the complete opposite for the large bowls (36 to 43 cm), among which only 25% of bowls were used for storage/serving and 75% were used for cooking. Bowls among the two medium-sized categories were generally used about half the time for cooking and half the time for serving or storage. Welch's ANOVA results (F [1, 10.006] = 3.431, p = 0.094), while not significant at the 0.05

level, do corroborate the possibility that there are meaningful differences in how certain sized bowls were used. At Larson, data indicates that larger bowls were used more frequently for cooking, while smaller bowls were used more frequently for serving or storage, possibly as serving vessels for individuals or small groups.

Some trends also became apparent when the relationship between bowl rim angle and function were explored. At Larson, bowl rim angles (n = 16) vary widely, ranging from 50 to 120 degrees, with many bowls having rim angles of 65 degrees or smaller, suggesting that basin-like, steep-sided, and constricted rim bowls were present at the site. As with the Morton Village bowls, the Larson bowl sample was divided into two groups, those with rim angles of 55 degrees or smaller (basin-like) and those with rim angles greater than 55 degrees (steep-sided), in order to determine if the use of bowls with different shapes varied or not. For this comparison, the one bowl with a rim angle greater than 90 degrees was not included, as this bowl clearly fits into its own category. Among those bowls with rim angles of 55 degrees or smaller (n = 4), 75% were used for serving or storage, while only 25% were used for cooking. Interestingly, the opposite pattern is apparent with the bowls with larger rim angles (n = 11), of which 36.4% were used for serving or storage and 63.6% for cooking. This pattern becomes even more extreme if the basin-like group is expanded to include those bowls with rim angles of around 60 degrees. In general, while sample sizes are small, it appears that basin-like bowls may have functioned more frequently as serving or storage vessels while steeper-sided bowls were used more often for cooking.

Plates at Larson (n = 27), the last vessel type analyzed at the site, served a much more restricted purpose compared to jars and bowls. Out of the 27 plates examined, 81.5% were used as serving or short-term storage vessels, while 14.8% were used for dry mode cooking and 3.7%

were used for unknown functions (Figure 5.14). At Larson, it appears that most plates were used as non-cooking vessels, likely as vessels for food presentation and serving.

While most plates were not used over a fire, a few did have evidence of exterior sooting. Out of the whole Larson plate assemblage, only 11.1% of plates had sooting on their exterior rims, while 3.7% had sooting on their base and 3.7% had soot all over their exterior. Like jars and bowls from Larson, plates that were used for cooking were typically placed directly onto the hearth instead of being suspended.

When plate function was considered alongside plate size, no differences in function between plate sizes were found. When plotted as a histogram, plate rim diameter measurements formed a unimodal distribution, indicating that plates at Larson were made in one general size, with smaller and larger outliers present (Figure 5.7). For this assemblage, small outliers had rim diameters between 20 to 21 cm, the primary (medium) size group had rim diameters between 24 and 31 cm, and large outliers had rim diameters ranging from 33 to 38 cm. Plates in each size group primarily functioned as serving vessels, but the medium and large groups both also contained a small percentage of cooking vessels as well. No cooking vessels were present in the small outlier group. A Welch's ANOVA test further confirmed that there are no significant differences (F [1, 3.028] = 0.116, p = 0.756) in how the three plate size groupings functioned at Larson.

Like in the rim diameter measurements, rim angle measurements also formed a unimodal distribution when plotted as a histogram, indicating that there was no clear sub-grouping of plates with different body shapes present at Larson (Figure 5.8). Function also does not appear to significantly correlate with rim angle, although more data may be needed to confidently assess this relationship. In general, there appear to be no major differences in rim angle between the functional groups. A Welch's ANOVA test of the mean rim angle of different functional groups also did not find any significant differences (F [1, 8.647] = 4.403, p = 0.067), although the low p-value does suggest some differences are present. While those plates used for cooking do have a slightly smaller average rim angle compared to the serving vessels (28.3 degrees vs. 33.7 degrees), some of this variation may be the result of the low sample size of the plates used for cooking, which is only represented by three vessels. Such a small difference in means is also unlikely to be behaviorally significant, as a few degrees difference in rim angle is likely to be within the range of error that is present among hand-made vessels and might not be a clearly visible categorical difference among those using the plates. More observations are needed to conclusively determine if there is a relationship between rim angle and plate function at Larson.

Tremaine Complex

Unlike Morton Village and Larson, the non-mortuary ceramic assemblage at the Tremaine Complex is limited to jars and a few occasional variations, such as small pinchpots (O'Gorman 1993, 1994, 1995). As such, only jars were analyzed for this site.

Jars (n = 53) at the Tremaine Complex were used for a variety of tasks, which is expected since they were the only ceramic vessel type made by potters at the site (Figure 5.15). 13.2% of jars from the Tremaine Complex were used for storage or serving, while the rest were used for cooking purposes. In terms of the cooking techniques used, 32.1% of jars at the Tremaine Complex were used for wet mode cooking, 3.8% were used for dry mode cooking, 17% served as distinct multi-purpose vessels, 26.4% were used for stewing or as multi-purpose vessels, and 7.6% were used for unknown functions. Since a large number of jars were used as multi-purpose tools, that number of vessels was added to the wet and dry mode cooking vessels to get a more accurate understanding of the prevalence of those cooking techniques. After adjusting for the multi-purpose vessels, 49.1% of jars at the Tremaine Complex possessed evidence of the use of wet mode cooking techniques, while 20.7% documented the use of dry mode cooking techniques.

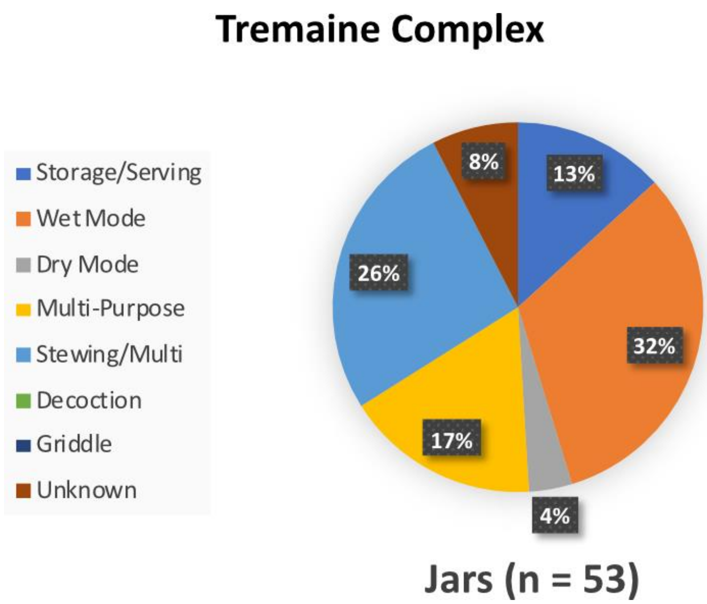

Figure 5.15. Pie chart summarizing the overall functions of jars at the Tremaine Complex.

As at the other sites, exterior sooting evidence indicates that jars at the Tremaine Complex were placed directly onto the hearth during cooking. Out of the assemblage, 66% of jars had exterior sooting on their top half, while no jars had soot only on their base and only 3.8% had sooting covering their body. The other 30.2% of jars had no evidence of exterior sooting.

Just as jar functions varied, so did the range of jar sizes present at the site. Jar rim diameter measurements (n = 40) at the Tremaine Complex ranged from 14 cm to 36 cm, and three different size groupings became apparent when observations were plotted as a histogram (Figure 5.5). These groupings are vessels with rim diameters from 14 to 17 cm, 20 to 28 cm, and 30 to 36 cm, with the largest size group containing the greatest number of vessels. In general, vessel function between the three groupings was similar, with only small variations present. Within each group, some vessels were used for storage or serving, while others were used for a variety of cooking techniques. The results of a Welch's ANOVA test further indicate that the jar size classes were not specialized in any way, as it found no significant differences (F [5, 10.456] = 1.121, $p = 0.407$) in mean rim diameter measurements among the different functional groups.

Site Level Comparisons

After examining the results of use-alteration analyses at each site individually, the results from each were then compared. Comparisons were made through both visualizations and statistical tests, and were conducted upon each vessel class (jars, bowls, plates) separately.

The first vessel type to be compared were jars, the main cooking vessels at each site. When a bar chart comparing the percentages of jar function at each site is created, it is clear that the same types of cooking techniques, as evident from ceramic use-wear, were used at each site. While they may have used the same cooking techniques, the rate at which those techniques were used vary (Figure 5.16). For example, wet mode cooking, evidence of which was present at all three sites, was used at a similar rate at Larson and Morton Village, but appears to have been a preferred cooking technique at the Tremaine Complex, where nearly double the number of jars were used for that method. At Larson and Morton Village, 16.7% and 14.9% of jars respectively were used for wet mode cooking, while at the Tremaine Complex that number increased to 32.1%. Dry mode cooking, on the other hand, shows a different pattern. Jars were used infrequently for dry mode cooking at Morton Village and the Tremaine Complex (5.3% and 3.8%), while at Larson jars were used for dry mode cooking 19.4% of the time, one of the most common techniques used at the site.

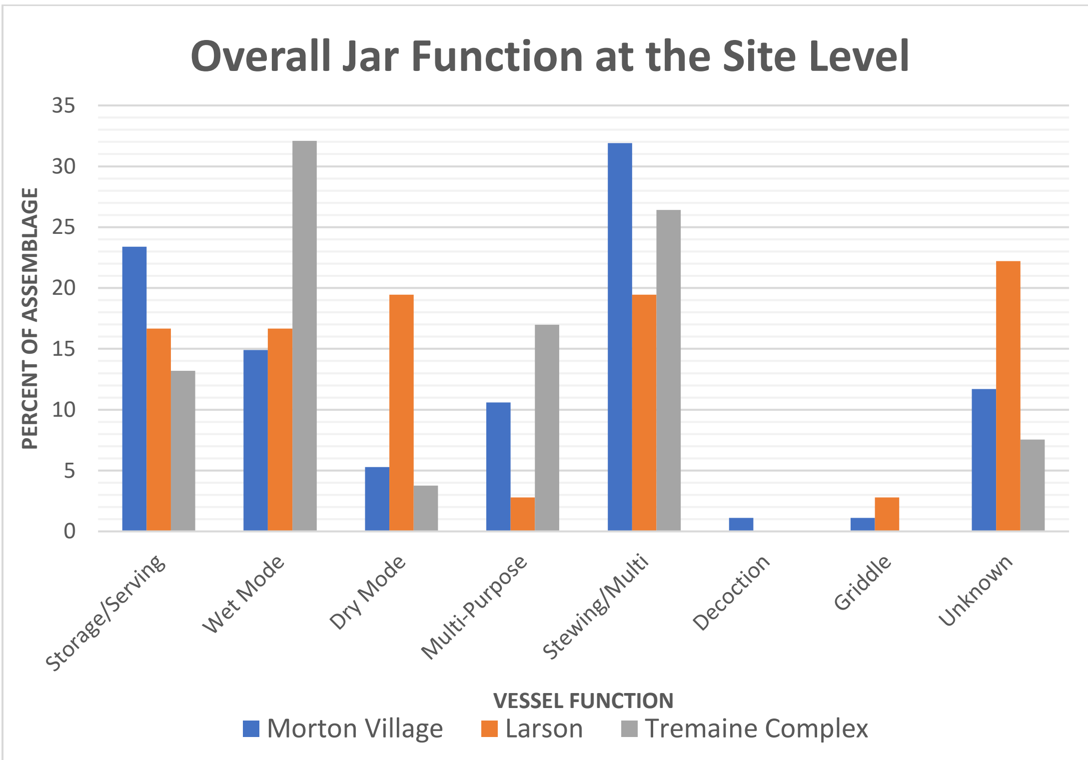

Figure 5.16. Bar chart displaying the rates of different functions among jars from the three assemblages considered at the site level.

When multi-purpose vessels are accounted for, the ratios of wet and dry mode cooking among the sites becomes less defined. At Morton Village and the Tremaine Complex, a larger percentage of jars were used as multi-purpose tools, which have evidence of use for both wet and dry mode cooking. At Larson, only a few pots were used in such a way. When the percentages of wet and dry mode pots are adjusted to account for the multi-purpose vessels, there is less of a disparity in the rates of dry mode cooking between the three sites. At Morton Village, 16% of jars bear evidence of dry mode cooking once the number of multi-purpose pots are added, while 20.7% of jars at the Tremaine Complex and 22.2% of jars at Larson were also used for dry mode cooking. Whereas dry mode cooking became more even, there is still a disparity in the rate of wet mode cooking, even when multi-purpose vessels are included. At Morton Village, 25.5% of jars after adjustment were used for wet mode cooking, while 19.4% of jars at Larson were used in the same way. At the Tremaine Complex, 49.1% of jars were used for wet mode cooking after adjusting for multi-purpose jars, still nearly twice as frequent as at the other sites. While these adjustments evened the rate of dry mode cooking between the sites, wet mode cooking at the Tremaine Complex still appears to have been preferred far more often than at the other sites. While more research is needed, this emphasis on wet mode cooking may relate to differences in foodways within multi-household longhouses at the Tremaine Complex, which may have necessitated cooking for more people at one time. If cooks were making larger amounts of food, an idea further supported by the larger jars at the Tremaine Complex, then wet mode cooking, such as making soups, may have been a more efficient way to use resources and labor to feed larger multi-family groups.

Aside from the rates of wet and dry mode cooking, comparisons of the rate of multi-purpose jars between the sites also reveal a difference in vessel use. At Larson, only one jar (2.8% of the assemblage) was used as a multi-purpose cooking utensil. At Morton Village and the Tremaine Complex, 10.6% and 17% of jars respectively were used in that way. While it cannot be definitively determined if stewing/multi-purpose carbonization patterns were created entirely by stewing or long-term multi-purpose use, Larson also has the lowest rate of jars with that carbonization pattern as well. In general, cooks at Larson appear to have preferred specialized jars that were used for just one cooking technique, while cooks at Morton Village and the Tremaine Complex commonly used the same jar for a number of cooking tasks.

Two other trends are also visible from these comparisons. While there is a small difference relative to other functional categories, it does appear that more jars at Morton Village were used for serving or storage compared to the other sites. Small jars were also used more frequently for serving or storage at Morton Village, possibly indicating a difference in serving or storage practices between the three sites. Alongside differences in the rate of serving/storage jars, Larson also has a larger percentage of jars with unknown functions, at nearly double the rate of the other sites. While this trend is difficult to account for, it may be due to the increased use of jars for dry mode cooking at Larson. Since many jars within each sample no longer possessed their base, it is possible that some jars used for dry mode cooking would have exterior sooting, but no evidence of carbonization on their interiors. This is a pattern that is very common among jars with unknown functions at Larson. It is also possible that jars were being used for a different cooking technique at Larson, which left little carbonization evidence on the jars, or that jars were being periodically cleaned of carbonized residues; however, absorbed residues would still likely be present even after being scraped clean.

When jar size classes are considered, there are very few differences. At all three sites, different sized jars were used for a variety of functions, both serving/storage and cooking, and there was no evidence of the use of certain jar sizes for a specialized function. While all jar size classes at each site were used for serving/storage, small and large jars were preferred for these functions at Morton Village, while medium and large jars were preferred at Larson. All jar sizes were used for serving/storage at similar frequencies at the Tremaine Complex.

To statistically test for significant differences in jar function between the sites, Fisher's Exact tests were completed that compared carbonization data from two sites at a time. Results are detailed in Table 5.13. Overall, results of the Fisher's Exact tests indicate that differences exist between jar function at two of the three sites. Jar function between the Tremaine Complex and Larson were found to have the most significant p-value ($p = 0.0098$), while Morton Village and Larson also may have differed significantly ($p = 0.0505$). Jar function between Morton Village and the Tremaine Complex are not significantly different at the 0.05 level, but still have a relatively low p-value ($p = 0.1353$). Based on these results, jar function at Morton Village aligns more closely with vessel use patterns at the Tremaine Complex, but there are still some major differences between the two sites, as can be seen in the Figure 5.16.

Table 5.14. Results of Site Level Jar Function Comparisons using Fisher's Exact Tests

Sites being Compared	Morton Village- Tremaine	Morton Village- Larson	Tremaine- Larson
P-Value	0.1353	0.0505	0.0098

Bowls, which are only present at Morton Village and Larson, were used as both cooking and serving/storage vessels at nearly equal rates (Figure 5.17). Unfortunately, a large number of bowls at both sites have sooting on their exteriors but no interior carbonization, making it difficult to discern how bowls were used at a greater resolution. At both Morton Village and Larson, approximately half of the bowls examined were used for serving or short-term storage. A large percentage of bowls at each site also had unknown functions, including 28.9% of bowls at Morton Village and 50% of bowls at Larson. Such high percentages of unknown functions at both sites may be due to a lack of basal sections among the bowls or their use for cooking or heating techniques that do not leave interior traces of use, such as the baking method discussed above. Only a small percentage of bowls at both sites had more specific functions. At Morton Village, 7.9% and 10.5% of bowls were used for wet and dry mode cooking respectively, while only wet mode cooking, at 5.6%, is represented at Larson.

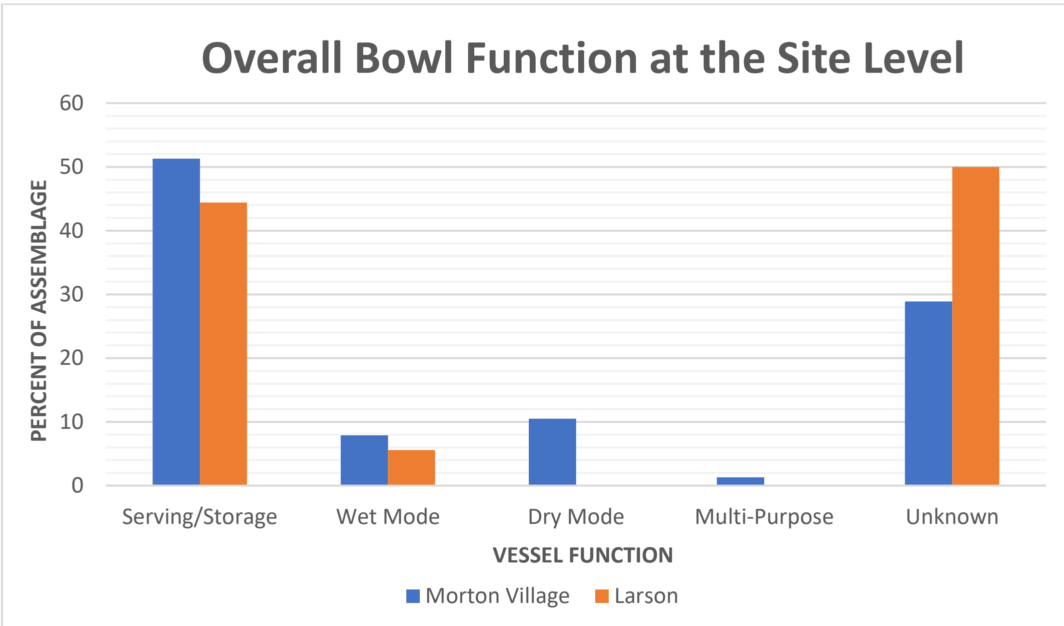

Figure 5.17. Bar chart displaying the rates of different functions among bowls from the two assemblages considered at the site level.

A Fisher's Exact test, which returned a p-value of 0.7939, further supports the argument that no significant differences in bowl function existed between the two sites. Unlike jar function, which varied between all three sites, bowls were used in generally the same way at Larson and Morton Village. Unfortunately, the condensed nature of this test, which only considered a serving/storage or cooking function, does not take into account the lack of dry mode and multi-purpose bowls at Larson or the smaller rate of bowls with an unknown function at

Morton Village. These differences may signal some small shifts in bowl use between the sites, but their significance statistically cannot be tested further.

Comparisons of bowl size classes and rim angles were more informative. At the two sites, different bowl size classes were present, although the small sample at Larson may make those size classes inaccurate. More interesting were how these size classes were used. At Morton Village, each size class was used for both serving/storage and cooking and there were no major differences present in the rates of those functions; half were used for serving/storage and half for cooking. At Larson, smaller bowls were used primarily for serving/storage, possibly as serving vessels for individuals or small groups, while larger bowls were used primarily for heating or cooking. A similar pattern was seen when rim angle was considered. At Morton Village, bowls with different shapes were generally used in a similar fashion, while different bowl shapes at Larson may have had different primary functions. There, basin-like bowls were used more frequently for serving or storage while steeper-sided bowls were used more frequently for cooking. These differences in function signal possible variations in vessel use between these two sites.

Plates, a second vessel type that is only present at Morton Village and Larson, were also used for serving/storage, but at much higher rates than among bowls (Figure 5.18). At both Morton Village and Larson, the vast majority of plates (73.3% and 81.5% respectively) were used for serving/storage, while only a small percentage were used for other purposes. Interestingly, while plates were used for serving/storage at similar rates at the two sites, they were used differently when called upon as cooking vessels. At Morton Village, plates were used almost exclusively for wet mode cooking in the few occasions they were used for food preparation, while they were used almost exclusively for dry mode cooking at Larson. Those plates with unknown functions complicate this trend though, as the higher rate of plates with unknown functions at Morton Village may be due to the use of vessels for dry mode cooking and the subsequent destruction of their bases. Despite these few incidents of cooking in plates, it is clear that their main purpose was for serving or short-term storage.

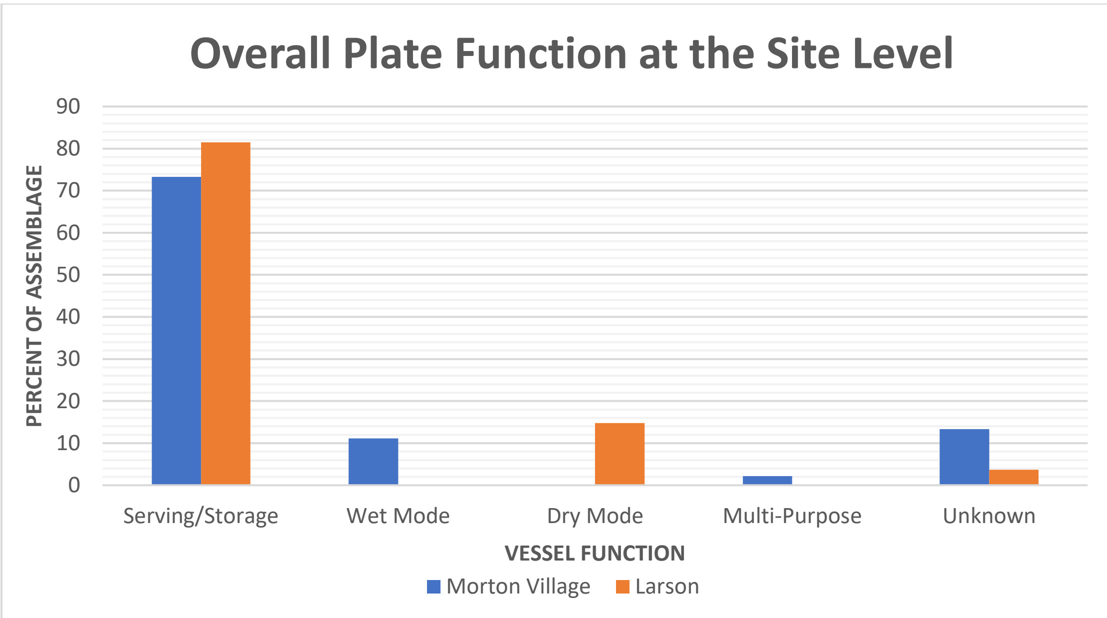

Figure 5.18. Bar chart displaying the rates of different functions among plates from the two assemblages considered at the site level.

The primary serving or storage function of plates is further supported by their design. Plates, as their name suggests, are typically large, rather flat vessels with wide open orifices that make accessing and manipulating contents easy. These vessels are also commonly highly decorated, with elaborate designs placed on the interior rim of the vessels. These decorations would have been visible by those who looked into the vessel, and would have surrounded the food or other items placed within the plate well at the center. Alongside this rim decoration, plates at both Larson and Morton Village are frequently smudged and burnished, giving them a glossy black surface finish that would have burned off if they were placed on a fire (Hally 1986). At Larson, 44.4% of the 27 plates examined were smudged and burnished, 11.1% were just burnished, and 44.4% had smoothed surfaces. At Morton Village, there are fewer smudged and burnished plates, and also a larger variety of surface treatments. Among the 45 plates examined from Morton Village, only 26.7% are smudged and burnished, while 13.3% are just burnished, 57.8% were smoothed, and 2.2% were smoothed with possible cordmarking on the base of the vessel. Given their shape, surface finishes, and highly decorated nature, past researchers have assumed these vessels functioned as serving and food presentation dishes, often used during events involving multiple families, large amounts of food, and ritual practices (Hilgeman 2000; Steponaitus 1984), which is an argument that is generally supported by the use-alteration data considered here. While it is unclear in what situations these vessels were used, plates at both sites were clearly used primarily as serving or short-term storage vessels, although use-alteration data also shows that they were co-opted for other functions as well.

Based on use-alteration data and information regarding surface treatments, there is little variation in how plates were used between Morton Village and Larson. Results of a Fisher's Exact test support this argument, finding no significant differences ($p = 0.5695$) in how plates functioned between the two sites. Unfortunately, like with the bowls, data for the plates had to be lumped into "cooking" and "serving" categories, limiting the ability of the Fisher's Exact test to detect other differences. As discussed above, how the plates were used in cooking situations may differ in major ways between the two sites, which is undetectable by the Fisher's Exact test in this case. While plates served similar functions at both sites, some minor differences in use may exist.

Variations in function are also visible when plate size and plate rim angle data are compared. While plate size data was generally similar at the two sites, the way different size groups were used vary. At Morton Village, small and medium-size plates were more frequently used for cooking while large plates were used more frequently for serving. At Larson, this pattern shifts, as small plates were used more frequently for serving and medium and large-sized plates were used more frequently for cooking. Variations in the relationship between rim angle and plate function also existed between the sites. At Larson, rim angle data plotted as a unimodal distribution and no major variations in function were found, despite some indications that plates with smaller and larger rim angles may have been used differently. Morton Village rim angle data demonstrated that two rim angle groupings were present, and that the two groups may have been used differently. At Morton Village, more bowl-like plates appear to have been used more frequently as cooking and food preparation vessels, while those with a more plate-like profile were used more frequently for serving. Plates at both sites may have functioned primarily as serving vessels, yet some variations in design and function do exist and may signal real differences in cooking and serving practices between the two sites.

Summary of Site Level Use-Alteration Analyses

Analyses of use-alteration data of jars, bowls, and plates at the site level, conducted to address Research Question 1, have revealed some clear differences in vessel use, cooking, and consumption patterns between the three sites. Jars, the main cooking vessels at each site, possessed the most variation in function. Data demonstrates that Larson and Tremaine had the most divergent practices, with cooks at the Tremaine Complex preferring wet mode cooking and flexible pattern of vessel use and cooks at Larson possibly preferring dry mode cooking and a more specialized use of vessels. Morton Village, while different from both of the comparative sites, is closer to the Tremaine Complex in terms of jar use. While Morton Village is more similar to the Tremaine Complex when considering jar use, the presence of bowls and plates at the site matches more closely with Larson. Although variations in bowl and plate function are present, in general both sites used bowls equally for cooking and serving/storage vessels and used plates primarily as serving vessels. Differences that do exist in plate and bowl function relate to how those vessels were used for cooking, with different emphases present at Morton Village and Larson. Bowl and plate size classes and rim angle groupings also appear to have been used differently between the two sites. Overall, vessel use patterns varied at each site, indicating that residents at Morton Village did not strictly adhere to the vessel use patterns seen among the Oneota or the Mississippian comparative sites, but may have been developing their own preferred practices.

Summary

Above, I have presented the results of morphological and site level use-alteration analyses of ceramics from Morton Village, Larson, and the Tremaine Complex that were conducted to address Research Question 1. In both analyses, variations were found which indicate that both similarities and differences in cooking and foodways patterns were present at all three sites. These differences indicate that residents of Morton Village were not relying completely on foodways patterns seen at the comparative sites, but may have been adapting their foodways patterns to fit their needs, leading to new or different practices and traditions that may have played an important social role within the site. In the next chapter, Chapter 6, vessel use patterns will be explored further as I summarize the results of intra-site level ceramic use-alteration analyses at Morton Village, which explore variations in practices within the site.

CHAPTER 6:

RESULTS OF INTRA-SITE LEVEL CERAMIC USE-ALTERATION ANALYSIS

In this chapter, I present the results of intra-site ceramic use-alteration analyses performed to address Research Question 2. This research question seeks to investigate if there is evidence for the use of different cooking and foodways practices among the residents of Morton Village, using ceramic style as a proxy for social identity. These data are then compared to use-alteration data from Larson and the Tremaine Complex to detect if the migrant and local residents of Morton Village were continuing traditional foodways practices or changing them. For this analysis, the Morton Village assemblage was split into Oneota- and Mississippian-style ceramics to facilitate comparisons of vessel function within the Morton Village site. This division was completed as vessel style is a major dimension of artifact variability at the site and may be related to regional archaeological cultures and the cultural affiliation of the inhabitants; therefore, it may allow me to detect similarities and differences in foodways traditions between migrant and local inhabitants at Morton Village. The same methods as used in Chapter 5 were used to analyze the use-alteration data within these two sub-assemblages, and secondary comparisons were made to Larson and the Tremaine Complex using the same data from those sites as was used in the previous chapter.

Intra-Site Level Analysis of Use-Alteration

Oneota- and Mississippian-Style Vessel Use-Wear at Morton Village

When the Morton Village sample was split by style, a total of 59 vessels were Mississippian-style (19 jars, nine bowls, and 31 plates) and 107 vessels were Oneota-style (68 jars, 28 bowls, and 11 plates). As discussed in Chapter 4, there is a clear bias towards Oneota-style vessels, which are represented by nearly twice as many vessels.

Mississippian-style jars at Morton Village were used for a number of functions (Figure 6.1), with the most common carbonization pattern being stewing/multi-purpose (47.4%). Other ways Mississippian-style jars were used include wet mode cooking (15.8%), dry mode cooking (10.5%), storage/serving (21.1%), and unknown (5.3%). No individual Mississippian-style jars were used for multi-purpose cooking. As such, no calculations were required to adjust the rates of wet and dry mode cooking techniques among this assemblage.

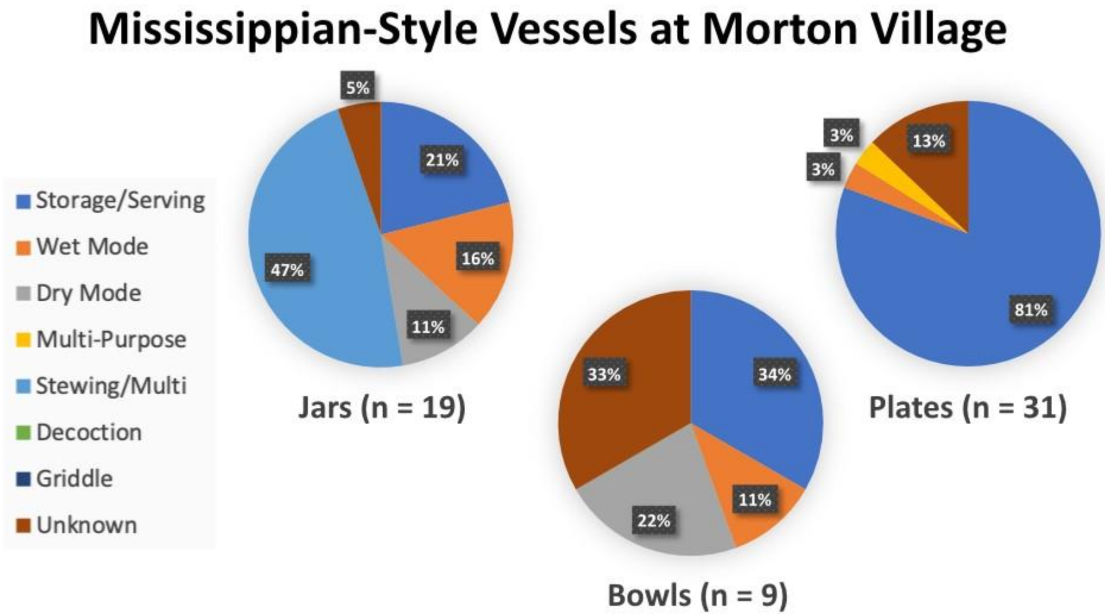

Figure 6.1. Pie charts summarizing the overall functions of Mississippian-style jars, bowls, and plates at Morton Village.

As among other assemblages, exterior sooting, when present, was predominantly located on the top half of Mississippian-style jars. In total, 57.9% of jars had sooting on their top half only, 10.5% had sooting all over the vessel body, 5.3% had an amorphous sooting pattern, and 26.3% of jars had no exterior soot present. Based on this data, it is clear that Mississippian-style jars were primarily placed directly onto a hearth when used for cooking.

While a wide variety of rim diameter measurements are present among Mississippian-style jars, the small sample size of this group makes distinguishing vessel size classes difficult. When plotted as a histogram (Figure 5.5), rim diameter observations fall into two groups, one with rim diameters ranging from 15 to 21 cm and another with a range of 26 to 32 cm. While the results of a Welch's ANOVA test indicate that there are no significant differences (F [2, 4.709] = 1.540, p = 0.306) in the mean diameter of different functional groups, some differences are visible when the rates of different functional groups are examined. Among these two groups, dry mode cooking only appears within the smaller size group. It also appears that only larger jars were used for serving or storage, as not a single vessel from the smaller group was used for such purposes. Instead, all of the smaller jars were used for cooking or food processing in some way.

Like jars, Mississippian-style bowls were also used for a variety of functions (Figure 6.1). While the sample size is small, only 9 bowls, it is clear that they were used for both storage/serving and cooking purposes. 33.3% of Mississippian-style bowls were used for storage or serving, while 11.1% of bowls were used for wet mode cooking, 22.2% were used for dry mode cooking, and 33.3% were used for unknown purposes. Again, no individual bowls were used as multi-purpose tools. Exterior sooting, when present, was found entirely on the top half of bowls and not on the base, indicating that they were placed directly on the hearth when used for cooking.

Unfortunately, the small sample size for Mississippian-style bowls makes generating inferences about the function of different vessel classes difficult. Only six Mississippian-style bowls had large enough rims to measure their rim diameter, with five of the six having rim diameters between 32 and 42 cm. One bowl had a much smaller rim diameter, 8 cm, indicating that smaller Mississippian-style bowls were also made. Both the smallest (8 cm) and the largest (42 cm) were used for storage or serving, while all of the other bowls were used for a variety of cooking techniques. As only one smaller bowl was present, I am unable to determine if there were any significant differences in how the vessel size classes were used. Further, a Welch's ANOVA test was not performed on this data, as too many of the functional classes are represented by only one rim diameter measurement. More data will be needed in the future to better assess the roles played by different sized Mississippian-style bowls at Morton Village.

Rim angle data for Mississippian-style bowls is also relatively homogeneous, with a small sample size of five measurements ranging from 75 to 85 degrees. As such, no evidence of different shaped bowls is present, but a larger sample of bowls may uncover evidence for more variation.

Unlike jars and bowls, large sections of Mississippian-style plates were more abundant at Morton Village, with a sample size of 31. Mississippian-style plates, like the plate data examined in the site level analysis, were used primarily as serving or storage vessels, with 80.6% of the plates filling that role (Figure 6.1). Only 3.2% of the Mississippian-style plates at Morton Village were used for wet mode cooking, 3.2% likely served as a multi-purpose tool, and 12.9% were used in unknown ways. Exterior sooting data further corroborates the argument that these plates were primarily serving or storage vessels, as 90.3% of Mississippian-style plates had no evidence of soot on their exteriors. Those few that did only had soot on their top halves (6.5%) or all over the vessel body (3.2%).

Of the 31 Mississippian-style plates analyzed from Morton Village, 17 had rims large enough to collect rim diameter measurements. When plotted as a histogram (Figure 5.7), these measurements vary widely but form a rough unimodal distribution, indicating that there was one primary size range in which plates were made, with rim diameters ranging from 26 to 38 cm, alongside both smaller and larger outliers. In general, all plate sizes appear to have been used in the same manner, as around 80% of plates in each size group were used for serving or storage. A Welch's ANOVA test further supports this argument, as it found that there were no significant differences present (F [1, 2.353] = 0.033, p = 0.871) among the mean rim diameter of different functional groups.

Interestingly, plate rim angle measurements indicated more variation in relation to vessel function than among plate rim diameters. Overall, Mississippian-style plate rim angles varied widely at Morton Village, ranging from 15 to 75 degrees. Plotted into a histogram (Figure 5.8), plate rim angle observations formed a bimodal distribution, with peaks at 25 to 30 degrees (more plate-like) and 40 to 45 degrees (more bowl-like). When the rim angle measurements were broken into two groups, those with rim angles of less than 40 degrees and those with rim angles of 40 degrees or greater, some differences in function were apparent. Those plates that were more plate-like, with rim angles below 40 degrees, were used almost exclusively for serving or storage, as 87.5% had no sooting or carbonization evidence. Those plates that were more bowl-like, with rim angles of 40 degrees or greater, were only used as serving or storage vessels 44.4% of the time, while 55.6% were used for cooking and food processing. While differences in function are visible when descriptive statistics are examined, a Welch's ANOVA test found that no significant differences (F [1, 5.209] = 2.306, p = 0.187) exist in mean rim angle measurements among the different functional groups. This lack of significance may be due to the low sample numbers of many of the different functional classes, which could skew the results of the Welch's ANOVA. As a secondary test, functional groups for Mississippian-style plates were collapsed into serving/storage and cooking categories, and a Welch's T-Test was performed to see if any differences in rim angle among these two groups existed. The Welch's T-Test returned a p-value of 0.11 (t [12.082] = -1.725), still indicating that there are no significant differences in mean rim angle between the two functional groups. While not greatly significant, such a low p-value does suggest that differences between the two groups may be meaningful and it could be that bowl-like and plate-like Mississippian-style plates functioned differently at Morton Village.

Oneota-style jars at Morton Village, like their Mississippian-style counterparts, were used in a wide variety of ways (Figure 6.2). The most common function they served was as a stewing/multi-purpose vessel, with 30.9% of the assemblage used in this manner. Alongside stewing/multi-purpose cooking, 16.2% of Oneota-style jars were used for wet mode cooking, 4.4% were used for dry mode cooking, 13.2% served as multi-purpose tools, 1.5% were re-used as griddles, 1.5% may have been used for decoction, and 11.8% of jars were used in unknown ways. When rates of different cooking types are adjusted to account for the multi-purpose jars, 29.4% of Oneota-style jars at Morton Village were used for wet mode cooking, while 17.7% were used for dry mode cooking.

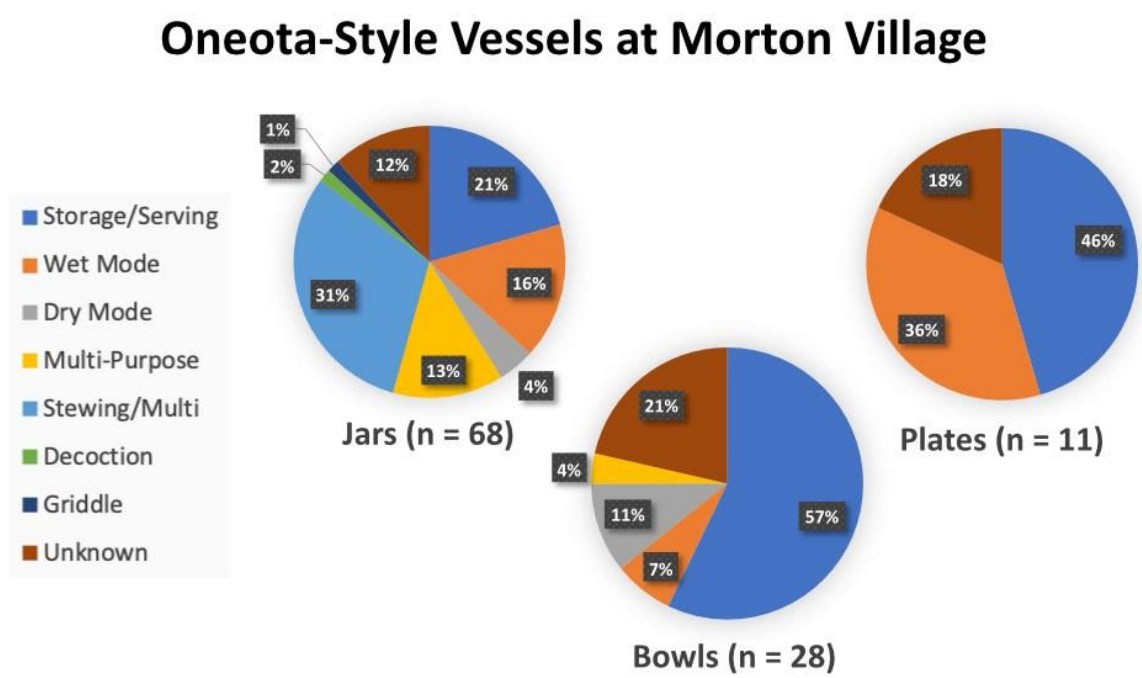

Figure 6.2. Pie charts summarizing the overall functions of Oneota-style jars, bowls, and plates at Morton Village.

As has been the pattern with every other assemblage considered, exterior sooting on Oneota-style vessels predominantly appears on the upper half of the vessels, indicating their placement directly on a hearth when used for cooking. Among the Oneota-style jars, 66.2% had sooting only on their top halves, while only 5.9% had sooting on their base, 2.9% had sooting all over, and 25% had no sooting.

Jar size classes among the Oneota-style jars from Morton village are more complex, likely due to the larger sample size present. When rim diameter measurements were plotted as a histogram (Figure 5.5), a multi-modal distribution was formed, with a number of peaks and troughs among the data. While some groupings are less clear, it appears that at least five different size classes were present: extra-small (rim diameter of 6 cm), small (rim diameters from 10 to 18 cm), medium (rim diameters from 21 to 24 cm), large (rim diameters from 26 to 32 cm), and extra-large (rim diameters from 34 to 38 cm). Jar function varied among these five size classes, yet no major differences are apparent. This argument is further supported by a Welch's ANOVA test, which found no significant differences (F [5, 8.094] = 0.253, $p = 0.928$) were present between the mean rim diameter of different functional classes. While no major differences are apparent, there are some small variations that are worth noting. In general, small, large, and extra-large jars were used for storage or serving, but medium jars were not; instead, medium jars were used entirely for cooking. It is possible that small jars may have been used as serving vessels since they would have been less efficient as storage devices, while larger jars were used for storage and medium vessels functioned as the primary cooking vessel. It is also apparent that wet mode cooking was more prevalent in larger vessels (13% of small jars compared to 27.3%, 31.3%, and 25% of medium, large, and extra-large jars respectively), possibly due to the amount of liquid needed to cook appropriate amounts of food.

Oneota-style bowls, like jars, were used for a variety of purposes, including serving/storage and cooking (Figure 6.2). 57.1% of bowls were used for serving or storage, while

7.1% were used for wet mode cooking, 10.7% for dry mode cooking, 3.6% for multi-purpose use, and 21.4% for unknown uses. When numbers are adjusted to account for multi-purpose bowls, 10.7% were used for wet mode cooking and 14.3% were used for dry mode cooking. In terms of exterior sooting, 64.3% of bowls did not possess evidence of sooting, while 28.6% had sooting on their top half only, 3.6% had sooting all over the vessel body, and 3.6% had amorphous sooting patterns. Overall, Oneota-style bowls were used about half the time for serving or storage and half the time for cooking. When they were used for cooking, they tended to be placed directly on the hearth.

Rim diameter measurements on Oneota-style bowls, when plotted into a histogram, form a multi-modal distribution with four main size classes (Figure 5.6). These size classes include small bowls with rim diameters ranging from 14 to 17 cm, medium bowls ranging from 20 to 24 cm, large bowls ranging from 26 to 32 cm, and extra-large bowls ranging from 36 to 50 cm. Despite this variation in bowl size, all size classes were generally used for a variety of functions, including both serving/storage and cooking. A Welch's ANOVA test also supports the generalized use of different bowl sizes, as it found no significant differences (F [2, 4.602] = 0.009, $p = 0.991$) between the mean rim diameters of the functional groups. While it may be due to sampling bias, it is interesting to note that wet mode cooking is only present in large bowls, while the other sizes were used for dry mode cooking.

Some variation in rim angle measurements are also present among Oneota-style bowls, suggesting both basin-like and steep-sided bowls were used. Rim angles (n = 22) ranged from 40 to 90 degrees, with most possessing rim angles of 70 degrees or more, but three bowls did have rim angles of 55 degrees or less and may have had a basin-like shape. While it is possible that two different bowl shapes were present, bowl function did not vary greatly when the sample was divided into bowls with rim angles greater than or less than 55 degrees. In both groups, a small majority of bowls were used for serving or storage (57.9% and 66.7% respectively), while other bowls were used for cooking or heating foods.

Unfortunately, Oneota-style plates are represented by a smaller sample size (n =11) than jars and bowls, limiting the analysis of size and rim angle classes. Overall, Oneota-style plates at Morton Village were used similar to bowls, with about half used for serving and half used for cooking (Figure 6.2). 45.5% of Oneota-style plates had no carbonization and sooting, indicating they were used for serving or storage, while 36.4% were used for wet mode cooking and 18.2% had unknown functions. Data is similar for exterior sooting, as 45.5% possessed no evidence of soot, 45.5% had soot only on the top half of the body, and 9.1% had sooting all over the vessel body. These data further suggest that about half of the Oneota-style plates were used for serving/storage and half for cooking, with plates used for cooking placed directly onto the hearth.

As only seven Oneota-style plates possessed large enough rims to collect rim diameter measurements, size classes among Oneota-style plates are harder to differentiate. When plotted as a histogram (Figure 5.7), three clear groupings are present, a smaller group with rim diameters of 23 and 25 cm, a medium group with diameters ranging from 30 to 31 cm, and a large group with diameters of 36 and 40 cm. When the function of these three size groupings are compared, some clear differences emerge. The small grouping of Oneota-style plates was used entirely for wet mode cooking, 66.7% of the medium grouping was used for wet mode cooking and 33.3% for serving, and the large group was entirely used for serving. This pattern suggests that among Oneota-style plates the smaller vessels were used primarily for cooking and larger vessels were used primarily for serving. As only two functional groups are represented within the rim diameter data, a Welch's T-Test was performed to see if significant differences existed in the mean rim diameter measurements between the two groups. This test returned a p-value of 0.087 (t [3.678] = 2.317) that, while not significant at the 0.05 level, does indicate that clear differences existed in how different sized Oneota-style plates were used. It must be remembered that only seven plates were available for this analysis, so any patterns will need to be tested further to confirm their validity.

Rim angle data among Oneota-style plates did not vary as much as among the rim diameter data. Overall, plate rim angles ranged from 25 to 55 degrees, forming a distribution skewed toward the left or higher angle (Figure 5.8). Most rim angle measurements center around 50 to 55 degrees, creating a more bowl-like shape, while one vessel had a rim angle of 25 degrees and a more plate-like form. As such, there is primarily only one rim angle group, with a smaller outlier also present. When the functions of these plates were examined, there are no differences in how plates with different rim angles were used. A Welch's T-Test further supports this result, finding no significant difference (t [2.697] = 0.247, p = 0.822) in the mean rim angle between the wet mode and serving functional groups. While vessel size may have been an important factor in how Oneota-style plates were used, it appears that rim angle did not play such a role.

Intra-Site Level Comparisons

After the completion of functional analyses within individual assemblages, the assemblages were then compared. As among the site level analyses, comparisons were performed using both descriptive statistics and simple statistical tests, and were performed on each vessel class individually.

Jar function among the four assemblages considered in this part of the analysis indicate both similarities and differences in vessel use patterns existed (Figure 6.3). Within all four assemblages, jars were used for storage and serving at a similar rate, generally around 15% to 20%. Aside from storage and serving, the preferred cooking techniques often varied among the different assemblages. At the Tremaine Complex, the rate of wet mode cooking was nearly twice as high as among the other assemblages, while strictly dry mode cooking was most prevalent within the Larson and Mississippian-style Morton Village assemblages. When multi-purpose jars, which appear more frequently among the Tremaine Complex and Oneota-style Morton Village jars, are accounted for, the rate of the dry mode cooking is more even between the four assemblages, while the Tremaine Complex still has the highest rate of wet mode cooking. In this case, the main difference in function is the tendency to use jars for more than one purpose, which is uncommon or non-existent in the Larson and Mississippian-style Morton Village jars but is common among the Tremaine Complex and Oneota-style Morton assemblages. One other unique variation is the high rate of stewing/multi-purpose jars within the Mississippian-style Morton Village assemblage, which is higher than any other group of jars considered here.

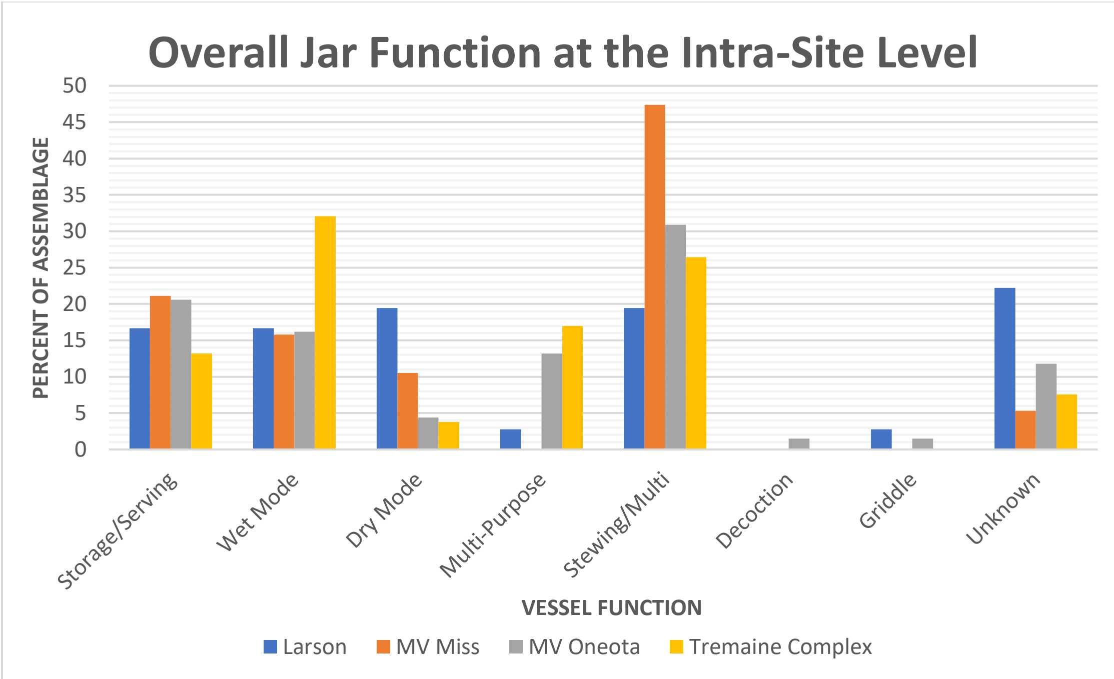

Figure 6.3. Bar chart displaying the rates of different functions among jars from the four assemblages considered at the intra-site level.

In general, there are few differences in how different sized jars were used among these assemblages. As jars of all sizes were used in a variety of ways, including serving/storage and different cooking techniques, it is unlikely that size specialization occurred at any of the sites considered here. Despite these general similarities, one difference in serving/storage jars is possible. Within the Oneota-style jar assemblage from Morton Village, small and large jars commonly are used for serving/storage. While storage and serving functions are difficult to differentiate only through use-wear patterns, based on their size it is possible that larger jars were used for storage while smaller jars were used as individual serving vessels. This pattern is not present at Larson or in the Mississippian-style Morton Village jar assemblage, in which large jars are the primary storage/serving vessels and small jars are primarily used for cooking. While this may be an issue of smaller sample sizes among the Mississippian-style jars, this may also signal a difference in serving and storage patterns.

To test the significance of differences in jar function, multiple Fisher's Exact tests were performed that compare two of the intra-site assemblages at a time (for the results, see Table 6.1). Results indicate that the two sub-assemblages of Morton Village jars did not possess significantly different functions, despite some variations in rates of use. Assemblages from the same stylistic tradition, for example Larson and Mississippian-style jars from Morton Village, also were not significantly different, suggesting some continuity in cooking and vessel use traditions may have been present at Morton Village. Only cross-tradition comparisons, for example Oneota-style jars from Morton Village compared to Mississippian jars at Larson, returned results that indicate significant differences in jar function were present.

Table 6.1. Results of Intra-Site Level Jar Function Comparisons using Fisher's Exact Tests

Sites Being Compared	**P-Value**
MV Mississippian- MV Oneota	0.3943
MV Mississippian- Larson	0.2462
MV Mississippian- Tremaine Complex	0.1013
MV Oneota- Larson	0.05386
MV Oneota- Tremaine Complex	0.4016

Overall, it appears that jar function at Morton Village was relatively similar across stylistic traditions. However, the ways Mississippian- and Oneota-style vessels were used also indicate the presence of individualistic traits that may correlate to larger Oneota or Mississippian traditions of cooking and vessel use. The clearest example of this is the use of jars as clear multi-purpose cooking utensils among the Oneota-style vessels from the Tremaine Complex and

Morton Village, but not among Mississippian-style jars from Larson and Morton Village. This pattern suggests that Oneota cooks may participate in a tradition of flexible vessel use, while Mississippian cooks choose to use ceramics in a more specialized manner. As jars are often the only vessel type commonly found on Oneota Tradition sites (Hall 1962; Harvey 1979; O'Gorman 1995; Straffin 1971), it may have been necessary to use the same vessel for a number of cooking and household tasks, helping to explain this common practice of using vessels as multi-purpose tools. At Mississippian Tradition sites, a more varied assemblage of ceramic types is often present (Boudreaux 2010; Hanenberger 2003; O'Brien 1972; Wilson and Rodning 2002), enabling a more specialized pattern of vessel use. The continuation of these patterns at Morton Village may suggest that some traditional vessel use behaviors were still present at the site. Unfortunately, it is unclear how stewing/multi-purpose jars fit within these patterns, as I am unable to discern if these vessels were only used for stewing or if they were used for multiple cooking techniques as well.

Other data, such as the reduced rate of wet mode cooking among Oneota-style jars at Morton Village or the far greater rate of stewing/multi-purpose within Mississippian-style jars, go against trends at the comparative sites and indicate that some changes in vessel use were also taking place at Morton Village. Instead of clear matches between Morton Village and the two comparative sites, jar function indicates that similarities and differences, continuity and change, are both present at Morton Village. This suggests that hybridization in cooking traditions may have been occurring at Morton Village as the different groups learned from each other and began to develop new taste preferences.

Comparisons of bowl function are less telling. Generally, bowls among the three assemblages examined here (Larson, Mississippian- and Oneota-style sub-assemblages from

Morton Village) were used in similar ways, with about half of the bowls used for cooking and the other half used for storage or serving (Figure 6.4). Some slight differences in bowl function are present at Morton Village, where only 33.3% of Mississippian-style bowls were used for storage or serving compared to 57.1% of Oneota-style bowls. Based on these numbers, it appears that a majority of Mississippian-style bowls were used for cooking while a majority of Oneota-style bowls were used for serving or storage. Bowls among both sub-assemblages at Morton Village were also used for dry mode cooking, while not one bowl from Larson was used for such purposes, although some bowls used for dry mode cooking may have lost their base and been categorized as a vessel with an unknown function. Unfortunately, a large percentage of bowls from each assemblage have unknown functions, limiting my ability to better detect how bowls were used. Such a large percentage of bowls with soot on their exterior but no interior carbonization suggest that bowls may have been used as covers or ovens for baking food items, or that they were used for other unknown cooking and processing techniques that are not well understood. While information about bowl function is limited and appears similar among the sites, it is important to reiterate that bowls are not present at the Tremaine Complex (O'Gorman 1993, 1994, 1995), marking a clear difference in cooking and foodways behaviors between Morton Village, Larson, and the Tremaine Complex.

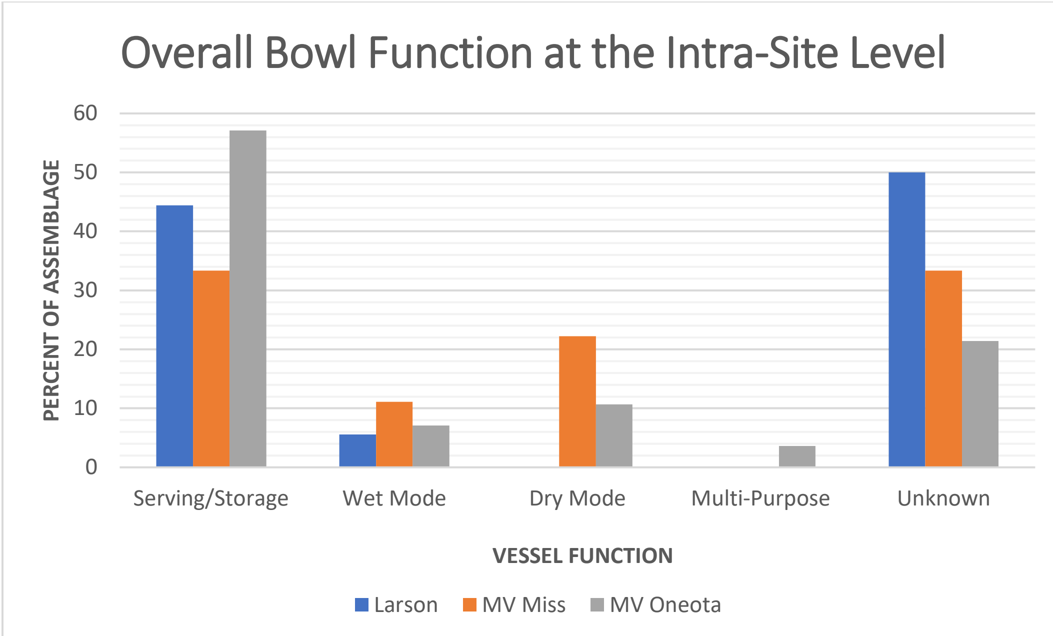

Figure 6.4. Bar chart displaying the rates of different functions among bowls from the three assemblages considered at the intra-site level.

The general similarity in bowl function between the three assemblages is further supported by the results of Fisher's Exact tests. To avoid sample size restrictions during these tests, functional categories were collapsed into "cooking" and "serving/storage" categories. Once calculated, the Fisher's Exact tests indicate that there were no significant differences in bowl function among any of the assemblages (Table 6.2). While the lumping of data during this test loses some information, it further indicates that there are few differences in bowl function between the three assemblages.

Table 6.2. Results of Intra-Site Level Bowl Function Comparisons using Fisher's Exact Tests	
Sites Being Compared	**P-Value**
MV Mississippian- MV Oneota	0.2691
MV Mississippian- Larson	0.6924
MV Oneota- Larson	0.5468

While overall bowl function was similar between the assemblages, the function of different bowl size classes did differ. At Morton Village, different sizes of both Mississippian- and Oneota-style bowls were used in the same way, generally each size class was used about half the time for cooking and half the time for serving or storage. At Larson, bowl function varied between different size classes. Smaller bowls at Larson were used primarily for serving or storage (80% of small bowls), while large bowls were used primarily for cooking (75% of large bowls).

There were also some variations in bowl shape between the assemblages. While small sample sizes likely contribute to this pattern, only steep-sided bowls were present among the Mississippian-style vessels from Morton Village while a wider variety of bowl shapes were present among the other two, larger assemblages. How these differently shaped bowls were used also appears to vary. Basin-shaped and steep-sided Oneota-style bowls from Morton Village were generally used in the same way, with a little more than half used for serving or storage and the rest used for cooking. At Larson, basin-shaped bowls were more commonly used as serving or storage vessels while steep-sided bowls were used more commonly for cooking. These differences in the use of various shapes and sizes of bowls may indicate that while bowl function was generally similar, there may have been differences in the serving/storage practices between the two sites.

Evidence for different vessel function practices is also apparent among plates, whose function varied between the assemblages (Figure 6.5). Within the Larson and Mississippian-style Morton Village assemblages, plates were primarily serving vessels, as about 80% had no evidence of sooting or carbonization. Oneota-style plates from Morton Village, on the other hand, were used as multi-purpose vessels like bowls, with about half of the plates used as serving vessels (45.5%) and the other half used for cooking or heating up food (54.6%). These differences signal a clear difference in how plates were used, one that is supported by the results of Fisher's Exact tests (Table 6.3). Like with bowls, functional categories were lumped into "cooking" and "serving" categories and the results were then calculated. Fisher's Exact tests indicate that there was no significant difference in plate function between Larson and Mississippian-style plates from Morton Village, but that those two assemblages did differ significantly from the function of Oneota-style plates from Morton Village.

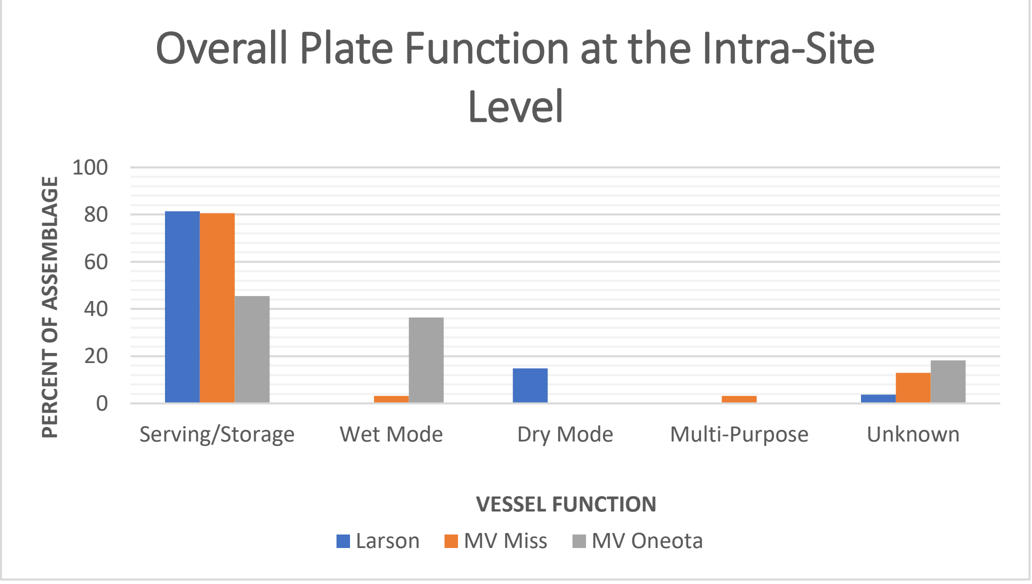

Figure 6.5. Bar chart displaying the rates of different functions among plates from the three assemblages considered at the intra-site level.

Table 6.3. Results of Intra-Site Level Plate Function Comparisons using Fisher's Exact Tests	
Sites Being Compared	**P-Value**
MV Mississippian- MV Oneota	0.04909
MV Mississippian- Larson	1.0
MV Oneota- Larson	0.04706

Data regarding the smudging of plates also varies between the sites and may suggest that differences in function were considered during the production process. Smudging, the addition of a layer of carbon on the surfaces of a vessel during the firing process, is a clear signal of the intended function of a vessel, as exposure to fire will burn off this carbon layer and destroy the effects of this firing process (Hally 1986). Because of this, it is unlikely that potters would intentionally smudge vessels intended for cooking. Instead, vessels intended to be serving or storage vessels were more likely to be smudged. Among the assemblages examined here, smudged surfaces were common on plates from Larson and on Mississippian-style plates from Morton Village. At Larson, 44.4% of plates analyzed for this study had smudged surfaces, while 35.5% of Mississippian-style plates from Morton Village were smudged. Unlike the Mississippian-style assemblages, only one Oneota-style plate from Morton Village (9.1% of analyzed plates) was smudged. These numbers suggest that Mississippian-style plates at Larson and Morton Village were produced as serving vessels, while the potters who made Oneota-style plates at Morton Village may have intended to use their plates for more than just serving and displaying food.

Aside from differences in the ratio of serving versus cooking vessels, one other small difference in plate function is visible. At Larson, when plates were used for cooking or heating, the dry mode technique was used. No Larson plates were used for wet mode cooking. Plates from Morton Village have the opposite pattern, where plates were used exclusively for wet mode and not dry mode cooking. The opposite pattern was seen among bowls, where bowls from Larson were used primarily for wet mode cooking and bowls from Morton Village were more focused on dry mode cooking. While these patterns could be impacted by small sample sizes, it is possible that plates and bowls were used for opposite cooking techniques between the two sites.

Some further variations in plate function were present when size and rim angle data were examined in relation to function. In terms of plate size classes, plates of all sizes were used primarily for serving within the Larson and Mississippian-style Morton Village assemblages. Among the Oneota-style plates from Morton Village, which is hampered by a small sample size, smaller sized plates were primarily used for cooking and larger plates for serving. While many of the variations in plate function have been between the different stylistic groups (Mississippian versus Oneota), variations in the relationship between rim angle and plate function occur among the Mississippian-style plates. Within the Larson and Oneota-style plates from Morton Village, rim angle data is unimodally distributed and there are no variations in how differently shaped plates were used. Mississippian-style plates from Morton Village, on the other hand, have two different rim angle groupings, one that is more plate-like and one that is more bowl-like. The more plate-like vessels tend to be used for serving, while the more bowl-like plates are used for cooking.

Overall, major variations in plate function are present between the sites, primarily between the Oneota-style and Mississippian-style plates. It is also important to note that the plate vessel form does not appear at the Tremaine Complex or many other Oneota sites (Hall 1962; Harvey 1979; O'Gorman 1995; Straffin 1971), clearly indicating that the creation of Oneota-style plates itself is a major difference in vessel use patterns. These differences may represent variations in past cooking and serving traditions that were brought to Morton Village, specifically the use of plates as serving vessels among the Mississippian Tradition and the use of ceramic vessels as multi-purpose tools among the Oneota Tradition. While these differences exist, the adoption and use of Oneota-style plates may represent a significant change in serving and vessel practices as well, with Oneota potters and cooks adopting a new vessel form and using it within a Mississippian framework, at least part of the time. As with the jars, use-alteration data among plates indicates that hybridization of vessel use patterns was on-going at Morton Village, as migrant potters adopted new vessel forms and practices but also sought to fit these vessels into previous traditions of vessel use.

Summary of Intra-Site Level Use-Alteration Analyses

The goal of Research Question 2 was to uncover any differences in cooking and serving practices between different styles of ceramics at Morton Village and to see how these vessel use patterns compare to Larson and the Tremaine Complex. By comparing this information, I sought to uncover evidence of the alteration or maintenance of past cooking and vessel use traditions, which would indicate if hybridization in practices was occurring or not. Through use-alteration data, some clear differences in vessel function between Oneota-style and Mississippian-style ceramics at Morton Village have been revealed. While bowl function is largely similar, jars possessed some subtle differences in what cooking techniques were emphasized. Mississippian-style and Oneota-style jars also appear to have been used in two different overall traditions, with an emphasis on multi-functional uses in Oneota-style jars and an emphasis on specialized uses among the Mississippian-style jars. Plate function was also widely different at Morton Village, with Mississippian-style plates primarily used for serving while Oneota-style plates were used equally for both serving and cooking.

These patterns at Morton Village both align with and diverge from vessel function at the comparative sites in interesting ways. For example, Mississippian-style jars match Larson in their emphasis on specialized vessel function, while Oneota-style jars match the Tremaine Complex in their emphasis on using jars as multi-purpose tools. Mississippian-style plates from Morton Village also match perfectly with plate function at Larson, while Oneota-style plates at Morton Village were used in a more multi-functional pattern typical of Oneota Tradition sites like the Tremaine Complex. Despite these similarities, differences were also apparent. Oneota-style jars tend to focus on wet mode cooking at the same rate as the Mississippian-style assemblages, instead of the heavy emphasis on wet mode cooking seen at the Tremaine Complex. Mississippian-style jars from Morton Village appear to emphasize stewing/multi-purpose cooking much more than every other assemblage considered here. The adoption and use of bowls and plates by Oneota potters and cooks is also a major divergence from the patterns seen at the Tremaine Complex, where only jars are used. Instead, the presence of Oneota-style bowls and plates are more in line with the local Mississippian tradition of vessel use in the CIRV. Interestingly, while the use of bowls and plates is a Mississippian trait, the way the Oneota-style bowl and plate functional patterns emphasized the multi-functional use of vessels is similar to vessel use patterns seen at the Tremaine Complex. Overall, a complex mix of continuity and change in cooking, serving, and vessel use patterns is apparent at Morton Village. This mix of continuity and change indicates that hybridization of tastes and practices was occurring at the site, but that it had not yet completely changed the traditions of those living at Morton Village. As hybridization occurred, shifts in cooking and vessel use patterns may have led to shared foodways practices between residents at Morton Village, helping the migrants and locals to coalesce into one community.

Summary

In this chapter, I have presented the results of morphological and use-alteration analyses of ceramics that were conducted to address Research Questions 2. These results indicate that complex patterns of vessel use were present at Morton Village. In general, differences in vessel function exist between the Oneota-style and Mississippian-style sub-samples from Morton Village, as well as between the Morton Village sub-samples and the comparative sites. While differences are present, there are also similarities in function between Morton Village and the comparative sites that may relate to past traditions of cooking and vessel use. When all of this information is examined, it appears that both continuity and change in cooking, serving, and vessel use practices occurred at Morton Village, suggesting that hybridization of practices was on-going. This hybridization may have played a key role in coalescence at Morton Village. In the next chapter, Chapter 7, I will summarize the results of spatial analyses of vessel use, which will help to further explore vessel function at Morton Village and its relationship to social processes that were on-going at the site.

CHAPTER 7:

RESULTS OF SPATIAL ANALYSES

In this chapter, I outline the results of spatial analyses conducted to address Research Question 3, which seeks to contextualize patterns of vessel use by investigating the spatial distribution of cooking and serving practices at Morton Village and the comparative sites. These spatial analyses may reveal where different types of vessels were used at each site, where cooking occurred, and if particular spaces were preferred for certain practices. At Morton Village, spatial analyses can also reveal if foodways practices differed from those at the comparative sites or if vessel types and cooking techniques seen at the site were used throughout or only in certain spaces, such as public areas, which can inform us about processes of coalescence occurring at the site.

This chapter begins with the results of spatial analyses that examined the distribution of different vessel types at each site. Comparisons between sites were also made so as to detect distributional differences between them. Following these comparisons, I discuss the results of spatial analyses that explore the distribution of different vessel function categories across the three sites. Again, comparisons were made between the sites to uncover any differences in where certain functional categories were commonly used. These spatial analyses were conducted using the same samples of vessels examined in Chapters 5 and 6, and include use-alteration data generated from those analyses. As discussed in Chapter 4, all spatial analyses were performed using the same generalized categorical system. All vessels were initially divided by their location inside or outside of a structure. They were then placed into one of three spatial categories that are based on ethnographic data related to cooking: found within a structure, found within four meters of a structure, and found farther than four meters away from a structure. These generalized categories were used in order to enable comparisons between the different assemblages and to limit the biases created by the use of different excavation sampling strategies.

Results of Vessel Type Spatial Analyses

Site Level

As among the use-alteration analyses, spatial distributions were first examined at the site level, with all vessels from Morton Village combined into one pooled sample. Overall, all vessel types were found in a variety of contexts, indicating that vessels were used and discarded throughout each site (Figures 7.1 - 7.3). While different vessel types were found throughout each site, there were some variations in the spatial distributions present, primarily concerning the distribution of jars.

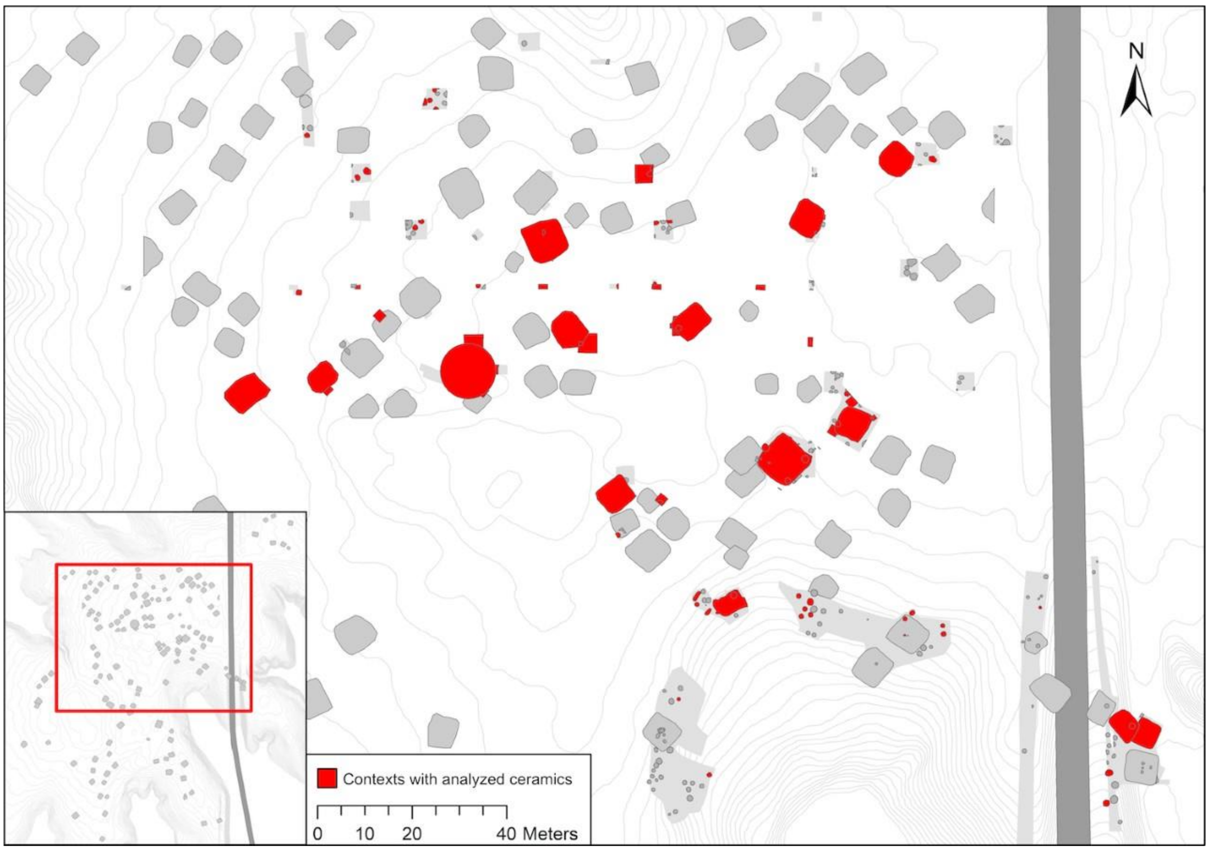

Figure 7.1. Core occupation area of the Morton Village site (area within red box on inset map). Contexts containing pottery analyzed for this dissertation are highlighted in red. Made using ESRI ArcGIS.

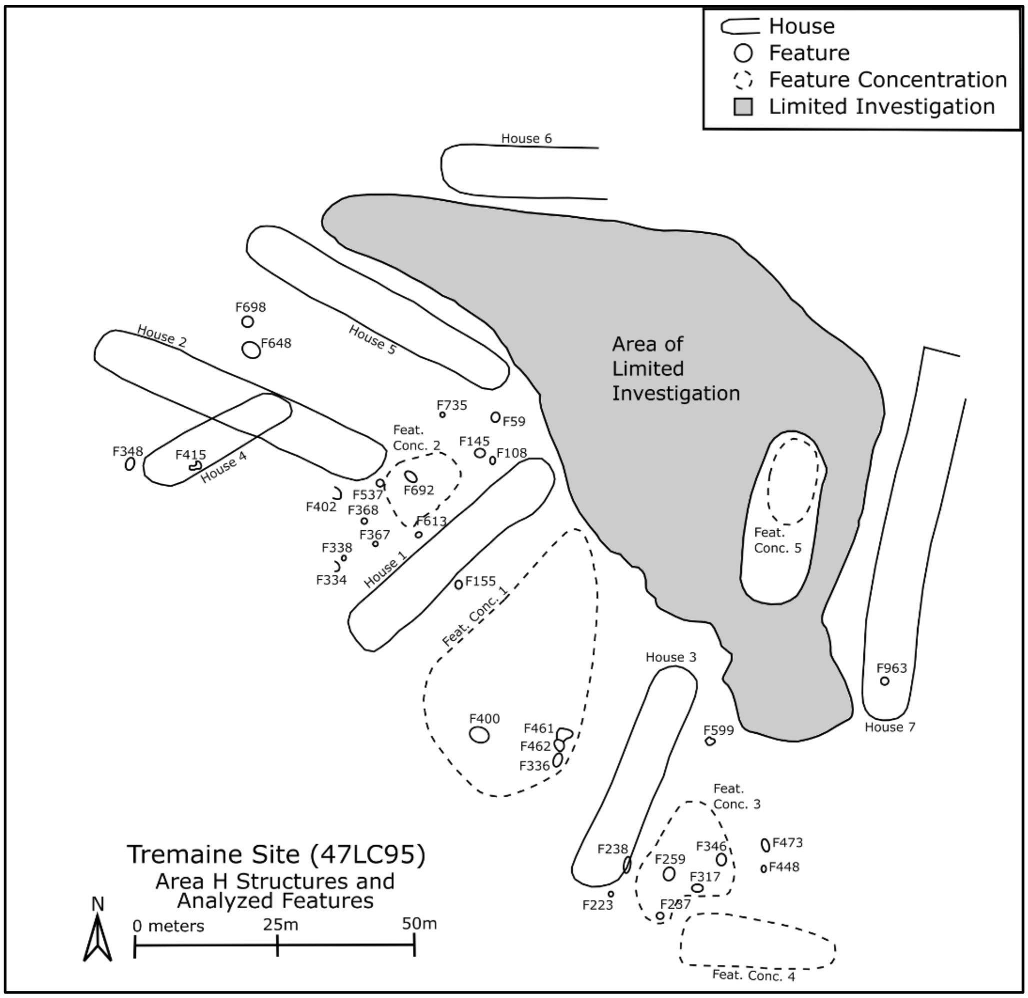

Figure 7.2. Map of Area H at the Tremaine site. Only features containing analyzed ceramics shown. Made using Inkscape, based on Figure 5.6 in O'Gorman 1995, page 57.

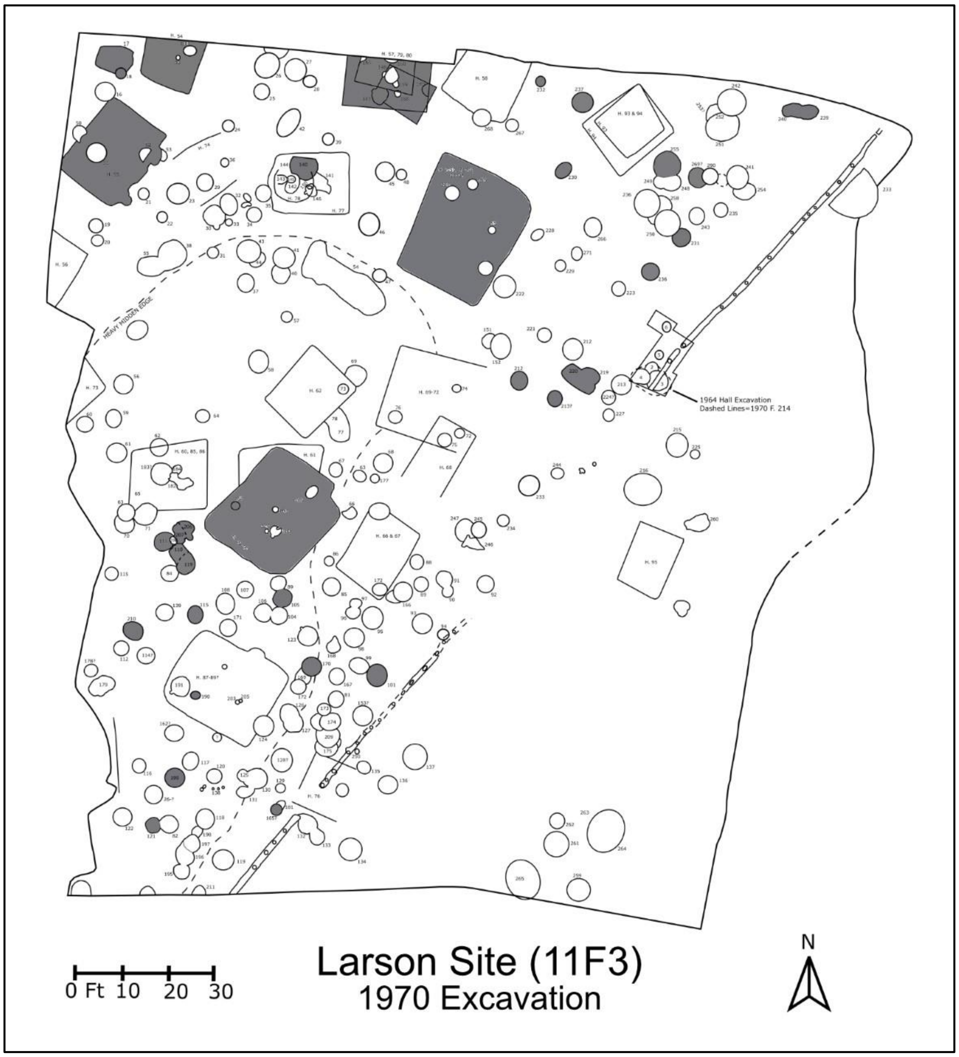

Figure 7.3. Map of the 1970 Larson site excavation area, made using Inkscape. Contexts with analyzed ceramics highlighted in dark grey. Original 1970 Larson excavation map on file at the Illinois State Museum-Dickson Mounds, used with permission of the Illinois State Museum.

At the Tremaine Complex, 41 jars analyzed for use-wear had sufficient provenience information within Area H (Figure 7.2) to be included in the analysis. Of those 41 jars, only three were found within structures (7.32%), while 38 were found outside of a structure (92.68%)

(Figure 7.4). At Morton Village, where 88 jars analyzed for use-wear had sufficient provenience information (Figure 7.1), the distribution was more even. Of the 88 jars, 45 were found within a structure (51.14%) and 43 were found outside (48.86%). The distribution of jars at Larson (n = 28; Figure 7.3) was intermediate between Morton Village and Tremaine, with 32.14% of jars found inside a structure and 67.85% found outside. Fisher's Exact comparisons of this data found that spatial patterns at both Morton Village and Larson significantly differ from the Tremaine Complex (p = 5.395E-07 and 0.01057 respectively), while they are more similar to each other (p = 0.08711). While not significant at the 0.05 level, this p-value is still low and suggests that differences are also present between Larson and Morton Village.

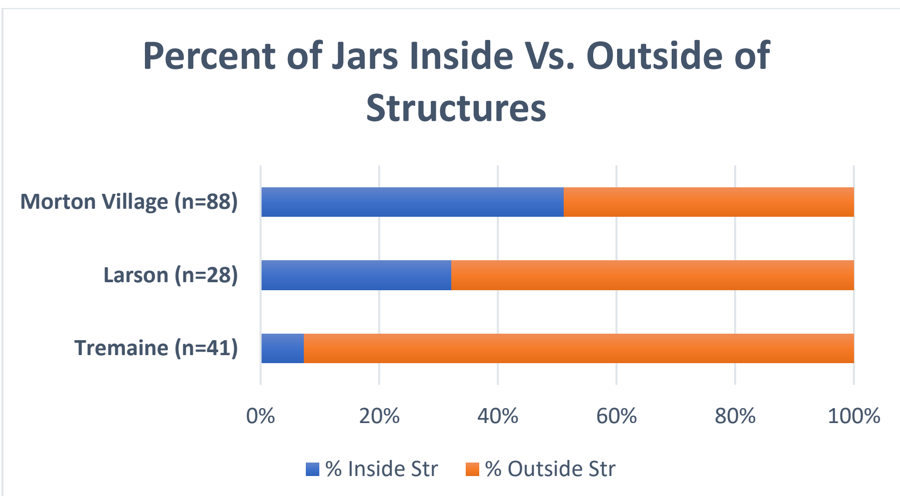

Figure 7.4. Percent of jars found inside and outside of structures at the site level.

After this initial exploration, the spatial distribution of jars was broken down further, using the three categories discussed above (Figure 7.5). Of the 41 jars analyzed from the Tremaine Complex, three were found within structures (7.32%), 10 were found within four meters of a structure (24.39%), and 28 were found farther than four meters from a structure

(68.29%). Again, a different pattern is found at Morton Village (n = 88), where 45 jars were found within structures (51.14%), 22 jars were within four meters of a structure (25%), and 21 jars were found farther than four meters away from a structure (23.86%). The distribution of jars at Larson (n = 28) was more even, as nine jars were found within a structure (32.14%), nine jars were found within four meters of a structure (32.14%), and 10 were found farther than four meters away (35.71%).

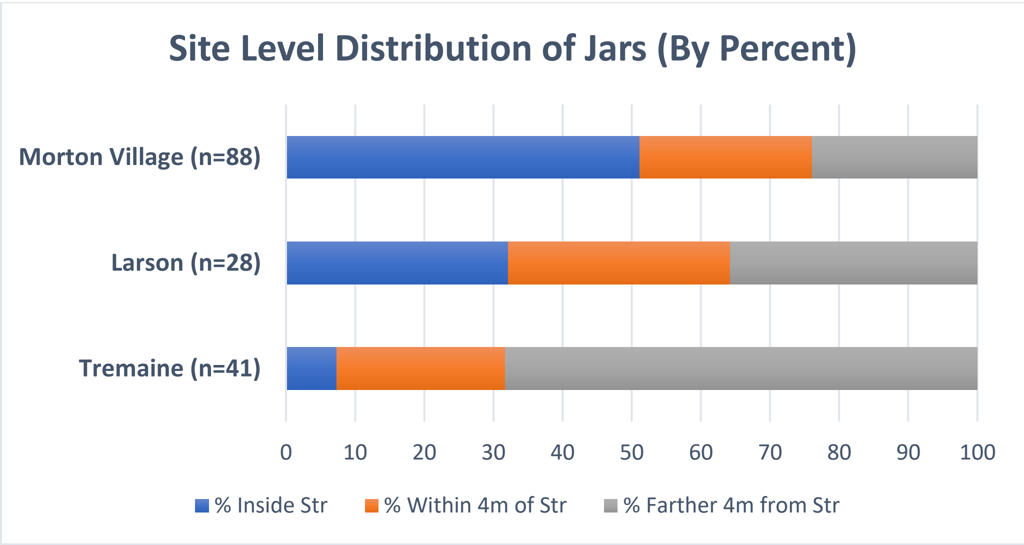

Figure 7.5. Distributions of jars at the site level.

Statistical comparisons of this data again indicate that the distribution of jars at the Tremaine Complex was significantly different than at Morton Village and Larson. When compared using a Fisher's Exact test, statistically significant p-value results were returned when the Tremaine Complex was compared to Larson ($p = 0.008768$) and when the Tremaine Complex was compared to Morton Village ($p = 1.31E-07$). A comparison of Morton Village to

Larson did not find any significant differences (*p* = 0.1833), indicating that the distribution of jars was generally similar between those two sites.

These differences between the Tremaine Complex and the other two sites may be partially explained by the different site structure and formation processes at the Tremaine Complex. Unlike Morton Village and Larson, the core of the Tremaine site is composed of a small number of large longhouses, with many activities taking place along structure walls and in a few concentrated activity areas in openings between them. While some features are found within these longhouses, most features are found outside of the structures. The longhouses themselves were represented by post-mold outlines, with no basin or living surface encountered except in a small portion of House 2 (O'Gorman 1995). At Morton Village and Larson, the villages are composed of a larger number of smaller structures, with features and activity areas scattered throughout the sites. Importantly, structures at these two sites were constructed on top of excavated basins (Bengtson and O'Gorman 2016; Harn 1994), whose use buried interior basin fills, features, and living surfaces deeper in the ground, protecting them from plowing and other ground disturbances. As such, deposits within structures are much more common at Morton Village and Larson compared to the Tremaine Complex, possibly accounting for the recovery of more ceramic vessels from structure contexts. Alternatively, different abandonment processes between the sites may have led to a lack of materials left on longhouse floors at the Tremaine Complex compared to Morton Village and Larson. At Morton Village and Larson, some structures appear to have been burned with materials left inside, indicating that the houses may have been occupied during their destruction and were then subsequently abandoned after a catastrophic fire, encapsulating the materials left behind (Harn 1994; Santure et al. 1990). At the Tremaine Complex, evidence for fire is less common (O'Gorman 1995), opening the possibility that houses may have been emptied of valuable material and then abandoned at the end of their use-lives, leaving less material within the structures.

In either case, it is possible that the majority of jars at the Tremaine Complex were used in open areas away from structures, while jars at Morton Village and Larson were used more frequently in and nearby structures. While cooking undoubtedly occurred in longhouses at the Tremaine Complex, it is possible that many daily activities and trash disposal episodes occurred in the concentrated activity areas adjacent to longhouses, impacting the distribution of jars at the site. Seasonality at the three sites may also factor into these patterns, as faunal and floral analyses at the Tremaine Complex have indicated that the site was primarily occupied during the warm season (O'Gorman 1995), when ethnographic records indicate that cooking was done outside. Unlike the Tremaine Complex, Larson may have been occupied all year (Harn 1994), but more research is required to substantiate this argument. Similarly, more research on seasonality is needed at Morton Village, but early indications suggest that the site was also a warm season occupation like the Tremaine Complex (Santure et al. 1990), calling into question the impacts of seasonality on the different spatial patterns seen at the sites.

Unlike jars, the distribution of bowls and plates, only found at Morton Village and Larson, did not vary greatly between the sites (Figures 7.6 and 7.7). At Morton Village, 35.21% of 71 bowls from the site were found within structures, while 64.79% were found outside. Spatial patterning among bowls (n = 15) at Larson is a little more extreme, with 13.33% found within structures and 86.66% found outside, but still documents an emphasis on using bowls outside of structures. When these patterns are further divided, results are again similar, with the largest percentage of bowls at both sites found farther than four meters away from a structure. At Larson, 53.33% of bowls were found farther than four meters away from a structure and 33.33%

were found within four meters of one, while 40.85% of bowls at Morton Village were found farther than four meters away and 23.94% were found within four meters. A Fisher's Exact test comparing the bowl distributions at these sites found no significant difference between them (p = 0.2369), further indicating that bowl distributions were similar at Morton Village and Larson.

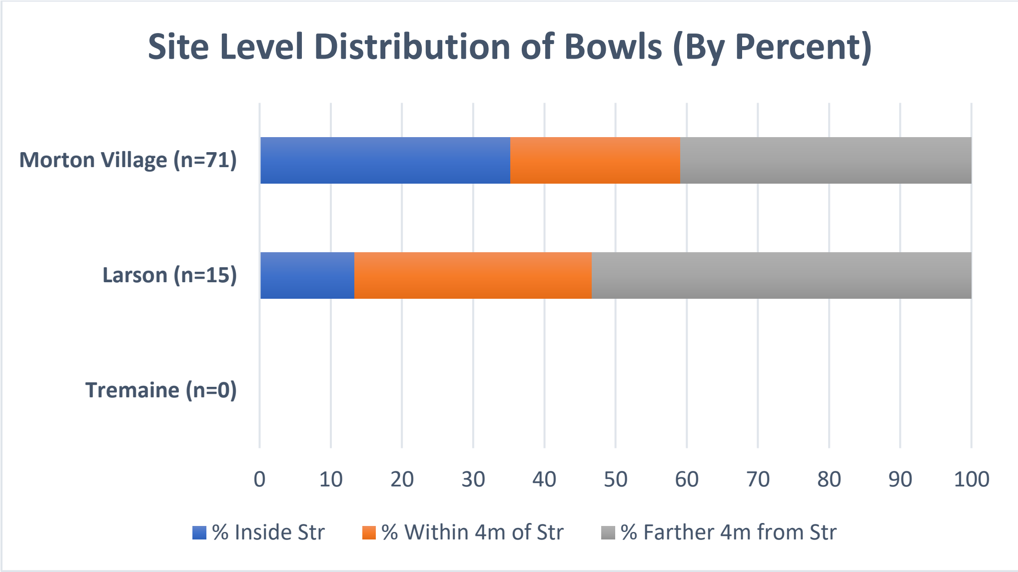

Figure 7.6. Distributions of bowls at the site level.

The distribution of plates at the sites was also similar (Figure 7.7). At Morton Village, plates were evenly distributed between inside and outside contexts, with 50% of the 40 plates included in this analysis originating from within structures. Of the half of the plate sample found outside, 22.5% of the plate sample was found within four meters of a structure and 27.5% were found farther than four meters away. The majority of plates at Larson (n = 21), 66.67%, were found in outside contexts, while 33.33% were found within structures. When divided further, the distribution of plates at Larson is more even, with 33.33% of the 21 analyzed plates found within structures, 28.57% found within four meters of a structure, and 38.1% found farther than four meters away. Again, a Fisher's Exact test found no significant differences between these distributions ($p = 0.4803$).

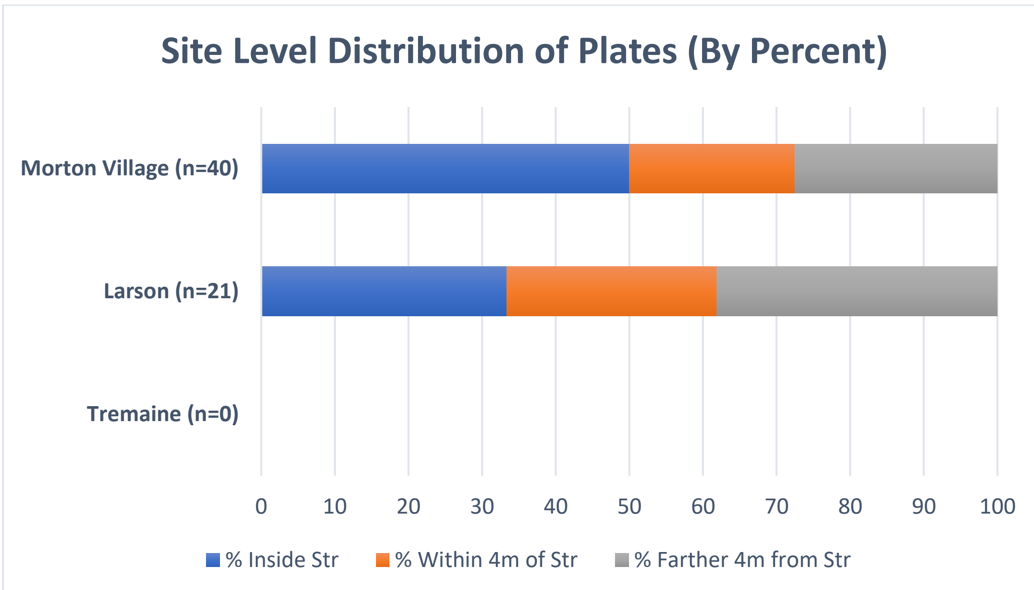

Figure 7.7. Distributions of plates at the site level.

Intra-Site Level

After the site level analysis was completed, the Morton Village sample was divided into Mississippian-style and Oneota-style ceramics to investigate intra-site distribution patterns (Figure 7.8). Data used for the site level spatial analysis at Larson and the Tremaine Complex was used again for comparative purposes.

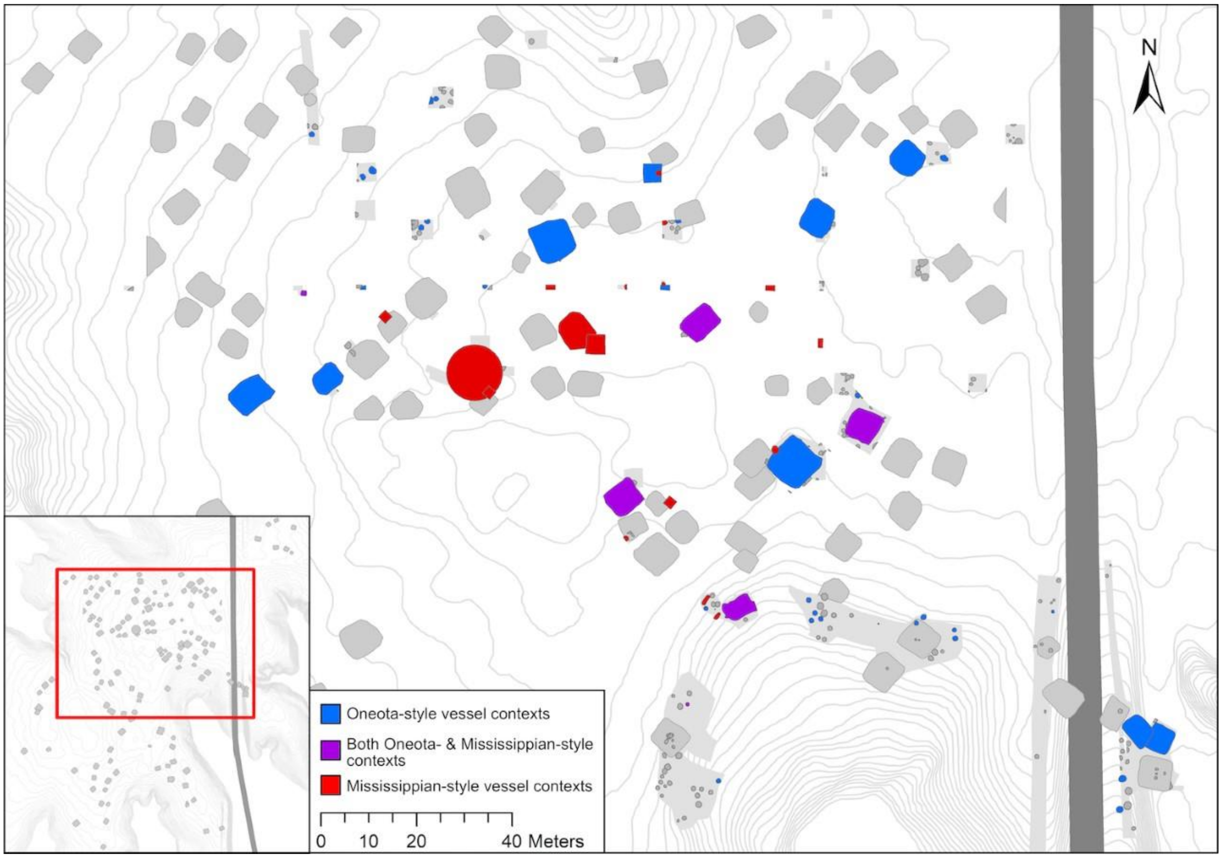

Figure 7.8. Map of Morton Village showing the contexts for analyzed ceramic vessels, split by stylistic categories.

When the distribution of jars was examined for the intra-site spatial analysis, the results were similar to what was seen in the site level analysis. Among Mississippian-style jars (n = 16), 62.5% of jars were found within a structure, while 37.5% were found outside (Figure 7.9). Of the Oneota-style jars (n = 66), 46.97% were found within a structure and 53.03% were found outside of one. Both of these patterns differ markedly from those at the Tremaine Complex, but are closer to trends seen at Larson.

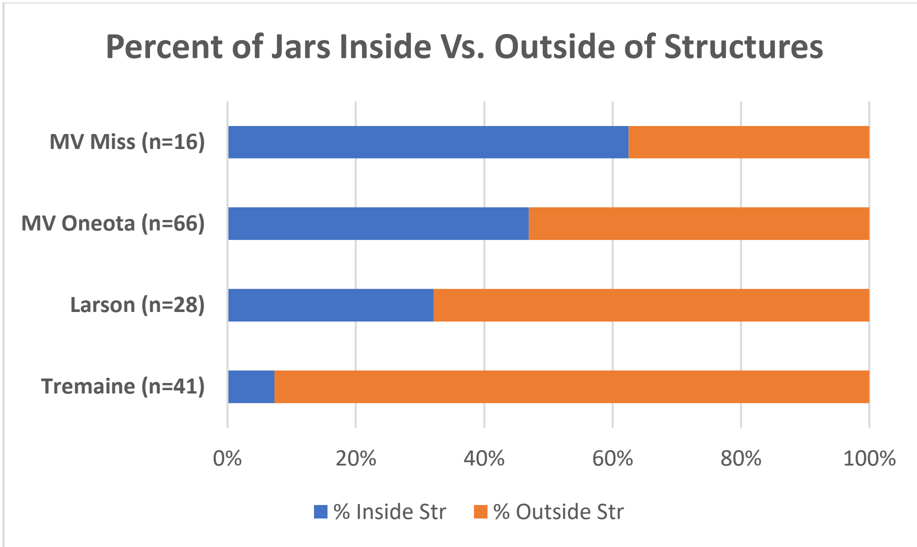

Figure 7.9. Distributions of jars inside and outside of structures, at the intra-site level.

While patterns from Morton Village are similar at a general level, some small differences do become apparent when the data is divided further (Figure 7.10). Among the Oneota-style jars (n = 66), 46.97% were found within a structure, while 30.3% were found within four meters and 22.73% were found farther than four meters away. The Mississippian-style jars (n = 16) had a more uneven distribution, with most jars being found only within or farther than four meters away from a structure. 62.5% of Mississippian-style jars were found within a structure and 31.25% were found in open areas farther than four meters away, while only one jar (6.25%) was found within four meters of a building. A comparison of these distributions through a Fisher's Exact test resulted in a p-value of 0.1137, which is low but not clearly statistically significant. Much of the variation between the two lies in the ratio of jars found within four meters of a structure, which was much lower among Mississippian-style jars.

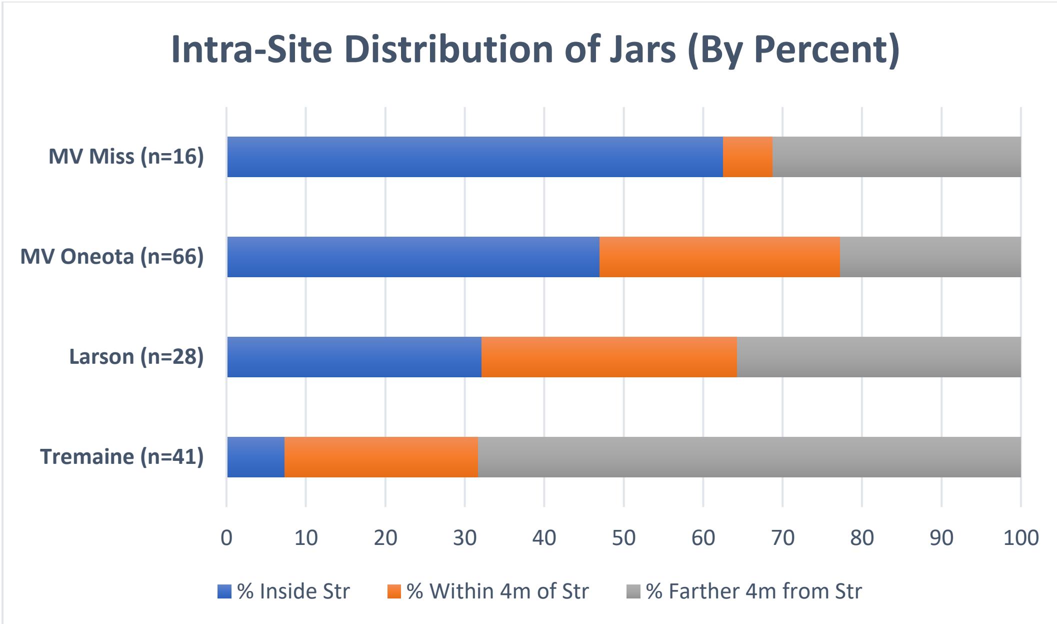

Figure 7.10. Distributions of jars at the intra-site level.

When compared to Larson and the Tremaine Complex, major differences with the Tremaine Complex again were visible (Figure 7.10). In general, more jars were found in structures among both Morton Village sub-samples, while the majority of jars at the Tremaine Complex were found farther than four meters from a building. Results of Fisher's Exact comparisons with the Tremaine Complex were strongly significant for both Morton Village sub-samples (Oneota-style p = 7.54E-07, Mississippian-style p = 7.45E-05), further indicating major differences in the distribution of jars between the three assemblages. Comparisons with Larson were more complicated. Similar to jars at Larson, Oneota-style jars at Morton Village were more evenly distributed across the three zones, albeit with an emphasis on jars found in structure interiors. As such, a Fisher's Exact test found no significant difference between the distribution of jars at Larson and Oneota-style jars at Morton Village (p = 0.2184). Due to the more uneven distribution of Mississippian-style jars at Morton Village, their comparison to Larson resulted in a lower p-value, 0.08527, which, while not significant at the 0.05 level, does suggest that distributional differences between the two assemblages may be meaningful. While both of the assemblages differ greatly from the distribution seen at the Tremaine Complex, only the distribution of Mississippian-style jars at Morton Village may differ from Larson.

When the distribution of bowls within or outside structures is examined, both sub-assemblages from Morton Village have nearly identical patterns. Out of 25 Oneota-style bowls from Morton Village, 32% were found within structures and 68% were found outside of them. Among a smaller sample of Mississippian-style bowls (n = 9), 33.33% were found within a structure and 66.67% were found outside. These rates match closely to the patterns seen at the site level, and indicate that a majority of bowls at Morton Village were used in outside contexts. At Larson, the majority of bowls were also used outside, suggesting that the spatial organization of bowl use did not differ greatly between the three assemblages.

While the above bowl distributions at Morton Village appear almost identical, some variations became visible when these spatial patterns were divided further (Figure 7.11). As at Larson, over half of the Oneota-style bowls at Morton Village (n = 25) were found farther than four meters away from a structure. In total, 56% of the bowl assemblage were found in such contexts, while 12% were found within four meters of a structure and 32% were found within structures. Unlike Larson, though, more Oneota-style bowls were found inside structures than just outside of them. Mississippian-style bowls at Morton Village (n = 9) were distributed more evenly, with 33.33% recovered in structures, 44.44% found within four meters, and 22.22% found farther than four meters from a structure. While Oneota-style bowls followed more closely to the patterns seen at Larson, Fisher's Exact comparisons of the two Morton Village bowl sub-assemblages to Larson found no significant differences between the sites (Oneota-style p = 0.1684, Mississippian-style p = 0.3052). A comparison of the two Morton Village sub-samples, on the other hand, did result in a low p-value, 0.07613, which further suggests that the differences in bowl distribution between the two may be meaningful. As the Mississippian-style sample is composed of a small number of bowls, it is also possible that this difference is a result of sampling error.

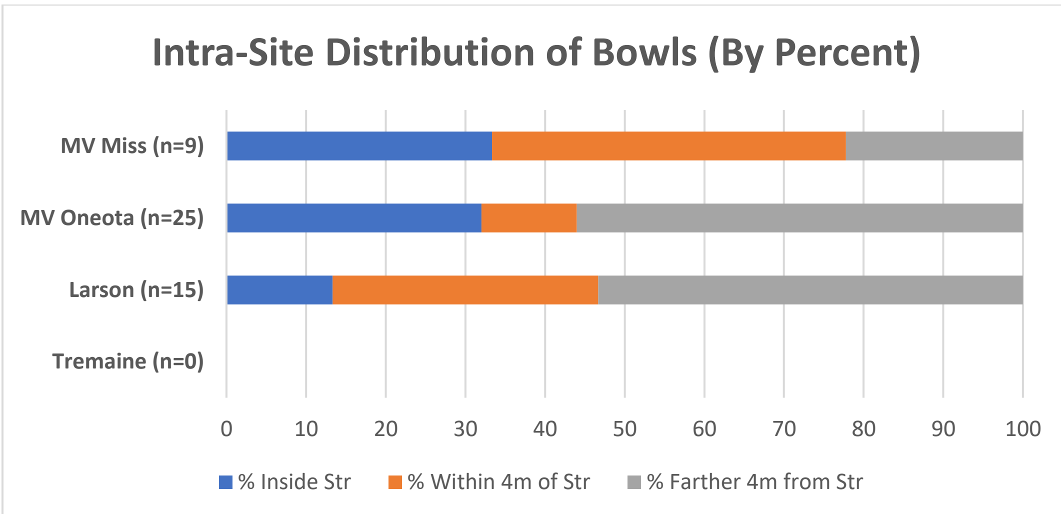

Figure 7.11. Distributions of bowls at the intra-site level.

Unlike jars and bowls, the distribution of plates was generally similar between the three assemblages. At Morton Village, 48.15% Mississippian-style plates (n = 27) were found inside a structure and 51.85% were found outside, while 40% of Oneota-style bowls (n = 10) were found inside and 60% were found outside. Both of these patterns are close to that seen at Larson, where 33.33% of 21 plates were found within structures and 66.7% were found outside.

When divided further, spatial patterns among the three assemblages continued to be similar to each other (Figure 7.12). Mississippian-style plates at Morton Village (n = 27) tended to be found more within structures, with 48.15% of the assemblage found in such contexts. The other plates were divided evenly between the other two spatial categories (25.93% each). Oneota-style plates at Morton Village and plates at Larson were distributed more evenly. At Larson, 33.33% of the 21 plates examined were found within structures, while 28.57% were found within four meters of a structure and 38.1% were found farther than four meters away. A nearly identical pattern is found among Oneota-style plates at Morton Village, albeit with a much smaller sample size of 10 plates. Of those 10, 40% were found within structures, 20% were found within four meters of one, and 40% were found farther than four meters away. Fisher's Exact comparisons match these results, with the comparison between Mississippian-style plates at Morton Village and plates at Larson resulting in the lowest p-value ($p = 0.5807$). Comparisons between the two Morton Village sub-samples resulted in a p-value of 0.7177, while comparisons between Oneota-style plates at Morton Village and plates at Larson resulted in a p-value of 1.0. Overall, both the data and the comparisons indicate that the distributions of plates were relatively similar between the three assemblages, with the Oneota-style plates from Morton Village matching Larson more closely.

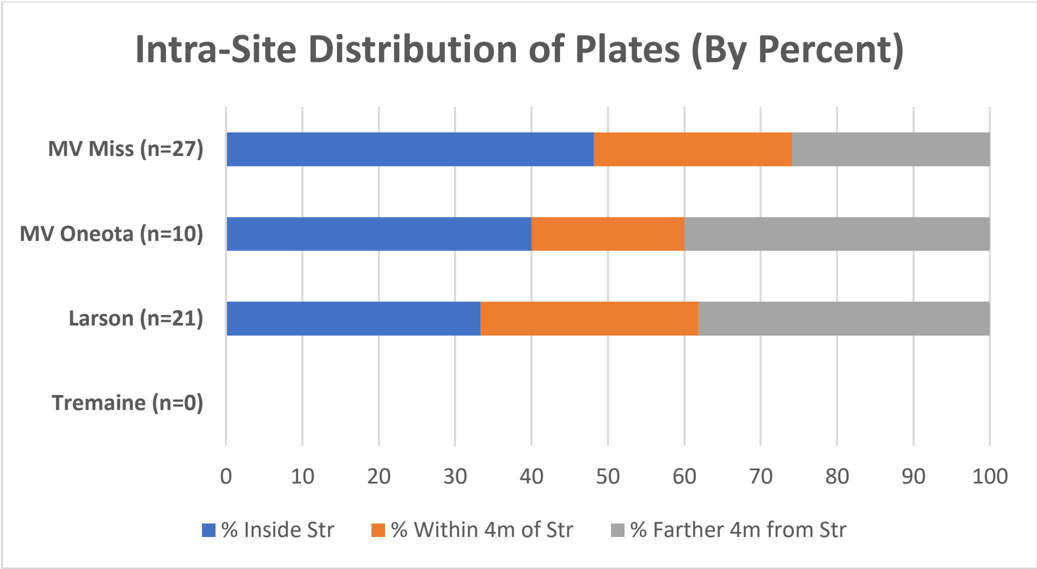

Figure 7.12. Distributions of plates at the intra-site level.

Summary of Vessel Type Spatial Analyses

From this data, it is clear that all vessel types were used, or at least thrown away, in a variety of contexts at each site. Jars, as expected, were used frequently in a number of contexts, but the distribution of bowls and plates also shows a similar pattern. As use-alteration analyses have shown that bowls were used for a number of different tasks, it is likely that they would have been used in a number of situations, possibly explaining their wide distribution through the sites. The wide distribution of plates is more interesting, as they are commonly considered serving and special use vessels reserved for specific events (Hilgeman 2000). As such, it would be expected that the distribution of these vessels would be more restricted and their use emphasized in public places. Combined with the use-alteration data presented in this dissertation, this wide spatial distribution suggests that plate use-lives were more complex than often argued. It is possible that plates may have been used in a wider variety of tasks throughout the community, or, as Hilgeman (2000:201-203) has argued, that plates functioned as “utilitarian ritual ware” (Emerson

1989:63) that were used for specific purposes and then broken and unceremoniously discarded once their purpose was fulfilled. Alternatively, the distribution of plates and other vessel types at Morton Village and Larson may relate more to discard practices than actual vessel use, masking the true spatial distributions of their use.

While vessels were used in a variety of spaces at each site, differences do exist in the spatial distributions of vessel types and where they may have been used more frequently. These differences between the sites may relate to variations in foodways practices, but it must also be acknowledged that trash disposal patterns and other practices likely impacted these distributions as well. In both the site and intra-site analyses, the most significant difference was in the distribution of jars at the Tremaine Complex. The large majority of jars at the Tremaine Complex were found in open areas farther than four meters away from a structure, while jars at Morton Village were more commonly found within structures and jars at Larson were evenly distributed between the three spatial zones. This difference may be a result of different cooking and vessel use practices, where most jars were used in open outdoor settings at the Tremaine Complex and in more varied locations at Morton Village and Larson. However, the possibility of different formation processes related to building construction styles or abandonment processes cannot be ruled out as a contributing factor.

While different formation processes and trash disposal practices likely contributed to this distribution, it is possible that a large amount of cooking at the Tremaine Complex occurred outdoors. The presence of longhouses at the Tremaine Complex indicates that households at that site were likely organized differently compared to the other two sites (Brown 1970; O'Gorman 2010), which may have impacted patterns of subsistence and cooking and led to an emphasis on communal behaviors. Jars are also significantly larger at the Tremaine Complex, further suggesting that cooking may have been a more communal affair at the site, where food was regularly cooked in public for larger groups of people. Since jars were the only vessel type found in large numbers at the site, they also would have been regularly used for larger events and gatherings, further increasing the use of jars in open areas at the site. At Morton Village and Larson, cooking may have occurred in more varied locations, including inside structures, and regularly fed smaller groups of people. As vessel distributions at Morton Village match more closely with those at Larson than with those at the Tremaine Complex, it appears that residents living at Morton Village likely practiced a foodways pattern more aligned to local traditions in the CIRV.

Interestingly, while no significant differences in vessel distributions exist between Larson and Morton Village or between the Mississippian- and Oneota-style sub-samples at Morton Village, the distributions seen among the Oneota-style vessels at Morton Village match the patterns at Larson more closely, not the Mississippian-style sub-sample. This pattern, combined with the adoption of new vessel types, suggests that migrants living at Morton Village, not just local residents, may have practiced foodways patterns common to the local region. As Oneota-style vessels were used throughout Morton Village and not just in public spaces, it is also possible that new practices at the site were not just emphasized in public, but were being incorporated into everyday contexts as well. Again, while a number of practices and processes besides foodways behaviors may have impacted these patterns, migrants at Morton Village may have been adopting some practices from their neighbors, helping to create a shared foodways pattern that could act as a common ground for interactions and social negotiation.

Results of Vessel Function Spatial Analyses

After completing spatial analyses investigating the distribution of different vessel types, the spatial distribution of different functional categories was explored. These analyses were completed as a means to examine if there were any patterns present regarding where certain functional categories were used. For these investigations, the same vessel data and spatial zones as used in the vessel type analyses are explored again, but with use-alteration data added as another dimension of information. As this use-alteration data further divides the ceramic assemblages being considered, sample sizes in this section are often small. Because of these small sample sizes, data was compared using descriptive statistics to reveal any general patterns in the data. When sample sizes were appropriately large and further comparison was needed, Fisher's Exact tests were used as a simple means of determining if perceived differences were meaningful.

As seen during the vessel type analyses, the use of major cooking techniques is also found scattered throughout each site, with some spatial zones occasionally emphasized over others. Distribution patterns of functional categories commonly follow the distribution patterns seen in the vessel type data; for example, jars used for wet mode cooking at Morton Village generally follow the distribution trends for jars overall at the site, but there are some exceptions. Below, the results of spatial analyses regarding vessel functional categories are outlined in more detail, beginning with site level analyses that treat all vessels from Morton Village as one sample. These results are followed by the intra-site level analyses, in which the Morton Village ceramic assemblage is divided into Oneota- and Mississippian-style sub-assemblages.

Site-Level

When examined at a general level, it is clear that most jar functional categories at the Tremaine Complex were performed outside of structures, with four of the six cooking techniques done entirely outdoors (Figure 7.13). Only a small percentage of storage and stewing/multi-purpose jars (16.67% and 16.67% respectively) were found within structures at the site. Jar use was more varied at Morton Village and Larson, where each functional category was used both within and outside of structures. While jars were used in a variety of locations at both sites, jars at Morton Village were found within structures more frequently, except for dry mode cooking, which was slightly more prevalent within structures at Larson. In particular, jars used for storage/serving (63.64% vs. 20%) and wet mode cooking (50% vs. 20%) were found indoors at Morton Village at much greater rates compared to Larson.

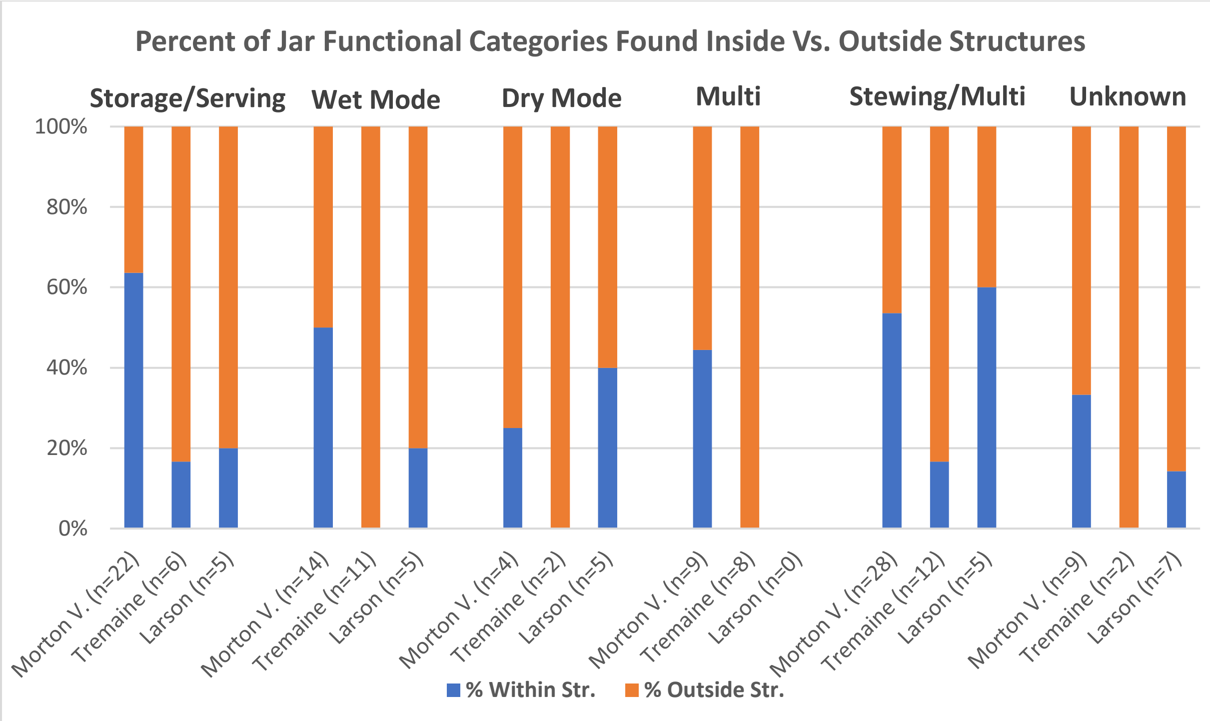

Figure 7.13. Percent of jar functional categories found inside or outside of structures.

When divided further, more details about these patterns became visible (Figure 7.14). At Morton Village, the majority of storage/serving jars (n = 22) in this sample were found within structures (63.34%), while smaller amounts were found outside. Only 9.09% of storage/serving jars were found within four meters of a structure and 27.27% were found farther than four meters away. The opposite pattern is visible at Larson and the Tremaine Complex, albeit with smaller sample sizes. At Larson, the majority of storage/serving jars (n = 5) were found outside of structures, with 40% found within four meters of a structure and 40% found farther than four meters away. Only 20% were found within a structure. At the Tremaine Complex (n = 6), 66.67% of storage/serving jars were found farther than four meters from a structure, while 16.67% were found within four meters and 16.67% were found within a structure (See Figure 11).

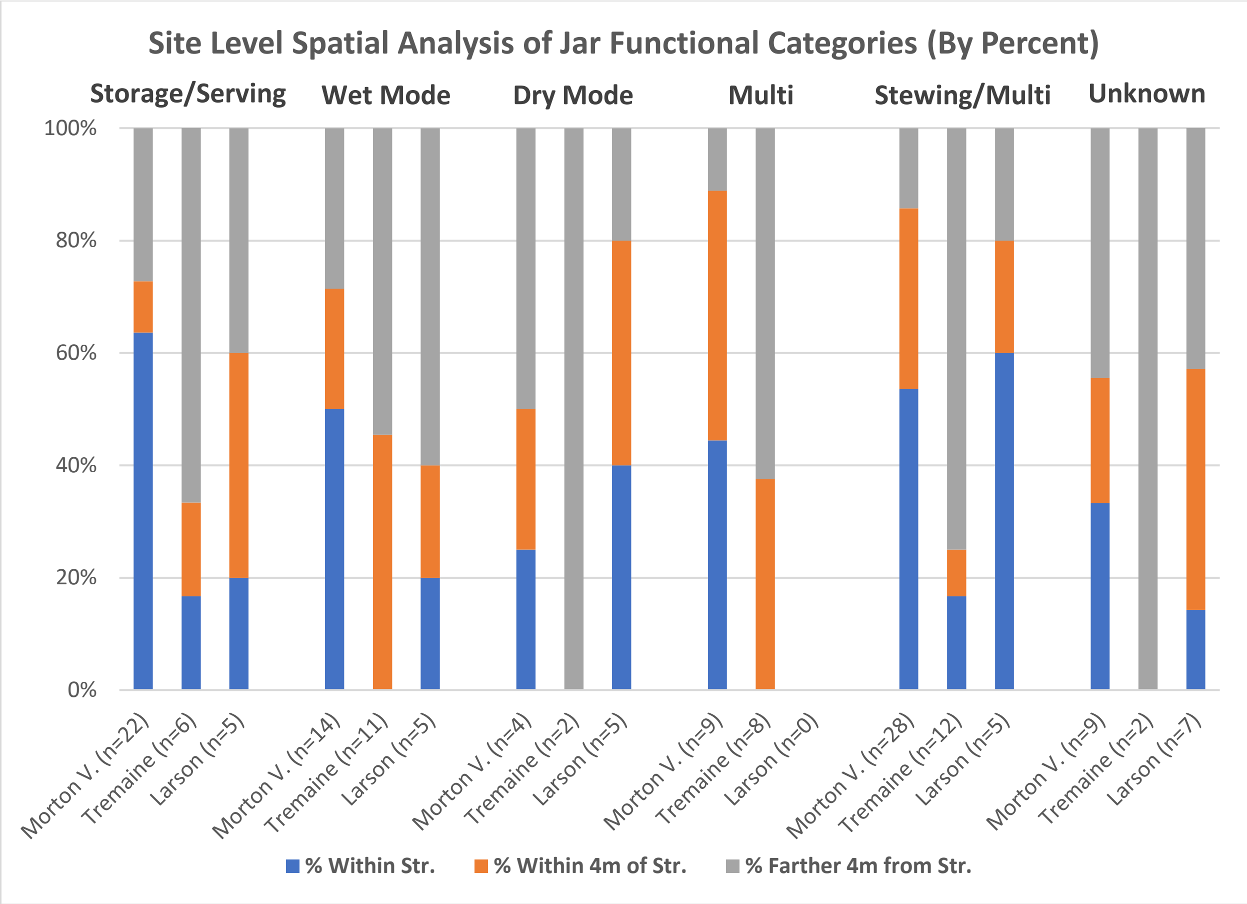

Figure 7.14. Distribution of jar functional categories at the site level.

This opposite pattern between the sites may indicate that there were spatial differences in storage and serving practices, possibly resulting from more storage occurring within homes at Morton Village and outdoors at Larson and the Tremaine Complex. Unfortunately, other factors, particularly small sample sizes at two of the sites and different formation processes within the Tremaine Complex, complicate the interpretation of these patterns. Spatial patterns at Larson and the Tremaine Complex, represented by a very small number of vessels, may be a factor of the vagaries of sampling, and, as mentioned previously, the lack of interior structure contexts at the Tremaine Complex may have had a significant impact on the distribution of vessels at that site.

As such, caution must be used when comparing the distributional patterns of different functional categories seen at the three sites.

Among the jars used for cooking, jars used for wet mode cooking or multi-purpose cooking were distributed in patterns similar to above. In general, wet mode jars at Morton Village (n = 14) were found more frequently within structures, while smaller percentages were found in the two spatial zones outside of them. At the Tremaine Complex and Larson, the majority of wet mode jars (n = 11 and 5 respectively) were found in areas outside of structures. This pattern was most extreme at the Tremaine Complex, where no wet mode cooking jars were found within a longhouse. The same opposing patterns were found when multi-purpose jars were considered. In general, nearly all multi-purpose jars at Morton Village (n = 9) were found inside or within four meters of a structure, while the majority of multi-purpose jars at the Tremaine Complex (n = 8) were found farther than four meters from a structure. No multi-purpose jars were analyzed from Larson.

Interestingly, jars used for dry mode cooking or stewing/multi-purpose cooking did not follow these general patterns for all sites. While the sample sizes for dry mode jars are very small, they tend to be found outside of structures at all sites. At Morton Village, dry mode jars (n = 4) are the only vessel use type, aside from those with unknown functions, for which the majority of vessels were found outside of structures. Only one dry mode vessel was found within a structure, while the rest were found outside of one. At Larson, dry mode jars (n = 5) were distributed at relatively even rates between the three zones, but tend to be found within and nearby structures more frequently than with wet mode and serving/storage jars from the same site. The only site to continue trends seen with the other cooking techniques was the Tremaine Complex, where all dry mode jars (n = 2) were found farther than four meters away from a structure. While these sample sizes are very small and might not accurately represent the distribution of jars used for dry mode cooking at each site, these patterns could signal that the use of dry mode cooking occurred more frequently in different areas of Morton Village and Larson compared to the other cooking techniques.

Jars used for stewing/multi-purpose cooking also followed a different pattern at Larson. While the sample size is small, the majority of stewing/multi-purpose jars at that site (n = 5) were found within structures, the opposite of spatial patterns seen among wet mode and storage/serving jars. At Morton Village, stewing/multi-purpose jars (n = 28) follow the common pattern seen among other jars at the site, with the majority being found within structures. The rest of the stewing/multi-purpose jars were more frequently found within four meters of a structure, with only 14.29% of these jars being found farther than four meters away. Stewing/multi-purpose jars at the Tremaine Complex (n = 12) also follow the typical spatial pattern for that site, with 75% of those jars being found farther than four meters away from a structure.

Among jars used for unknown purposes, most were found outside of structures at each site. At the Tremaine Complex, both the jars with unknown functions from that site were found farther than four meters away from a structure. While more dispersed, a similar pattern is seen at Larson, where only 14.29% of the jars with unknown functions (n = 7) were found within structures. At Morton Village, jars with unknown functions (n = 9) are relatively evenly dispersed between the three spatial zones, a pattern that is different from all of the other jar use types found at the site.

Overall, while small sample sizes limit the level of confidence in the accuracy of these patterns, it is clear that different jar uses were not limited to certain parts of the sites considered, except possibly at the Tremaine Complex, where most activities appear to have taken place in open areas away from structures. While this pattern is clearly visible at the Tremaine Complex, such a restricted distribution of jars at the site may also be the result of past trash disposal activities or formation processes. Aside from the Tremaine Complex, cooking and other activities appear to have been dispersed throughout each site, but it is possible that some variations exist in where certain cooking activities occurred. For example, at Morton Village, most cooking techniques appear more frequently within structures, except for jars used for dry mode cooking and unknown purposes. While small sample sizes again must be recognized, these differences in distribution may indicate that there were different preferred areas of use for specific cooking techniques, such as wet mode cooking done inside and dry mode cooking done outside. In addition to variations within a single site, there also appear to be differences in the distribution of certain cooking techniques between sites as well. As was clear from the use-wear data, cooking techniques are often distributed differently at the Tremaine Complex compared to the other two sites, but there are also some differences between Larson and Morton Village. In general, each site had its own unique distributions of cooking techniques within the jar vessel class.

Due to very small sample sizes among bowls and plates that were used for different cooking techniques, bowls and plates were analyzed using more coarse-grained methods. While bowls and plates were used in varied ways, most of the different vessel use categories are only represented by a few vessels, providing an inaccurate understanding of their distributions. To account for these small samples, bowls and plates were lumped into two larger categories, storage/serving and cooking, whose spatial distributions were then examined.

After adjusting the data, the distributions of bowls at Morton Village and Larson were found to be similar. In general, bowls used for both storage/serving and cooking were found more frequently outside of structures at both sites, but bowls at Morton Village were more evenly distributed than at Larson. At Morton Village, only 37.84% of storage/serving bowls (n = 37) and 32.35% of cooking bowls (n = 34) were found inside structures, while no storage/serving bowls (n = 5) and 20% of cooking bowls (n = 10) at Larson were found inside. Instead, serving/storage and cooking bowls at both sites were predominately found outside. At Morton Village, 62.18% of serving/storage and 67.65% of cooking bowls were found outside, while 100% of serving/storage and 80% of cooking bowls at Larson were found outside. In particular, when the spatial data was divided further, more bowls in both use-categories were found in open areas farther than four meters from a structure. At Morton Village, 40.59% of storage/serving bowls and 41.18% of cooking bowls were found in such contexts, while at Larson those percentages were 40% and 60% respectively.

Unlike bowls, plates at the two sites have different distributions. At Morton Village, the majority of the 30 plates used for serving or storage, 56.37%, were found inside structures, while 43.63% were found outside. When exterior contexts are further divided, 20% of serving or storage plates were found within four meters of a structure and 23.33% were found farther than four meters away. The 10 plates at the site used for cooking tend to be found outside, with 30% found within a structure and 70% outside. Of those outside, 30% of the total cooking plate sample were found within four meters of a structure, and 40% were found farther than four meters away. These patterns are the opposite of what was expected, because one would expect that most serving vessels, if they were used primarily in multi-family gatherings, would be used and broken in communal open areas, not more private locations.

Of the 17 plates used for serving or storage at Larson, only 29.41% are found inside structures, while 70.59% were found outside. When outside contexts are divided, 29.41% are found within four meters of a structure and 41.18% are found farther than four meters away. Plates used for cooking (n = 4) were more frequently found within structures, with half being found in such contexts. One plate each was found in the two exterior spatial zones. While this is a very small sample size, it could indicate that Larson and Morton Village have opposing patterns of plate distribution.

As observed among the jars, different bowl and plate functional categories are scattered throughout Morton Village and Larson; there are no clear restrictions on where certain types of functions could be performed. That being said, some areas were more preferred for certain functions over others at each site. Different bowl functions in general were scattered throughout each site, but plates at both sites appear to have preferred areas of use. For example, at Morton Village, serving plates were more frequently found inside of structures, while the majority of cooking plates were found outside, often in open areas more than four meters from a structure. It is also interesting that opposite plate distributions were apparent at Larson and Morton Village, possibly signaling some differences in the practices involving plate use.

Intra-Site Level

After the site level examinations were completed, the Morton Village data was then divided into Oneota- and Mississippian-style vessels to uncover any differences in the distribution of various functional categories between the two stylistic groups. As seen with the Larson data, small sample sizes hamper the ability to detect differences in some cases within the Morton Village site.

As seen at the site level, jars with different functions among both stylistic groups were found scattered throughout Morton Village (Figure 7.15 and 7.16). There also are some variations present in the distributions of different cooking techniques between the two sub-assemblages. As noted above, the accuracy of comparisons is compromised by small sample sizes; the sample for Mississippian-style jars at Morton Village is much smaller than the Oneota-style jars (16 vs. 66). A number of possible differences in distribution may be due largely to the vagaries of sampling and not true differences between the two sub-assemblages.

When the percentage of jar functional categories found inside and outside structures were compared at Morton Village, some differences in distribution are apparent (Figure 7.15). Overall, only jars used for storage or serving purposes were found at similar rates among the two stylistic groups, while all of the other categories appear to have different spatial distributions. This is especially true among jars used for dry mode cooking, multi-purpose cooking, stewing/multi-purpose cooking, and in the unknown vessel function category, whose patterns vary greatly. For example, all Oneota-style jars used for dry mode cooking (n = 3) were found outside of structures, while all Mississippian-style dry mode jars (n = 1) were found within structures. Over 85% of Mississippian-style jars used for stewing/multi-purpose cooking (n = 7) were found within structures, while Oneota-style stewing/multi-purpose jars (n = 21) were more evenly distributed, with 43% found inside and 57% found outside. While distributional differences exist, small sample sizes likely have an impact on these patterns, and it is still apparent that most cooking techniques among both stylistic sub-assemblages were found in both indoor and outdoor contexts.

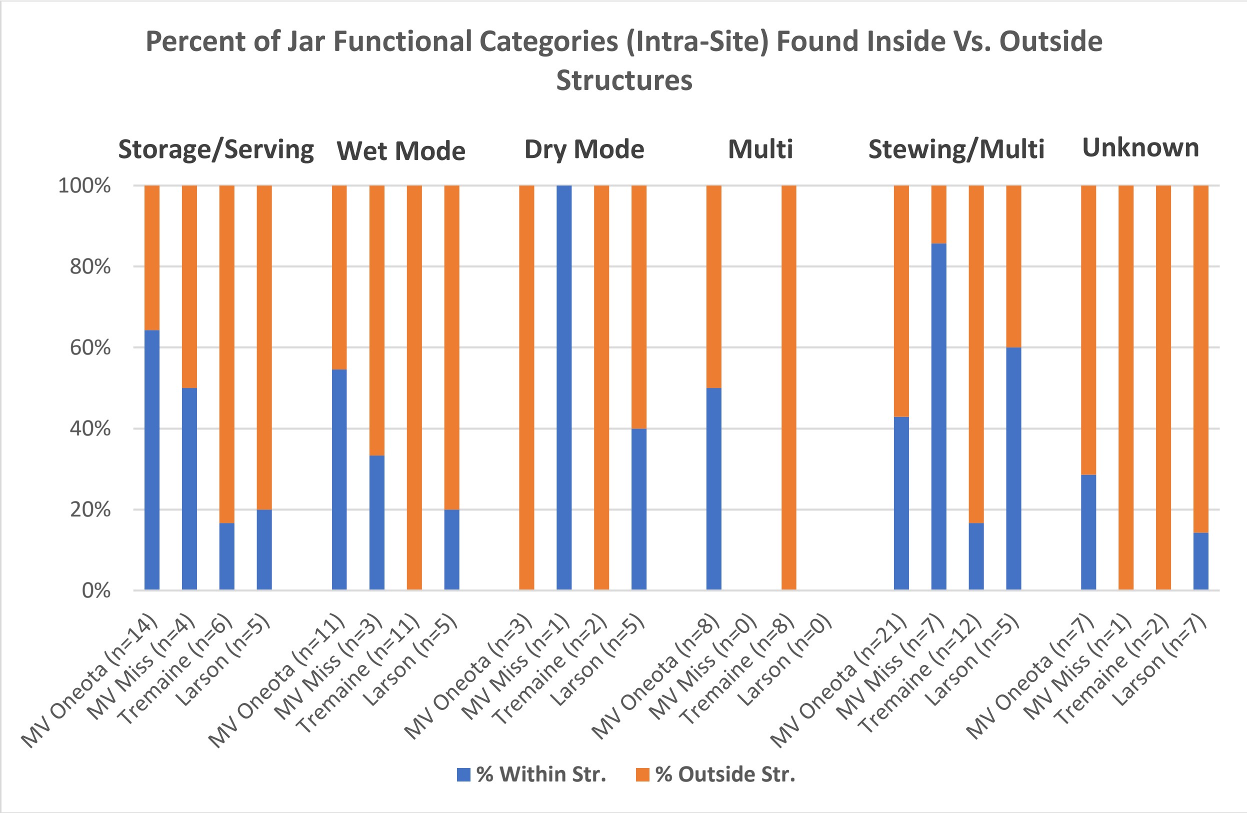

Figure 7.15. Percent of jar functional categories found inside or outside of structures, at the intra-site level.

Variations with the comparative sites were also apparent. As with the spatial analyses above, both Morton Village sub-assemblages appear to have different distributions compared to the Tremaine Complex, where the vast majority of jars were found outside. Some differences with Larson also exist, such as among the distributions of storage or serving jars, but there are fewer variations than compared to the Tremaine Complex. Overall, none of the jar assemblages had functional category distributions that closely matched each other, instead each varied in where different vessel function categories were found most.

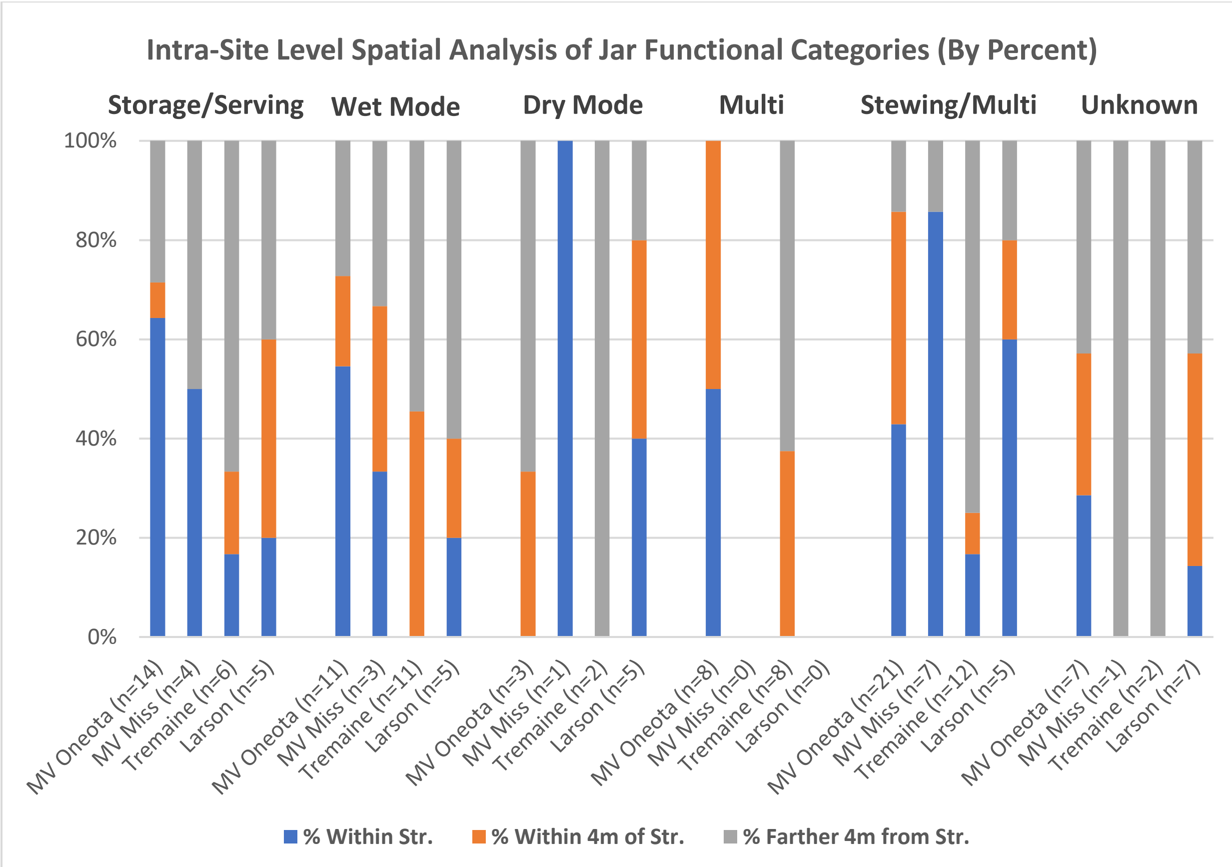

Figure 7.16. Distribution of jar functional categories at the intra-site level.

When distributions were divided further, more spatial variations were found (Figure 7.16). As seen in the previous analysis, Oneota-style jars used for serving and storage (n = 14) were found primarily within structures. 64.29% of serving and storage jars were found within such contexts, while 7.14% were found within four meters of a structure and 28.57% were found farther than four meters away. A similar pattern is found with Mississippian-style storage and serving jars, except that they were more evenly distributed. Among the four Mississippian-style jars used for serving and storage, 50% were found within structures and 50% were found farther than four meters away from a structure; none were found outside but near a structure. Jars used for wet mode cooking shared a similar distribution, with Oneota-style wet mode jars (n = 11) found primarily inside structures and Mississippian-style wet mode jars (n = 3) evenly distributed between the three spatial zones.

Unlike the above cooking techniques, different distributions were present within the jars used for stewing/multi-purpose uses. Within the Oneota-style sub-assemblage, stewing/multi-purpose jars (n = 21) were found in both interior and exterior contexts, with 42.86% originating from inside a structure, 42.86% from within four meters of one, and only 14.29% from farther away. Mississippian-style stewing/multi-purpose jars (n = 7) were found almost entirely inside structures, with 85.71% found in such contexts. Only one Mississippian-style stewing/multi-purpose jar was found outside of a structure. As this cooking technique had the largest sample size in both jar sub-assemblages, these ratios are more likely to indicate a slight difference between the stylistic groups in where this cooking technique was used.

Due to small sample sizes, information regarding the distributions of dry mode, multi-purpose, and jars with unknown functions is less clear. Mississippian- and Oneota-style jars used for dry mode cooking do have opposite distribution patterns at Morton Village but are only represented by four jars total, making inferences derived from these patterns questionable. For the Oneota-style dry mode jars (n = 3), all of them were found outside of structures, with 33.33% found within four meters of a structure and 66.67% found farther than four meters away. The only Mississippian-style dry mode jar with detailed provenience information was found within a structure. Regarding the use of jars for multi-purpose uses, only Oneota-style jars were used in such a way; no Mississippian-style jars were used as clear multi-purpose tools at Morton Village. Within the Oneota-style multi-purpose jars (n = 8), half were found within structures while the other half were found within four meters of a structure, none were found farther than four meters away. Comparisons of the distributions of jars of unknown functions were again complicated by a lack of Mississippian-style observations. Oneota-style jars with unknown functions (n = 7) were spread throughout the site, with the highest number found in contexts farther than four meters from a structure. Only one Mississippian-style jar with an unknown function had detailed provenience information, and was located farther than four meters from any structure.

When compared to Larson and the Tremaine Complex, these distributions generally differ in the same ways seen at the site level. Both Oneota- and Mississippian-style jars at Morton Village are found more frequently inside of structures compared to the Tremaine Complex, where most jars were found in open areas away from buildings. For example, among multi-purpose jars, half of the Oneota-style jars were found within structures while none were found within a structure at the Tremaine Complex. At Tremaine, 62.5% of such jars were found out in open areas, while none of the Oneota-style multi-purpose jars at Morton Village were found in such contexts. At Larson, jars were more evenly distributed throughout the site, and certain vessel function types, such as storage/serving and wet mode cooking, were more frequently found outside in areas farther than four meters from a structure compared to Oneota- and Mississippian-style jars at Morton Village. That being said, Mississippian-style jars do compare more closely to the distributions at Larson, as both set of jars are more evenly distributed and have no multi-purpose jars. Oneota-style jars are more frequently found within interior contexts compared to Larson.

Following the parameters of the site level analysis above, bowl and plate data were lumped into "serving/storage" and "cooking" categories to account for the small sample sizes present for individual cooking techniques. For both Mississippian- and Oneota-style bowls, vessels used for serving/storage were found both inside and outside of structures. Overall, 33.33% of Mississippian-style serving/storage bowls (n = 3) were found inside structures and

66.67% were found outside. When outside contexts are divided further, one Mississippian-style serving/storage bowl (33.33% of the total sample) was found within four meters of a structure and one (33.33%) was found farther than four meters away. Among Oneota-style serving/storage bowls (n = 15), 46.67% were found inside a structure and 53.33% outside. Outside of structures, 13.33% of the total Oneota-style serving/storage bowl assemblage was found within four meters of a structure and 40% was found farther than four meters away.

Interestingly, there are some disparities in where cooking bowls were located. In general, Mississippian-style bowls used for cooking had the same distribution as seen with serving/storage bowls, except that they tend to cluster more around structures. Among Mississippian-style cooking bowls (n = 6), 33.33% were found within structures, while 66.67% were found outside. Of those found outside, 50% of the cooking bowl assemblage was found within four meters of a structure, while only 16.67% were found farther than four meters away, indicating that cooking in Mississippian-style bowls tended to occur near the home. Oneota-style bowls used for cooking (n = 10) possess a different distribution. Among those used for cooking, only 10% were found in structures and 90% were found outside. When exterior contexts were divided further, only one cooking bowl, or 10% of the total cooking bowl assemblage, was found within four meters of a structure, while 80% of cooking bowls were found farther than four meters away. This pattern suggests that most cooking in Oneota-style bowls may have occurred in open, more communal areas, a clear preference not visible among other bowls. While these samples are still small, these variations in distribution may indicate differences in how cooking bowls were used at Morton Village.

There are also some possible differences present when the two Morton Village bowl sub-assemblages are compared to Larson. At Larson, serving/storage bowls (n = 5) are entirely found outside, with 60% found near structures and 40% found in open areas farther than four meters away from one. This distribution is different from both Oneota- and Mississippian-style serving/storage bowls at Morton Village, where both were found in interior and outdoor contexts. There is also a distributional difference present in where Mississippian-style cooking bowls at Morton Village and cooking bowls at Larson were found. At Larson, the majority of cooking bowls (n = 10) were found farther than four meters from any structure, similar to the patterns seen among the Oneota-style cooking bowls at Morton Village. Mississippian-style cooking bowls at Morton Village, on the other hand, were found concentrated within and nearby structures.

Variations were also found between the three assemblages when data on plates were examined. At Morton Village, the distribution of plates used for serving/storage is nearly identical between the Mississippian- and Oneota-style vessels (n = 23 and 4 respectively). Within both sub-assemblages, about 50% of serving/storage plates were found inside and 50% were found outside. When exterior contexts are divided, about 25% of serving/storage plates in both sub-assemblages were found within four meters of a structure and 25% were found farther than four meters away. Plates used for cooking were also relatively well distributed, but the majority of cooking plates in both sub-assemblages were found outside. Within the Mississippian-style cooking plates (n = 4), 25% were found within structures and 75% were found outside of one. Upon dividing exterior spaces further, the largest percentage of plates, 50% of all cooking plates, were found within four meters of a structure, while 25% were found in open areas farther than four meters from a structure. For the Oneota-style cooking plates (n = 6), 33.33% were found within structures and 66.67% were found outside. Interestingly, when exterior contexts are divided further, the largest percentage of Oneota-style plates used for cooking (50% of the total) were found in open areas farther than four meters from a structure, while only 16.67% were found within four meters of a structure. This peak is different from the one seen among Mississippian-style plates used for cooking, where cooking plates were found closer to structures.

At Larson, the distribution of different types of plates varied from both Morton Village sub-assemblages. Serving/storage plates at Larson (n = 17) were found most frequently outside, with 29.41% found in structures and 70.59% outside. Further investigations of exterior patterning found that the highest percentage of serving/storage plates, 41.18%, were found in open areas farther than four meters from a structure, while only 29.41% were found nearby structures. This pattern is the opposite of what was seen at Morton Village, where about half of serving/storage plates within both sub-assemblages were found in interior contexts. Among cooking plates from Larson (n = 4), 50% were found within structures, more than was found within the Morton Village sub-assemblages.

Summary of Vessel Function Spatial Analyses

Small sample sizes hampered analyses of the spatial distribution of different vessel function categories, limiting the inferential potential of the data. Despite sample size biases, it is clear that the various vessel function categories were distributed throughout the three spatial zones at each site; few cooking techniques and other use categories were used only in restricted areas of the sites, except possibly at the Tremaine Complex. Instead, different cooking techniques were used throughout each site, in many different contexts. This conclusion was true within each assemblage and within each vessel type examined.

While used in many areas, there are differences in the distribution of different vessel function categories between the sites, at both the site and intra-site level. In general, distributional variations between sites was the norm, as no sites or assemblages matched closely to each other. The largest distributional differences occurred between the Tremaine Complex and the other sites at both the site and intra-site level. At the Tremaine Complex, most activities appear to have occurred in open areas well away from structures, while the location of cooking and other activities at Morton Village and Larson were more varied and included both interior and exterior contexts. These differences are possibly due to variations in foodways practices between the Tremaine Complex and the other two sites, which was discussed above.

Spatial distributions at the site level at Morton Village also vary from the other two sites in interesting ways. At Morton Village, storage/serving vessels among jars, bowls, and plates were consistently found more frequently within structures than compared to Larson and the Tremaine Complex, where they were commonly found outside. This may suggest that storage and serving practices at Morton Village were different from those at the other two sites, or that these vessels were disposed of differently. The distribution of plates also differs further between Morton Village and Larson. At Morton Village, plates used for serving or storage were more frequently found inside structures while plates used for cooking were found outside in open areas. The opposite pattern is found at Larson, where plates used for cooking are found more frequently in structures and plates used for serving/storage were found outside. This suggests that while plate functions between the sites were similar, where plates were used for certain tasks were different. One other major variation was the distribution of jars used for wet mode cooking, which were found more frequently within structures at Morton Village compared to the other sites. Such a distribution suggests that not only storage and serving practices, but also some cooking practices occurred in different areas at each site.

Although complicated by small sample sizes, there are also possible differences present in the distribution of vessel function categories between Mississippian-style and Oneota-style vessels at Morton Village. For example, the distribution of jars used for stewing/multi-purpose uses was focused almost entirely within structures among Mississippian-style jars, but was more widespread through both interior and exterior contexts among Oneota-style jars. Bowls used for cooking were also distributed differently between the two stylistic groups.

Overall, differences in distributions indicate that there were only a limited number of spatial patterns of vessel use that were shared between the sites, suggesting that some foodways practices varied. Not only was the Tremaine Complex different from the other two sites, possibly because of its different social structure, but Morton Village and Larson, which possessed similar distributions in the vessel type spatial analysis above, also differed once vessel function was taken into account. Within Morton Village, some similarities and differences were also present between the stylistic sub-groups, as well as between Mississippian- and Oneota-style vessels and the comparative sites. All of this data suggests that residents of Morton Village, both Mississippian and Oneota, may not have been following previous foodways traditions regarding where cooking and other practices were occurring. As such, residents may have been making changes to their foodways patterns. Although this may have been the case, it is also apparent that different styles of pottery at the site were not used the same way in every space, suggesting that migrants and locals may have had different preferences for where certain vessel use activities were to occur. While it is possible that foodways practices were shifting at Morton Village, it is unclear if these behaviors were the result of hybridization or other processes. Interpreting this complex data is even more difficult as sample biases, trash disposal practices, and the effects of different formation processes also likely impacted the distributions of vessels being considered here. More research is needed to determine what these patterns may represent.

Summary

In this chapter, I presented the results of spatial analyses of different vessel types and vessel function categories present at Morton Village, Larson, and the Tremaine Complex, which were conducted to address Research Question 3. In general, the results indicate that different vessel types and functional categories were used throughout each site, with few indications of a restricted spatial pattern for how vessels were used. Distributional patterns between the sites and between the stylistic sub-assemblages at Morton Village also varied. While distributional patterns at the Tremaine Complex varied the most from the other assemblages, differences were present between each assemblage considered; no two sites or assemblages shared matching distributional patterns. Ultimately, spatial patterning at each site was likely impacted by issues such as small samples sizes, re-use and trash disposal practices, and different formation processes, limiting the inferential potential of this analysis.

While recognizing the issues that limit the spatial data presented here, patterns do suggest that some foodways practices were different between the three sites. At the Tremaine Complex, cooking and other foodways practices appear to have occurred primarily in open areas between longhouses, while foodways practices at Morton Village and Larson took place in a wider variety of locations. This major difference may be due to variations in social structure, as evidenced by the use of longhouses, between the Tremaine Complex and the other two sites. Despite similar distributions of vessel types, differences between Morton Village and Larson were also visible when vessel function was considered. These differences, along with variations between the stylistic sub-samples at Morton Village and the comparative sites, suggest that residents at Morton Village were not trying to continue traditional foodways patterns and signal social boundaries, but may have been changing their behaviors, leading to the creation of a foodways pattern unique to Morton Village. While this overall pattern was unique, migrants and locals still appear to have possessed some different preferences related to cooking and vessel use. Distributional patterns at Morton Village also suggest that the use of new vessel types or functional categories were not restricted to certain contexts, such as open public areas, but were used throughout the site. This pattern may indicate that the new vessel types and vessel use patterns adopted by the residents of the site were not only used in community events, but had also been incorporated into everyday domestic practices. Combined, the unique spatial distribution at Morton Village and the unrestricted use of adopted vessel types may be further evidence of hybridization at Morton Village, but more research is required to strengthen this argument. In the next chapter, Chapter 8, I will combine the results from the last two chapters to gain a greater understanding of the coalescence process at Morton Village and to argue for an expansion of the approaches used to investigate coalescence.

CHAPTER 8:

DISCUSSION AND CONCLUSION

In this dissertation, I have sought to explore how everyday interactions and mundane behaviors can contribute to coalescence and the development of new communities and identities. While scholars (e.g. Birch 2013) recognize that researchers should attempt to tack between multiple scales of analysis to better explore cases of coalescence, past research (Birch 2013; Clark et al. 2019; Kowalewski 2006), has given primacy to the development of new institutions and ideologies, which would have brought people together through shared practice. While undoubtedly important to the process of forging new communities, the analysis of daily choices and interactions, which can work at different scales to build new relationships, create new shared traditions, and empower individuals in contributing to a new social environment (Yaeger and Canuto 2000), has been under-developed. In order to examine these everyday processes, I focused on foodways, particularly cooking and vessel use, as these are essential everyday behaviors that are also socially and culturally powerful (Hastorf 2017; Twiss 2012).

To examine the relationship between foodways and coalescence, I conducted ceramic analyses to find evidence of the hybridization of food practices. When people from different backgrounds come together, such as during coalescence, a potential for adaptation and innovation is created as individuals grapple with new ideas, new practices, and the challenges created by an influx of people (Alt 2018; Birch 2013). In these situations, negotiations of difference occur that alleviate some of the stresses inherent in these spaces. Such negotiations can lead to hybridization as ideas, beliefs, and practices are borrowed and adapted. Innovation and the development of entirely new practices and social forms is also possible (Liebmann

2015). Through hybridization and innovation, people of different backgrounds can create shared practices, traditions, and institutions that are able to bring people together, creating a sense of community and a common identity (Alt 2018).

Food, although a commonplace item, can play a critical role in the hybridization process. Food is inherently social, as it is often shared with other people and can serve as a primary symbol of different identities (Rodriguez-Alegria and Graff 2012; Twiss 2012). The act of eating together is also a way to build or maintain relationships and create shared traditions at multiple scales, from individual families to entire communities. Due to this social role, food can serve as a critical locus of interaction and negotiation between people (Jaffe et al. 2017; Rodriguez-Alegria 2005; Stein 2012; Weller and Turkon 2015). Through negotiations and hybridization involving food, the development of new tastes, common cuisines, and shared traditions of commensality may have helped to link groups together and aid the growth of new community identities within the coalescence process.

My case study for this research is the Morton Village site, located in the central Illinois River valley, which was occupied contemporaneously by both local Mississippian and migrant Oneota groups (Bengtson and O'Gorman 2016; Santure et al. 1990). At the site, I conducted ceramic use-wear and spatial analyses to explore different cooking and vessel use practices. I compared these data to two comparative sites, Larson and the Tremaine Complex, which provide examples of Mississippian and Oneota cooking traditions that may have been present prior to the migration of Oneota groups into the CIRV. By comparing patterns of ceramic function between these sites, I sought to uncover evidence of changing foodways and hybridization at Morton Village. If migrants and locals were seeking to maintain past traditions of cooking and vessel use, then it is likely that food did not play a major role in coalescence at the site. If changes were occurring and residents of Morton Village were creating shared patterns of cooking and vessel use, then foodways may have played a role in bringing the community together.

Results of Use-wear and Spatial Analyses

In total, 349 vessels from the three sites were analyzed for this dissertation. This data set included 215 vessels from Morton Village (19 jars, nine bowls, and 31 plates are Mississippian-style; 68 jars, 28 bowls, and 11 plates are Oneota-style; and seven jars, 39 bowls, and three plates were indeterminate), 81 vessels from Larson (36 jars, 18 bowls, and 27 plates), and 53 vessels from the Tremaine Complex (all jars). While the different vessels included in these samples are generally similar in shape, morphological analyses did find differences in vessel shape between the sites that have implications for understanding vessel function.

One of the most visible morphological differences was variation in jar vessel size. Jars at the Tremaine Complex had significantly larger estimated rim diameters and more horizontally angled shoulders compared to the Morton Village sub-samples and Larson, creating jars that were larger, squatter, and likely had larger vessel capacities. Jars at Larson and Morton Village are smaller, suggesting that differences existed in the organization of cooking and consumption between the Tremaine Complex and these sites. Since households at the Tremaine Complex were likely organized differently than at the other two sites, emphasizing more communal behaviors, jars may have been made larger to accommodate cooking for larger groups of people. While not related directly to morphology, the lack of bowls and plates at the Tremaine Complex further indicate variations in foodways practices, possibly related to the presentation and consumption of food.

Aside from jars, morphological differences also existed among plates from Morton Village and Larson. At Morton Village, both Mississippian- and Oneota-style plates had longer and taller rims and higher rim angles than plates from Larson, creating plates that had a more bowl-like shape. Rim angle data from Mississippian-style plates at Morton Village also demonstrate that these plates may have been purposefully made in two slightly different shapes: plates that were flatter and plates that were more bowl-like. These different shapes, not present in Oneota-style plates or those from Larson, may indicate that Mississippian-style plates were made with multiple intended functions in mind.

Other small variations in morphology were also present between the assemblages, but these may relate to variations in technological style (e.g. Hegmon et al. 2000) and not vessel function. Interestingly, vessels from Morton Village often possessed traits that were in-between those seen at Larson and the Tremaine Complex. Some vessel traits at Morton Village were also closer in shape and design to those at Larson, possibly signifying that some aspects of technological style were shared at the two sites. This may be partially explained by the closer social relations between those two sites, as it is possible that some residents of Morton Village were direct ancestors of those who lived at Larson.

Site level Use-Wear Analyses (Research Question 1)

At Morton Village, use-alteration analyses demonstrated that jars were used in a variety of ways, with stewing/multi-purpose cooking being the most common. Bowls at the site were used equally for storage/serving and cooking, while plates were used primarily for serving or storage. Interestingly, about a quarter of the plates were also used for cooking or other purposes that involved exposure to fire. Further variations in function were visible when vessel shape was examined. At Morton Village, plates appear to have been manufactured in two shapes, flatter and more bowl-like, which were used in slightly different ways. Flatter plates at the site were primarily used for serving/storage, while the more bowl-like plates were used equally for serving/storage and cooking.

At the comparative sites, similar use-alteration results were found. At Larson, jars were used for a number of tasks, with the most common being dry mode cooking, stewing/multi-purpose cooking, and unknown functions. Bowls were used equally for storage/serving and cooking, while plates were used primarily for serving or storage. Different plate shapes were not readily apparent at Larson. At the Tremaine Complex, jars were the only vessel type present in large numbers. Like at the other sites, jars at the Tremaine Complex were used in a number of different ways, with wet mode cooking the most prevalent type of function.

Comparisons of these data between the sites demonstrate that the same types of cooking techniques were used at each site, but in different proportions. Among jars, the primary cooking vessel at each site, wet mode cooking was preferred at the Tremaine Complex over other cooking types, while lower rates were present at Morton Village and Larson. As households at the Tremaine Complex were likely organized differently, emphasizing communal action, wet mode cooking may have been an easier and more efficient method to use when cooking greater amounts of food for larger groups. At Larson, dry mode cooking was more prevalent. Cooks at Larson also preferred to utilize pots in a specialized fashion, as a limited number of jars were used as multi-purpose or stewing/multi-purpose vessels compared to the other two sites. At Morton Village, more jars appear to have been used for storage or serving, especially smaller jars. This pattern may indicate that not only did cooking patterns differ, but that residents at Morton Village may have also relied on different storage and serving practices. Finally, a much higher proportion of jars at Larson had unknown functions, which may be a result of the higher rate of dry mode cooking at the site or signal that jars at Larson were being used more frequently in a way that is less documented at the other sites. Fisher's Exact comparisons of these data determined that patterns of jar use were significantly different between Larson and the Tremaine Complex and between Morton Village and Larson, while Morton Village and the Tremaine Complex were statistically similar.

While jar use may have been similar between Morton Village and the Tremaine Complex, the presence of bowls and plates at Morton Village and Larson indicate that they also shared some foodways behaviors. At both Morton Village and Larson, bowl use was similar, with about half used for storage/serving and the other half used for cooking. While their functions were comparable, bowl sizes were used differently. At Larson, small bowls were used more frequently for storage/serving and larger bowls were used for cooking, while different sized bowls at Morton Village were all used in the same ways. Like bowls, plate function also was similar between the sites, with most plates used for serving or storage. Despite this similarity, the functions of different plate sizes and shapes did differ between the sites. At Morton Village, smaller-sized plates were more frequently used for cooking while larger plates were primarily serving or storage vessels. At Larson, the opposite pattern was present. Two slightly different shapes were also present at Morton Village, with flatter plates used more frequently for serving or storage and more bowl-like plates used for cooking and serving/storage at similar rates. No clear variations in plate shape were present at Larson.

Overall, both similarities and differences in vessel function were present between the sites, with no two sites sharing the same vessel use pattern. Differences between Morton Village and comparative sites indicate that residents of Morton Village may not have been strictly adhering to past cooking, storage, and serving practices, but instead may have been developing their own preferred foodways patterns.

Intra-Site level Use-Wear Analyses (Research Question 2)

After the completion of the site level use-wear analyses, the Morton Village assemblage was divided into Mississippian- and Oneota-style sub-assemblages in order to compare patterns of vessel function within the Morton Village site. Among Mississippian-style vessels, jars were used for a variety of purposes, with stewing/multi-purpose cooking the most frequent. Interestingly, no Mississippian-style jars were used as distinct multi-purpose tools. About two-thirds of Mississippian-style bowls were used for cooking, while only one-third were used for storage or serving. Unlike bowls, Mississippian-style plates were used primarily for serving or storage, but were found in two different forms based on differences in rim angle. Flatter bowls were used almost exclusively for serving or storage, while more bowl-like plates were used for both cooking and serving or storage, with cooking more frequent.

As with the Mississippian-style jars at Morton Village, the Oneota-style jars were also used for a number of cooking tasks, with stewing/multi-purpose cooking the most frequent. Oneota-style bowls were used for both cooking and storage or serving at nearly equal rates, but a serving or storage function was slightly more frequent. Oneota-style plates were used like bowls, with about half of the plates used for serving or storage and the other half used for cooking. While small sample sizes may be a factor, plate sizes do appear to have an impact on function. Among the Oneota-style plates, small plates were used entirely for cooking, medium plates for both cooking and serving or storage, and large plates were used entirely for serving or storage.

No variations based on rim angle are present among the Oneota-style plates, as most are more bowl-like in shape.

When these data were compared among the samples, both similarities and differences were found. Among jars, preferred cooking techniques often varied. At the Tremaine Complex, wet mode cooking was predominant, possibly for the reason stated above, while vessels used for dry mode cooking exclusively were more common at Larson and in the Mississippian-style assemblage from Morton Village. The use of jars as distinct multi-purpose tools was also common at the Tremaine Complex and among Oneota-style jars at Morton Village, but was very limited within the Larson and Morton Village Mississippian-style assemblages. The use of stewing/multi-purpose cooking was also the highest among Mississippian-style vessels from Morton Village. The results of Fisher's Exact comparisons of these data indicate that, while variations existed, the vessel use patterns between the two Morton Village sub-assemblages were statistically similar. Assemblages from the same archaeological traditions, such as Larson and Mississippian-style jars from Morton Village, also were found to be statistically similar. The primary differences, according to Fisher's Exact tests, were found in cross-tradition comparisons, between Larson and Oneota-style jars at Morton Village for example, showing that some differences between the sites may be related to the continuation of traditional cooking and vessel use practices.

Comparisons of bowl function were less varied. In general, bowl function within the three assemblages was similar, with about half of the bowls used for cooking and the other half for storage or serving. Comparisons using Fisher's Exact tests confirmed this trend, finding no significant differences in bowl function between the three groups. While overall function did not differ greatly, bowl sizes were used differently at Larson compared to Morton Village. At

Morton Village, bowl size classes for both Oneota- and Mississippian-style bowls were used in the same way, about half for cooking and half for serving or storage. This pattern was not apparent at Larson, where most small bowls were used for serving or storage and most large bowls were used for cooking. Aside from these differences, it is important to remember that the bowl vessel form was not used at the Tremaine Complex, so the adoption and use of Oneota-style bowls at Morton Village in itself is a clear shift in practices from the Oneota Tradition comparative site.

One of the largest differences in vessel use involved plates. Among the three assemblages, the function of Mississippian-style plates at Morton Village and Larson were nearly identical, with about 80% of plates used as serving or storage vessels. Oneota-style plates at Morton Village were used in a more flexible pattern, comparable to bowls, with about half being used for cooking and half for serving or storage. Fisher’s Exact tests comparing these patterns found that the function of plates among the two Mississippian-style assemblages differed significantly from the Oneota-style plates at Morton Village. Interestingly, while the Larson and Morton Village Mississippian plates had nearly identical patterns of use, the Mississippian-style plates from Morton Village possessed more variation in terms of plate shape based on rim angle measurements. Only the Mississippian-style plates from Morton Village appear to have clustered into two vessel forms, plates that were flatter and plates that were more bowl-like, which, as discussed above, appear to have had slightly different functions. Again, it must be noted that the presence alone of Oneota-style plates at Morton Village, which are not present at the Tremaine Complex or the vast majority of other Oneota sites, documents a distinct shift in foodways practices from that comparative site.

Combined, these use-wear data indicate that both continuity and change were present in foodways practices at Morton Village. One of the most visible patterns that suggest continuity is the pattern of flexible vessel use found among the Oneota-style vessels at Morton Village and the Oneota Tremaine Complex. At both sites, vessels were used for a wide variety of purposes, and many were used as multi-purpose tools that appear to have filled multiple functions during their use-lives. This pattern is even visible among the bowl and plate forms adopted by Oneota potters and cooks at Morton Village. While these vessels were likely used for some cooking and food presentation practices common to their Mississippian neighbors, users of Oneota-style vessels at Morton Village also appear to have fit these vessels into that tradition of flexible vessel use. This pattern is not seen among the Mississippian-style vessels at Morton Village and Larson, who appear to have utilized a more specialized pattern of vessel use. Very few vessels, excepting possibly stewing/multi-purpose jars, were used as multi-purpose tools. There is also an apparent emphasis on dry mode cooking at Larson and in the Mississippian-style vessels at Morton Village that is more limited among the Oneota-style assemblages, and may suggest the continuation of some cooking preferences among users of that style of vessel at Morton Village.

While continuity was present, so were changes. The most visible change present at Morton Village was the adoption of Oneota-style bowls and plates, which are not present at the Tremaine Complex or the majority of other Oneota sites. The adoption of these vessel indicates that the potters and cooks were trying to incorporate local practices regarding food presentation and consumption, and may have been using these vessels to engage in larger events within the community. Cooking preferences also appear to have changed slightly at Morton Village. Among the Oneota-style jars at Morton Village, there is a notable decrease in the use of wet mode cooking, which was the dominant cooking type at the Tremaine Complex but not as prevalent among the Mississippian-style assemblages. While speculative, this may relate to differences in household organization between the sites. The use of stewing/multi-purpose cooking among Mississippian-style jars at Morton Village was also much higher than among any other assemblage and may also signal that changes in cooking preferences were occurring. These changes suggest that the hybridization of cooking and foodways patterns was likely on-going during the occupation of Morton Village.

Site and Intra-Site Level Spatial Analyses (Research Question 3)

Vessel Type Spatial Analyses

In general, at both the site and intra-site level, all vessel types at each site were found in all three spatial categories; no vessels had restricted distributions. While vessels were dispersed widely, there were variations between the sites in where some vessels were found more frequently, primarily among jars. At the Tremaine Complex, jars were primarily found outside, in open areas between structures. Less than 10% of jars were found within structures. At Morton Village and Larson, vessels were found more evenly divided between inside and outside contexts. The differences between the Tremaine Complex and the other two sites were further confirmed by a Fisher's Exact test, which found significant differences in the distributions between the sites. Unlike jars, distributions of bowls and plates at Morton Village and Larson were generally similar, including the recovery of both types of vessels in interior and exterior contexts. Few differences were also found between the distributions of all three vessel types among the Morton Village stylistic sub-assemblages, which both generally aligned with spatial patterns at Larson.

Overall, these data indicate that the spatial organization of cooking and vessel use at the Tremaine Complex was different from Morton Village and Larson. While patterns at the Tremaine Complex may be the result of different formation processes, as houses at the Tremaine Complex generally lack living surfaces (O'Gorman 1995), it is also possible that more cooking and foodways practices occurred outside at the Tremaine Complex. Based on the presence of longhouses, it is likely that the Tremaine Complex community, and the households within it, were organized differently than at the other two sites (Brown 1970; O'Gorman 2010). Larger jar sizes at the Tremaine Complex also suggest that cooking was performed for a greater number of people than at Morton Village or Larson. Due to the more communal nature of various activities and foodways at the site, cooking and other events may have occurred outside more frequently. As spatial patterns at Morton Village match more closely with Larson, residents at the site likely partook in practices similar to local traditions in the CIRV. This would have included all residents, both migrant and local, as both Mississippian- and Oneota-style vessels at the site were distributed similarly. Distributions also indicate that Oneota-style vessels were used in both public and private contexts, indicating that newly adopted vessel types and practices were not only emphasized in public contexts, but were being incorporated into everyday contexts as well, slowly creating a common foodways pattern at the site.

Vessel Function Spatial Analyses

While small sample sizes hampered spatial analyses related to vessel function, it is apparent that most vessel function categories were distributed throughout all three spatial zones; there is little evidence for the spatially restricted use of a functional category. The distributions associated with different functional categories also varied between each site, at both the site and intra-site levels. In general, variation was the norm. Once again, the largest differences were between the Tremaine Complex and the other two sites, as most activities at Tremaine appear to have occurred in open areas well away from structures. These differences may be due to the same processes discussed above, which include variations in community and household structure along with the impacts of different formation processes.

Variations in the distribution of different functional categories were also present at Morton Village. Among all vessel types, storage and serving vessels at Morton Village were found more frequently within structures compared to the other sites. This pattern may indicate that storage and serving practices, or the ways in which those vessels were disposed, differed at Morton Village. Disparities in plates were also present between Morton Village and Larson. In general, more serving or storage plates were found inside structures at Morton Village, while a larger number of plates used for cooking were found outside in open areas. The opposite pattern is present at Larson, where most plates used for serving or storage were found outside. While plate function was similar between the two sites, where those tasks occurred may have differed. The spatial distributions of some cooking techniques also varied between the sites. For example, wet mode cooking in jars at Morton Village tended to occur within structures, while it was more common outside of structures at Larson and the Tremaine Complex. At the intra-site level, distributions also varied between the stylistic sub-assemblages at Morton Village, including the distributions of jars used for stewing/multi-purpose cooking and bowls used for cooking.

Overall, there were differences between all assemblages and few distributional patterns were shared. These disparities suggest that some foodways practices varied between all three sites. There are also similarities and differences present within the Morton Village sub-assemblages and between the sub-assemblages and the comparative sites, so there is little evidence that past traditions of vessel use were being strictly followed at Morton Village. Residents at the site may have been making changes to their foodways patterns, but differences between the stylistic sub-assemblages also suggest that migrants and locals still possessed different preferences as well. These complex patterns may have been a result of on-going hybridization at the site, but sample biases, trash disposal practices, and the effects of formation processes complicate this interpretation. Combined with the evidence from vessel type spatial analyses, changes in foodways are apparent at Morton Village when compared to the other sites. It also appears that newly adopted vessel types were being incorporated into everyday domestic practices, not just public settings, possibly providing further evidence of the hybridization of foodways at the site.

Implications of Results for Coalescence at Morton Village and Beyond

When examined together, the evidence presented above indicates that a complex pattern of continuity and change in foodways practices was present at Morton Village. It appears that residents were still using some traditional behaviors that they shared with the comparative sites, such as a more flexible (Oneota-style) or specialized (Mississippian-style) pattern of vessel use, but changes in foodways had also occurred, including subtle shifts in preferred cooking techniques and the adoption of bowls and plates by Oneota potters and cooks. While some traditional behaviors may have been continued, it does not appear that residents were clearly trying to maintain separate food traditions. Instead, they appear to have been sharing and incorporating aspects of each other’s practices. These alterations shaped foodways practices at Morton Village, creating a cuisine that was unique to the site.

The on-going development of this shared Morton Village cuisine may have been the result of both organic and intentional hybridization. While some shifts in cooking practices could have been intentional, it is more likely that these changes occurred organically, as residents at the site interacted and shared. Close contact would have regularly exposed residents to different ways of cooking and different tastes during their everyday lives, especially if food sharing at everyday meals or larger community events was a common practice. Such interactions might have led to slow changes in taste and cooking preferences, over time generating a shared cuisine in the community.

On the other hand, the adoption and use of bowls and plates by Oneota residents at the site may be evidence of intentional hybridization. The adoption of these vessel types may have been a conscious choice that enabled the migrants living at Morton Village to take part in local food presentation and sharing practices at larger supra-family and community events. Participation in such events would have helped migrant and local residents to build solidarity and create shared traditions. It may have also served as one avenue through which migrants could actively partake in local social and political competitions, incorporating them into the political dynamics of the region.

In both cases, the hybridization of foodways may have created a common ground through which people could interact and develop relationships on an everyday basis. The growth of a shared cuisine would have helped to create a sense of connection and shared experience between the residents of the site, and may have helped to establish common traditions. Since food is also a way to literally consume and embody identities and relationships, a shared Morton Village cuisine would have acted as a visible and powerful symbol of the new relationships being established at the site.

In previous research regarding diet and ethnicity using stable isotope data at Morton Village, Tubbs (2013) found similarly complex results that indicate the presence of multiple identities at Morton Village. While past Oneota and Mississippian identities may have still been important to residents in the CIRV, isotopic data suggest that those individuals buried in the Norris Farms #36 cemetery may have also situationally emphasized a Bold Counselor or community-based Morton Village identity, likely at events that would have involved both migrants and locals. This situational emphasis on different identities could alternatively explain the complex patterning of cooking and vessel use data at the site, in which traditional practices of foodways were used in private and shared practices were used in public at larger, supra-family events. While this pattern is possible, spatial analyses in this dissertation indicate that different cooking and vessel use practices, including the use of bowls and plates, were incorporated into both domestic and public contexts at Morton Village. It may have been that identities were not emphasized situationally, or that cooking did not play a large role in such displays. It is also possible that vessel disposal practices mask such a pattern, or that the organization of cooking and vessel use at the site was complex and does not fit neatly into a private-public model of space and social interaction. Other evidence, such as the general continuation of architectural and ceramic styles, further suggest that complex identity politics were occurring at the site as new relationships were established, demonstrating the need for continued research to further untangle the intricate processes of identity negotiation and coalescence occurring at Morton Village.

Recent research on botanical remains has helped to further clarify issues of diet and identity at Morton Village. In her dissertation, Nordine (2020) analyzed botanical remains from a sample of features associated with Oneota, Mississippian, or mixed material culture. These analyses found no major differences in the plant remains between the different contexts, except for slight differences in the use of nuts, suggesting that all residents at Morton Village utilized similar plant resources and may have worked cooperatively to gather and process foodstuffs. While more research is needed, particularly the inclusion of faunal data, these findings may indicate that local and migrant residents shared similar diets and may not have relied on the use of different plant taxa to signal identities. If this is the case, then it may have been changes in other foodways behaviors, such as cooking techniques and serving/consumption practices, and not diet that generated a unique cuisine at Morton Village, one that promoted integration and cohesion.

In either case, it is clear that foodways practices played a role in the coalescence process at Morton Village. The variations in cooking and other foodways practices documented in this dissertation were part of a larger process of creating a unique cuisine at Morton Village, one that could have served as the basis for new shared food traditions. The development of this unique cuisine involved everyday interactions between a number of people within Morton Village, both migrants and locals, helping to form a common ground from which new identities could be built. As such, foodways practices served as one basis for integration within the community, linking people together through shared tastes and practices and helping to create community at Morton Village. Although food played a role in coalescence, it is important to note that it was not the only factor in coalescence at the site. Ritual practices, social institutions, concerns for collective defense, and other influences also would have shaped on-going coalescence and the forging of community at Morton Village.

At a general level, this case study also demonstrates the importance of everyday interactions and foodways to understanding coalescence. This research highlights how everyday, mundane interactions help to establish social links and new community ties. In particular, these frequent interactions help promote the integration of different segments of the community, as they regularly bring people together, encourage the sharing of resources and ideas, and can cement new relationships through the development of common practices. As such, it is critical to consider multiple scales of analysis, including everyday practices and broader social institutions, to gain a greater understanding of the process of coalescence. Developments related to foodways and other everyday behaviors can help to promote integration as individuals and families share, learn from each other, and create new practices and traditions, but they may not be able to overcome some scalar stresses and other issues inherent in coalescent and post-migration situations, such as managing conflicts or political struggles. Broader social and political institutions may be required to help groups negotiate such conflicts. Therefore, one must consider community integration from a number of perspectives and different scales to gain a more complete understanding of the coalescence process.

Limitations of Study

This dissertation was hampered by a number of limitations, which may have impacted the results outlined above. Many of these limitations relate to the methodologies used to address the research problem. Ceramic use-alteration analyses, while effective for exploring vessel function, have a number of limitations due to sampling requirements and a need for further experimental research. In general, use-alteration analyses require large vessel sections to be able to interpret vessel function (Skibo 2013), greatly limiting the size of the sample that can be examined. These smaller sample sizes hindered statistical comparisons, as well as the spatial analyses conducted in Chapter 7. Currently, use-alteration patterns can also be difficult to interpret, leading me to lump many vessels into an “unknown” function category and further limiting the data available for comparison. Alongside the use-alteration analyses, the spatial analyses conducted for this dissertation were hindered by a number of factors, including different excavation sampling strategies and the presence of different formation processes.

This study was also limited by the scope of cooking investigated. Cooking is a varied and complex suite of behaviors, which can involve a number of tools and different cooking techniques (Graff 2018; Rodriguez-Alegria and Graff 2012). Limiting my examinations to ceramics reduced the number of cooking practices I could investigate and excluded other types of evidence whose inclusion may have uncovered further variations in cooking practices.

My reliance on pottery style as a proxy for ethnic groups in the Midwest may also be problematic, as the relationships between style and identity are complex (Croucher and Wynne-Jones 2006; Gosselain 2000). Further, assuming that Oneota cooks were the only individuals using Oneota-style pots may introduce bias into the study, but this is a necessary assumption as it is currently impossible to determine who may have used a specific vessel. Despite this, ceramic style is a major dimension of variability at Morton Village and should be taken into consideration during any ceramic analyses.

The fact that we do not know where the Oneota Bold Counselor migrants originated from also complicates issues of ceramic style and ethnicity. Ideally, ceramics from past sites connected to these migrants would have been examined to understand foodways traditions prior to their migration into the CIRV. Since this was impossible, I chose to use the Tremaine Complex as a comparative site because it was located within the heartland of the Oneota Tradition. The site had also been the focus of extensive excavations that had recovered a very large and well-provenienced sample of Oneota ceramics adequate for use-wear analysis. While they may share similar ceramic styles, it is possible that practices and tastes may have differed between the migrants and residents of the Tremaine Complex, as certain practices and the organization of cooking likely varied across the Oneota Tradition. Further, the Bold Counselor Oneota may have undergone other changes during the process of migration, such as shifts in social organization, which are undetectable without knowing their point of origin. These unknowns also complicate comparisons between Morton Village and other Oneota sites.

Contributions of Study

Despite its limitations, this study makes a number of contributions to our knowledge of precontact history in the CIRV and our understanding of the coalescence process. Through the examination of foodways, this dissertation provides new information about the social interactions occurring at Morton Village and in the CIRV during this time. It also further expands our knowledge of cooking practices and vessel function in the Midwest.

At a more general level, this research demonstrates the importance of foodways and other everyday practices to community integration, coalescence, and culture change. These different perspectives can be used to refine models of the coalescence process and explore case studies in new ways. It also re-iterates the importance of considering coalescence at multiple scales and through different perspectives, as it is likely that multiple developments were occurring at the same time to promote coalescence within a community. Further, this study continues to expand the utility of use-alteration analyses by answering larger social questions, instead of focusing on vessel function and technological change.

Future Research

This study could be enhanced through a number of additional research projects. At Morton Village, comparisons of use-wear between different architectural types at the site, such as wall trench versus single post, could further elucidate similarities and differences in foodways practices between Oneota and Mississippian groups living at the site. Such an analysis may also generate information regarding the ways in which mixed ceramic assemblages from one structure may relate to these practices. In addition to structures, comparisons of use-wear patterns between domestic contexts and special-use contexts, such as Structure 16 and Feature 224, may also reveal differences in cooking and vessel use in everyday and ceremonial foodways practices.

At a more general level, expanding the study to include other forms of cooking, such as earth ovens, alongside ceramics would provide more information regarding cooking and foodways at the sites and allow for a more in-depth exploration of the role of foodways within coalescence at Morton Village. Further ethnographic, ethnoarchaeological, and experimental research regarding cooking and ceramic use-alteration patterns could also aid in the interpretation of those patterns and, as a result, foodways behaviors, leading to a more robust examination of the data available for comparison.

Regarding the comparative sites, I think it would be helpful to expand the number of Oneota sites examined. Data sets from different Oneota sites across the region would aid in the exploration of variability within the tradition and would improve evaluations of the presence of changes in foodways behaviors at Morton Village.

It would also be informative to examine data from other Bold Counselor sites in the CIRV in order to generate a greater understanding of social interactions during this time period.

These data would enable multi-scalar analyses of social interaction and possibly coalescence in the region. Alongside foodways, other aspects of life should be considered during these analyses, such as ritual or community structure, to look at the interactions occurring during this time from different perspectives.

Conclusion

The goal of this dissertation was to explore how everyday interactions and behaviors contribute to coalescence and the development of community identity, focusing specifically on Morton Village in the CIRV. To investigate this issue, I conducted use-alteration and spatial analyses of ceramics from Morton Village and two comparative sites, which I then used to evaluate shifts in foodways practices at the site. These analyses found variations in cooking and foodways practices between Morton Village and the comparative sites, which suggests that foodways patterns may have been in the process of changing at Morton Village. I argue that these variations in foodways demonstrate that residents of the site were not attempting to maintain separate foodways patterns, and therefore separate identities, but may have been in the process of hybridizing their foodways to create a shared cuisine. This new, shared cuisine served as a common ground through which residents built relationships and a sense of commonality, helping to integrate different groups within the community. Based on these results, this study demonstrates that foodways practices and other everyday interactions formed critical components of the coalescence process alongside larger-scale developments, such as new social institutions. It also reiterates the need to consider multiple scales of analysis when examining coalescence, as no one scale of analysis or behavior will be able to generate a complete understanding of a particular case of coalescence; multiple perspectives are required.

APPENDICES

APPENDIX A

Vessel Metric Data

Table A.1. Morton Village (11F2) Jar Metric Data									
Oneota-Style									
Vessel #	**rim diameter (cm)**	**shoulder diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**shoulder angle (deg)**	**rim thickness (mm)**	**shoulder thickness (mm)**	**base thickness (mm)**
J-1	28		30.93	35.06	60.5	44.7	8.84	9.06	
J-2	28		36.26	36.99	67.4	36	10.29	8.95	
J-3	30		29.46	33.12	55.1	40.8	6.95	8.73	
J-5	26		33.94	35.64	64.8	31.4	7.98	9.13	
J-6	14	22	31.93	34.63	71.1	28.2	7.54	6.03	
J-7	21	32	33.49	33.52	73.8	39.3	7.74	7.87	
J-8	18		29.14	31.52	67.1	34.2	7.32	4.42	
J-10				23.63			7.09	6.49	
J-15	26	36	34.18	34.61	67.3	28.9	7.9	7.18	
J-19								6.53	
J-21	14		19.57	19.9	66.2	50.6	7.34	5.37	
J-22	15	23	26.51	25.65	72.4	36	5.92	5.05	3.36
J-23								8.05	
J-24							6.69	8.11	
J-25	29		33.01	36.7	44.8	47.1	9.21	8.41	
J-26	22	26	35.13	37.02	66.8	53.8	7.17	9.82	
J-27	24	36	34.97	38.72	54.1	32.3	8.12	7.93	
J-29	15		17.7	18.77	58.9	33.2	7.07	8.02	
J- 30	15		17.63	17.95	66.8	41.6	6.34	5.58	
J-31	34	45	34.1	37.21	59.2	42.9	7.29	5.4	
J-34	24	33	29.86	31.39	76	31.8	6.64	6.44	
J-36	10	12	16.16	16.32	51.3	44.7	5.13	4.63	
J-41	30		33.68	38.55	55.8	43.4	8.93	5.59	
J-46	26	35	31.2	38.22	48.7	38.9	9.1	7.54	
J-52								4.98	
J-59	29	38	48.92	42.25	70	45	8.05	6.97	
J-68	23	40	45.09	40.69	70	40	8.34	7.13	
J-74	30	35	37.69	44.78	70	40	7.13	4.5	
J-80	28	40	33.21	34.98	55	35.4	7.35	6.64	
J-81	30	37	34.97	41.3	52.2	43.1	7.54	5.42	4.95
J-90	37	43	37.15	43.8	52	62.7	10.15	6.49	
J-91				20.28			6.03	5.58	
J-97	26	35	29.79	32.48	55.5	36	9.7	5.32	
J-98	12	22	21.08	21.93	71.6	29	6.24	3.77	
J-110	15	19	16.1	16.68	52.4	53.8	5.73	4	
J-114							6.84	5.76	

Table A.1 (Cont'd).									
Oneota-Style									
Vessel #	**rim diameter (cm)**	**shoulder diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**shoulder angle (deg)**	**rim thickness (mm)**	**shoulder thickness (mm)**	**base thickness (mm)**
J-120	16		22.13	23.09	68	28.4	7.32	4.58	
J-139	18	21	20.53	21.65	49	53.9	5.83	5.97	
J-166	10		13.23	14.3	44.3	43.1	4.49	3.54	
J-167							6.7	5.65	
J-172	22		33.5	36.35	60	30.5	9.69	4.43	
J-182	34			48.86	70		8.16	6.57	
J-187	16		22.3	23.64	54.8	43	6.86	5.67	
J-232	31		37.67	41.53	55.3	37.8	7.1	4.72	
J-240	26		30.36	37.02	44.1	43.2	11.41	8.84	
J-242	16	21	23.93	27.15	54.5	39.2	5.58	5.18	
J-246	18		30.75	31.8	62.8	28.4	8.7	7.52	
J-265	13	19	22.33	22.71	69.1	34.1	6.4	3.92	
J-267								6.3	
J-269	6	10	12.62	13.16	58.8	51	4.94	4.28	2.61
J-301	12		20.09	21.63	51.4	36.8	7.35	3.58	
J-314	18	28	33.22	33.92	64.3	42.8	6.97	5.09	4.09
J-325	23		38.36	40.73	59.7	40.1	10.43	6.51	
J-331	22	30	33.45	38.04	62.9	30.3	6.59	4.62	
J-332	32	47	45.14	48.43	57.9	33.6	10.11	7.18	
J-342				21.92			6.29	6.07	
J-360	23	28	22.55	24.63	48.9	57.2	7.39	5.21	
J-396	12		16.84	17.81	54.3	30.8	6.09	3.84	
J-406				29.12			8.38	5.25	
J-500	12	15		16.82			5.44	5.01	
J-525	38	48	41.78	47.01	53.1	47.2	11.76	9.85	
J-546	11		13.03	14	63.3	46.1	4.91	4.94	
J-577	14		15.21	16.72	43.7	56.7	5.03	4.14	
J-608	16		17.98	19.46	64.7	43.5	5.35	4.12	
J-610	21		25.56	31.71	41.5	35.7	8.58	6.26	
J-626	21	28	29.74	31.52	54	45.1	6.9	5.65	
J-NVS-4								5.1	
No #									

Table A.1 (Cont'd).

Vessel #	rim diameter (cm)	shoulder diameter (cm)	rim height (mm)	rim length (mm)	rim angle (deg)	shoulder angle (deg)	rim thickness (mm)	shoulder thickness (mm)	base thickness (mm)
Mississippian-Style									
J-76?	28		25.41	28.46	60	50	7.25	6.27	
J-82	21	31	22.75	23.54	74.2	34	6.3	5.5	
J-101	28	36	27.8	31.29	57	48.5	5.85	6.05	
J-102	32		18.85	25.52	37.5	53.6	5.83	5.21	
J-158	15		18.9	19.63	57.4	38.5	7.68	3.47	
J-178				24.83			9.41		
J-210	18		23.75	24.47	63	37.3	7.85	5.65	
J-318	26		22.63	25.69	57.2	53.4	7.02	5.14	
J-526	20	29		21.83			5.53	6.85	
J-527	30		19.08	24.04	37.7	51.5	7.63	7.47	
J-528	20		22.62	23.63	69.4	33.4	8.69	5.5	
J-529	26		25.55	27.15	72.8	44.2	8.24	8.28	
J-530	26		19.05	21.6	49.2	39	12.17	7.71	
J-580	28		24.71	26.31	46.5	47	8.05	5.36	
J-628	18	23	16.39	16.39	79.3	61.3	7.3	5.34	
No #									
No #									
No #									
No #									
Indeterminate Style									
J-4	10	14	20.22	21.71	64.7	23	7.32	10.59	8.14
J-44	6	8	10.4	11.11	68.3	42.8	5.15	5.01	
J-47	29	43	11.73	13.96	31.4	34.5	6.61	6.39	
J-131	26	30	29.71	30.81	65.4	57.3	7.95	6.36	
J-524	10	13	15.3	14.63	69.4	58.6	5.06	4.32	
J-531	24		19.1	20.25	67.9	49.2	6.45	5.7	
J-654	>20			27.69			6.17	6.29	

Table A.2. Morton Village (11F2) Bowl Metric Data						
Oneota-Style						
Vessel #	**rim diameter (cm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**side thickness (mm)**	**base thickness (mm)**
P/B-V9	16	90	6.02	7.3		4.9
P/B-V14	30		7.24	8.64		
P/B-V21	26	70	5.22	8.25		
P/B-V25	32		5.15	8.23	6.71	
P/B-V26	50		6.15	6.96		3.34
P/B-V38	14	75	4.48	4.63		3.52
P/B-V56	36	65	6.3	6.98	9.27	
P/B-V71	29	75	7.86	8.55	4.86	
P/B-V155	38	75	5.85	7.16	5.4	
P/B-V204		45	8.87	9.43	6.93	
P/B-V215	32	55	7.61	9.28	7.14	
P/B-V224		40	5.68	8.92		6.22
P/B-V232	17	65	4.72	5.87		6.86
P/B-V233	22	80	4.55	5.01	4.25	
P/B-V235	41	85	8.11	8.23	6.71	
P/B-V249	22	60	6.32	7.11		4.75
P/B-V277	32	80	8.18	10.29	6.29	
P/B-V279	21	80	6.76	6.09		4.96
P/B-V280	23	80	6.48	8.51		6.28
P/B-V288	24	85	7.09	6.96	4.28	
P/B-V293	30	65	7.27	9.91		6.11
P/B-V297	24		7.78	9.39	8.76	
P/B-V301	17	80	5.72	8.3	6.31	
P/B-V309	20	80	5.75	6.6		6.14
P/B-V335	30		7.79	8.51		6.31
P/B-V-NVS-60	27	75	5.54	8.12		
P/B-V-NVS-79	30	75	7.84	8.62	6.41	
No #						

Table A.2 (Cont'd).						
Mississippian-Style						
Vessel #	**rim diameter (cm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**side thickness (mm)**	**base thickness (mm)**
P/B-V4	42			14.01	8.6	
P/B-V30	32	80	10.9	8.83		
P/B-V41	32		7.79	6		
P/B-V82			6.31	6.96		
P/B-V94	8	85	5.5	6.01	4.22	
P/B-V96	39	75	9.36	11.72	9.91	8.23
P/B-V114		85	10.17	10.52	10.03	
P/B-V137	38	75	8.92	10.27	5.9	
No #						
Indeterminate Style						
PB-V19	26		6.01	7.1		
PB-V20	30	55	5.92	7.36		5.06
PB-V32	30	90	10.71	7.57	8.99	
PB-V34	32	80	9.61	9.12		
PB-V37	36		11.22	9.93		
PB-V57			9.72	10.93		
PB-V63	22	75	6.91	7.11		
PB-V66	41	60	9.12	10.35		
PB-V93	51	80	12.21	11.37		
PB-V97	29	60	7.56	6.53		4.63
PB-V107		85	5.11	6.74		
PB-V111	45	85	7.36	11.02		
PB-V130	34	75	6.83	7.14		
PB-V132	28	50	7.23	7.73		
PB-V138	23	67	6.08	6.92		5.94
PB-V153	22	67	6.85	8.87		
PB-V155	38	75	5.85	7.16		
PB-V165		70	5.77	6.55		5.45
PB-V169	48	75	7.46	10.39		
PB-V211	17	75	4.25	5.66		
PB-V216	26	65	8.21	10.32		
PB-V226	27	85	5.92	7.3		5.34
PB-V227	22	80	5.97	7.6		4.38
PB-V228	22	85	8.01	9.33		

Table A.2 (Cont'd).

Indeterminate Style (Continued)						
Vessel #	**rim diameter (cm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**side thickness (mm)**	**base thickness (mm)**
PB-V235	41	85	8.11	8.23		
PB-V244	22	75	7.76	8.28		
PB-V252			6.36	7.16		
PB-V257	23	55	7.04	8.63		
PB-V260	25	80	7.93	7.98		
PB-V273	31	85	9.25	8.73		
PB-V276	29	70	6.48	7.57		7.16
PB-V283	18	85	4.92	6.41		
PB-V285	16	80	5.18	6.42		
PB-V287	28	70	7.31	7.59		
PB-V292	33		7.55	8.37		4.51
PB-V303						
PB-V307						
PB-V308						
PB-V332						

Table A.3. Morton Village (11F2) Plate Metric Data							
Oneota-Style							
Vessel #	**rim diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**base thickness (mm)**
P/B-V55	23		62.45	50	4.04	7.6	
P/B-V158	31			25	5.03	10.26	5.29
P/B-V187					4.21	8.69	
P/B-V208	30			40	8.02	9.1	
P/B-V243						7.6	6.27
P/B-V253					6.02	6.74	
P/B-V258	40		48.53		6.76	7.46	4.05
P/B-V262	30	50	71.58	50	4.69	8.25	5.47
P/B-V314	25		70.83	55	4.75	9.86	
P/B-V315	36			55	5.66	6.06	
P/B-NVS-59						11.46	
Mississippian-Style							
P/B-V5				25		6.92	4.82
P/B-V27	30			15	6.58	6.04	
P/B-V31					7.26	7.63	
P/B-V33	30	60	86	75	8.22	8.47	3.74
P/B-V36	36		55		7.45	8.37	
P/B-V68		50	86.86	50	6.22	7.94	
P/B-V90						6.81	5.87
P/B-V101	32	22	95	20	5.83	7.76	4.05
P/B-V127	14	40.16	46.4	70	5.14	6.62	3.6
P/B-V145	20	28	74.51	25	5.15	7	
P/B-V181	26				6.49	8.97	
P/B-V209	18	34	57.75	55	4.56	5.26	
P/B-V255	21	50	75.45	60	7.05	7.09	
P/B-V272			60.91		5.8	7.45	4.38
P/B-V312						5.51	
P/B-V318						8	
P/B-V322					6.07	7.03	5.99
P/B-V328	30			40	6.1	8.3	
P/B-V329				35			

Table A.3 (Cont'd).							
Mississippian-Style (Continued)							
Vessel #	**rim diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**base thickness (mm)**
P/B-V347	32				6.6	9.39	
P/B-V349	23			30	6.39	6.27	
P/B-V352	35	71	84.4	45	7.93	7.01	
P/B-V353					6.85	8.65	
P/B-V368	38	46.53	66.54	45	6.1	11.3	5.7
P/B-V374	42	59.38	96.43	40	5.43	7.36	4.03
?							
?							
?							
?							
Indeterminate Style							
P/B-V140		30.38	60.07	45	6.16	7.35	6.14
P/B-V261					6.77	7.75	
P/B-V342	20	39.34	57.71	45	5.11	7.19	

Table A.4. Larson (11F3) Jar Metric Data									
Vessel #	**rim diameter (cm)**	**shoulder diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**shoulder angle (deg)**	**rim thickness (mm)**	**shoulder thickness (mm)**	**base thickness (mm)**
J-1	12	17	10.99	11.58	63.7	58.6	4.9	4.97	
J-2	25		17.17	19.48	63.1	30.8	8.44	5.85	
J-4			17.87	19.28			6.56	6.05	
J-5	13	16	7.42	9.46			4.31	3.12	
J-6	15		7.74	9.65	24.8	51	5.41	3.77	
J-7	32		20.73	23.77	42.9	36.3	8.52	6.19	
J-8	27		25.68	29.67	59.2	46.4	9.7	7.62	
J-9	17		16.16	16.83	67.3	49.4	6.07	6.47	
J-10	18	24	14.74	14.9	59.4	57.4	5.95	6.91	8.28
J-11	23		16.07	17.5	66.5	33.3	7.98	6.68	
J-12	12		30.55	30.55	85.4	40.5	5.53	3.81	
J-13	17	23	13.18	16.5	61.8	52.7	5.7	5.15	6.85
J-14							8.7	5.92	
J-15	21		15.09	16.02	56.1	49	5.61	3.75	
J-16	22		12.53	16.14	32	49.1	7.55	5.57	
J-17	15		10.91	11.57	59.8	50.9	6.3	6.51	
J-18	30		14.55	19.82	38.6	48.6	6.29	5.77	
J-19	30	35	12.96	16.78	36.7	54.1	8.43	8.77	
J-20							8.08	7.45	
J-21	33	43	17.31	21.24	49.3	46.1	7.8	9.29	
J-22	14	16	15.23	15.33	71.4	50.2	5.3	4.41	4.83
J-23	15	17	5.75	8.46	31.6	64.8	4.15	4.7	
J-24	27		19.64	21.36	48.3	40.3	8.35	8.61	
J-25	35		22.06	24.87	35.1	46.5	8.59	7.71	
J-26	31		17.76	19.25	47.8	40.5	8.01	7.98	
J-27	12		9.62	9.62	57.2	63.1	4.75	5.8	
J-28	13	19	6.26	7.53	65.1	33.2	4.01	5.19	
J-29	28		18.99	22.73			8.2	5.07	
J-30	25		20.69	24.35	42.8	37.3	9.03	9.06	
J-31	33		19.34	19.79	49.9	42.5	11.95	6.23	
J-32	36		20.46	22.95	39.5	57.4	12.95	7.35	
J-33	29		20.34	24.79	39.6	47.2	8.49	8.61	
J-34				22.55			8.49	6.11	
J-35	27		21.16	23.72	58.1	39.8	8.28	6.22	
J-36	29		24.61	26.54	64.8	35.6	7.66	6.32	
J-37								8.15	

Table A.5. Larson (11F3) Bowl Metric Data						
Vessel #	**rim diameter (cm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**side thickness (mm)**	**base thickness (mm)**
B-1			6.15	8.54	9.7	
B-2	30	60.3	11.73	9.55		
B-3	43	65.3	11.82	8.57	5.77	
B-4	16	71	5.18	3.57	4.31	
B-5	36	54.5	9.99	10.84	7.6	
B-6		67.1	12.99	8.77	8.17	
B-7	37	61.8	11.63	9.94		
B-8	25	79	7.02	5.53		3.45
B-9			8.9	7.16		
B-10	30	56.4	5.8	7.39		7.49
B-11	22	88	6.93	7.01	7.32	
B-12	20	50.3	8.19	7.73	7.49	
B-13	38	67.5	10.42	8.38	6.59	
B-14		66.5	10.56	7.43	9.45	
B-15	17	65.3	5.99	7.24		6.28
B-16	11	117.9	6.84	6.63		
B-17	16	55.7	8.83	9.52		
B-18	13	58.1	4.95	4.53		6.73

Table A.6. Larson (11F3) Plate Metric Data							
Vessel #	**rim diameter (cm)**	**rim height (mm)**	**rim length (mm)**	**rim angle (deg)**	**lip thickness (mm)**	**rim thickness (mm)**	**base thickness (mm)**
P-1						7.31	
P-2	26	18.34	41.05	32.6	5.97	11.39	
P-3	34	23.11	40.29	30.6	7.19	8.44	8.02
P-4	25		36.16		5.05	6.38	
P-5	30	21.83	33.48	29.6	5.9	6.27	
P-6	28	15.51	59.32	22.5	5.33	5.74	
P-7	38	22.98	57.22	28.1	8.25	6.59	4.92
P-8	25	9.72	26.23	25.8	6.48	7.65	6.35
P-9	25	22.25	33.25	43.7	4.88	6.79	
P-10						9.13	
P-11					5.73	6.91	
P-12	21	11.24	27.9	32.8	3.22	6.34	
P-13	24	7.96	28.97	22.1	5.81	7.27	
P-14						6.04	14.89
P-15						10.04	
P-16	28	10.56	38.08	27.8	6.45	7.34	
P-17	26	13.77	45.33	21.7	7.16	9.22	
P-18			65.47		5.38	7.72	
P-19	35	27.81	52.24	32.6	8.05	7.88	9.62
P-20	30	32.49	59.49	34.6	6.45	7.38	5.78
P-21	31	39.22	59.94	41.2	7.06	8.2	
P-22	33	30.3	47.31	38.3	4.62	5.88	
P-23	20	14.54	28.59	32.8	5.2	5.53	
P-24			37.64	41.6	5.44	5.77	
P-25	28	16.31	29.05	38.3	7.23	7.45	
P-26						6.84	
P-27		15.35	25.42	30.5	5.3	6.79	

Table A.7. Tremaine Complex Jar Metric Data

Tremaine Site (47LC95)- Data previously published in O'Gorman 1995									
Vessel #	rim diameter (cm)	shoulder diameter (cm)	rim height (mm)	rim length (mm)	rim angle (deg)	shoulder angle (deg)	rim thickness (mm)	shoulder thickness (mm)	base thickness (mm)
F1V1	30		23	40	70	60	8	6	
F5V1	32		29	38	60	40	11	5	
F51V1	32		26	33	55	35	10	9	
F59V1	36		35.2	45	50	30	7	4.7	
F59V2			24	30	70	45	8	6.4	
F108V1			28	38	75	30	10	7	
F145V3	22		22.2	36	40	40	7.5	6	
F145V4	26		20	40	45	40	8.3	7.4	
F155V1	30	44	32.4	44	50	30	8	8	
F223V1	26		26	28	80	40	7	7	
F237V1	28		32.6	38	55	40	9.6	6.5	
F238V1									
F259V1	17		23.6	36	50	10	5	5	
F259V3			38	45	65	40	8	7	
F317V2	24		29.7	33.4	70	30	8.4	6	
F319V2	26		40	46	80	40	10	7.5	
F334V1	32		39.5	47	75	30	7.4	5	
F336V2	22		27	33	60	30	8	6.8	
F338V1	32		24.8	32	70	40	7.5	6.1	
F346V1	14		18	24	75	25	6.6	5.6	
F348V1?									
F348V2	14	18	23	27	75	40	5.7	5	
F348V3	26	39	29	37	80	30	7.5	6	
F348V5	34	49	37	39	75	20	8	5	
F367V1	32		44	45	65	40	8.9	7.4	
F367 NVS-1									
F368V1	30		21.4	30	40	55	9.5	5	
F368V2			41	48	70	30	8.5	6	
F400V4	32		38.8	40	80	40	6	4	
F400V5	32		37	40	70	45	8.8	6	
F402V1	23		28	35	70	40	5	4	
F415V1	32		27.7	36	50	60	8	4	
F448V1	34		22.4	45	40	45	7	6	
F461V2	30		24.5	28.5	65	30	6.5	4	

Table A.7 (Cont'd).

Vessel #	rim diameter (cm)	shoulder diameter (cm)	rim height (mm)	rim length (mm)	rim angle (deg)	shoulder angle (deg)	rim thickness (mm)	shoulder thickness (mm)	base thickness (mm)
Tremaine Site (47LC95)- Data previously published in O'Gorman 1995									
F537V1			28	37	65	50	10	6	
F599V1	36	44	39	49	65	30	7.5	6	
F599V2	26		24	35	45	50	9	5.4	
F613V1	34	44	41	45.7	50	30	9	6	
F648V4	32		28.4	41.5	70	30		8.7	
F692V1	32		31	43.6	60	35	5.5	5	
F698V1	20		33.7	38	55	20	3.7	3.4	
F735V1	30		22.2	32	50	40	7.6	8	
F963V1			36.5		75	35	7	4.7	
OT Site (47LC262)- Data previously published in O'Gorman 1993									
F3V?									
F3V1	17	24	21.3		75	30	6.5		
F3V7	32, 24		34.9		65	45	9		
F43V1	31	46	47		80	25	8		
F46V2	36		62		80	20	9.7		
F55V3	34	43	58.6		75	30	10.6		
F91V2	28	36	23		80	50	7.2		
F113V1			34.8		80	20	10		

APPENDIX B

Coding Schemes for Use-Wear and Spatial Data

Table B.1. Use-Wear Coding Scheme used for Jars

Part of Vessel	Code	Summary
Exterior	1	No sooting
	2a	Sooting on top half- bands on rim and shoulder
	2b	Sooting on top half- patchy throughout
	2c	Sooting on top half- continuous
	2d	Sooting on top half- amorphous
	3a	Sooting on top half, unknown bottom edge- bands on rim and shoulder
	3b	Sooting on top half, unknown bottom edge- patchy throughout
	3c	Sooting on top half, unknown bottom edge- continuous
	3d	Sooting on top half, unknown bottom edge- amorphous
	4a	Sooting on bottom half- patchy
	4b	Sooting on bottom half- continuous
	4c	Sooting on bottom half- amorphous
	5a	Sooting all over- patchy
	5b	Sooting all over- continuous
	6	Amorphous sooting
Interior	1	No carbonization
	2a	Carbonization on rim only- patchy
	2b	Carbonization on rim only- clear band
	3a	Carbonization on bottom only- patchy
	3b	Carbonization on bottom only- continuous
	4a	Carbonization on rim and base, break between- patchy
	4b	Carbonization on rim and base, break between- zones continuous
	5	Heavy carbonization on rim/neck, zone of light carbonization below
	6	Lighter zone of carbonization on rim/neck, heavy carbonization below
	7a	Patchy carbonization throughout body
	7b	Interior continuously covered with carbonization
	8	Possible decoction- thick band of carbonization in mid-body
	9	Amorphous carbonization

Table B.2. Description of Jar Functional Categories		
Functional Category	**Code**	**Associated Carbonization Patterns**
Storage/Serving	1	No soot on exterior or carbonization on interior
Wet Mode	2	Soot on exterior; carbonization on interior rim and upper shoulder only
Dry Mode	3	Soot on exterior; carbonization on interior lower body and base only
Multi-Purpose	4	Soot on exterior; areas of carbonization near rim and on lower body with clean zone in between
Stewing/Multi-Purpose	5	Soot on exterior; carbonization all throughout interior
Possible Decoction	6	Soot on exterior; wide zone of carbonization found in middle of vessel interior but with a base that is clean
Possible Griddle	7	Only half of vessel profile present; exterior may have soot or may be oxidized; circular patch of carbonization present mid-body
Unknown	8	Soot on exterior but no interior carbonization; anomalous interior carbonization pattern that does not fit above categories

Table B.3. Use-Wear Coding Scheme used for Bowls and Plates		
Part of Vessel	**Code**	**Summary**
Exterior	1	No sooting
	2a	Sooting on top half- patchy
	2b	Sooting on top half- continuous
	3a	Sooting on top half, unknown end- patchy
	3b	Sooting on top half, unknown end- continuous
	4a	Sooting on bottom half- patchy
	4b	Sooting on bottom half- continuous
	5a	Sooting all over- patchy
	5b	Sooting all over- continuous
	6	Amorphous sooting
Interior	1	No carbonization
	2a	Carbonization on rim only- patchy
	2b	Carbonization on rim only- continuous
	3a	Carbonization on bottom only- patchy
	3b	Carbonization on bottom only- continuous
	4a	Carbonization on rim and base- patchy
	4b	Carbonization on rim and base- continuous
	5	Amorphous carbonization

Table B.4. Description of Bowl and Plate Functional Categories		
Functional Category	**Code**	**Associated Carbonization Patterns**
Storage/Serving	1	No soot on exterior or carbonization on interior
Wet Mode	2	Soot on exterior; carbonization on interior rim and upper body only
Dry Mode	3	Soot on exterior; carbonization on interior lower body and base only
Multi-Purpose	4	Soot on exterior; areas of carbonization near rim and on lower body with clean zone in between
Unknown	5	Soot on exterior but no interior carbonization; anomalous interior carbonization pattern that does not fit above categories

Table B.5. Coding Scheme for Spatial Analysis		
Spatial Category	**Code**	**Ethnographic Cooking Location**
Inside a structure	1	Cooking at an indoor hearth
Within 4 m of a structure	2	Cooking at an outdoor hearth near home, possibly under a sunshade or temporary structure
More than 4 m from a structure	3	cooking outside in an open, communal space

APPENDIX C

Use-Wear and Spatial Data

Table C.1. Morton Village (11F2) Jar Spatial and Use-Alteration Data								
Oneota-Style								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
J-1	F. 109		L. 2074	1	rim-shoulder	2b	1	1
J-2	F. 109		L. 2061	1	rim-shoulder	1	4a	4
J-3	F. 109		L. 2078	1	rim-shoulder	3c	2b	2
J-5	F. 109		L. 2077	1	rim-shoulder	2b	2b	2
J-6	F. 109		L. 2044	1	rim-shoulder	1	2b	2
J-7	F. 77		L. 1573	2	rim-shoulder	3c	2a	2
J-8	F. 77		L. 1573	2	rim-shoulder	3b	7b	5
J-10	F. 69		L. 1625	2	rim-shoulder	3c	7b	5
J-15	F. 42		L. 863.1	3	rim-shoulder	3b	9	8
J-19	F. 42		L. 867.2, 869.1	3	shoulder/body	1	3a	3
J-21	F. 42		L. 868.1	3	rim-shoulder	1	1	1
J-22	F. 42		L. 859	2	rim-body	2b	2b	2
J-23	H. 14		L. 2029	1	mid rim-shoulder	3b	7a	4
J-24	H. 14		L. 2030	1	mid rim-shoulder	3b	1	1
J-25	H. 14		L. 2030	1	rim-shoulder	3b	1	1
J-26	H. 14		L. 2030	1	rim-shoulder	3b	2b	2
J-27	H. 14 fill		L. 2030	2	rim-shoulder	3b	5	5
J-29	H. 13 Z.1		L. 1940	1	rim-shoulder	1	1	1
J- 30	H. 13 fill		L. 1926	3	rim-shoulder	1	1	1
J-31	H. 13 Z.1		L. 1935	1	rim-shoulder	2b	4b	4
J-34	H. 13		L. 2092	1	rim-shoulder	2a	4b	4
J-36	H. 13 Z.A		L. 2009	1	rim-side	1	1	1
J-41	F. 36		L. 956.5	2	rim- shoulder	3c	5	5
J-46	F. 59		L. 1467	2	rim-side	3c	4b	4
J-52	H. 14		L. 2030	1	shoulder/body	3a	7b	5
J-59	F. 287/5p	1		3	rim-shoulder	3b	2b	2
J-68	F. 288/2np	1		3	rim-side	3c	6	5
J-74	F. 295/1 Z.2	7		3	rim-shoulder	3c	3b	3
J-80	F. 93		L. 1966, Item A	3	rim-shoulder	2a	5	5
J-81	F. 93		L. 1966, Item E	3	nearly complete	2a	2b	2
J-90	F. 36		L. 950.26	2	rim-shoulder	3c	8	6

Table C.1 (Cont'd).

Oneota-Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
J-91	F. 67		L. 1609	2	rim-side	3c	4b	4
J-97	F. 50 Z.1		L. 1410	?	rim-side	4a	1	8
J-98	F. 60		L. 1462	2	rim-side	3a	4b	4
J-110	Str. 16, SQ 10/4	1, 2		1	rim-shoulder	3c	2b	2
J-114	F. 154/1np	13		3	rim-shoulder	1	1	1
J-120	F. 154/4, art#1	57		3	rim-shoulder	1	1	1
J-139	F. 151/1, SQ 13/4	151/1np-1, 151/1-1, 13/4-1		1	rim-shoulder	3b	7b	5
J-166	F. 160/1	1, 8		3	rim-shoulder	3b	2a	8
J-167	F. 158/2, art 2	10		1	rim-shoulder	1	1	1
J-172	F. 180/1, art# B	1		1	rim, body segments	4a	7b	5
J-182	SQ 42/5	7, PP# 164		1	rim-shoulder	1	1	1
J-187	F. 186/1	4, 39		1	rim-shoulder	1	7b	5
J-232	F. 243/1	80, 81, 75, 73, 71, 62		3	rim-shoulder	3c	2b	2
J-240	F. 230/2p, 3p	2p-1, 2p-2, 2p-6, 3p-9		3	rim-shoulder	2c	7a	5
J-242	F. 232/6p, 10p	6p-2, 10p-2		2	rim-shoulder	2b	7a	5
J-246	F. 232/4p	1		2	rim-shoulder	3c	4b	4
J-265	Blk 7/2, Area B	3, 4		2	rim-shoulder	2a	5	5
J-267	Str. 25, Blk 3/1, NW quad Area A	9, 17, 37, 38 (PP#2)		1	rim-body	1	1	1
J-269	F. 232/7p	1		2	rim-body	3b	3b	3
J-301	F. 260/3p	4		2	rim-shoulder	4a	1	8
J-314	Str. 33, SQ 94/2, Area A	1, PP#4		1	rim-base	5b	7b	5
J-325	F. 232/6	1		2	rim-shoulder	3b	1	8

Table C.1 (Cont'd).								
Oneota-Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
J-331	F. 182/2np; Str. 16	182/2np-1, Str. 16-1, PP91		1	rim-side	3a	2b	2
J-332	Str. 16/1, Area A	15, 16		1	rim-side	1	1	1
J-342	F. 182/4	2		1	rim-shoulder	3a	7b	5
J-360	F. 68 E1/2		L. 1611	2	rim-side	3c	7b	5
J-396	H. 13 backdirt		L. 1986	?	rim-shoulder	3c	4b	4
J-406	F. 83 SW1/2 Z.1 and 2 mixed		L. 1847	2	rim-shoulder	2a	7b	5
J-500	F. 106		L. 2010	1	rim-shoulder	4a	1	8
J-525	F. 224/1, P1	1		1	rim-shoulder	1	9	8
J-546	F. 318/1p	8, 9		2	rim-side	1	1	1
J-577	Str. 26 NE/1, SE/1	NE/1-16; SE/1-36		1	rim-side	3b	7b	5
J-608	SQ 149/Str. 51/1	13		1	rim-shoulder	5a	7b	5
J-610	SQ 153/Str. 21/3 Area A	1		1	rim-side	3b	7a	5
J-626	SQ 145/Str. 47/1	12		1	rim-side	1	9	7
J-NVS-4	F. 36		L. 1933, 818	2	shoulder/body	3c	7b	5
No #	F. 159/4	1		3	rim-shoulder	3b	9	8
Mississippian-Style								
J-76?	Str. 34, Blk 18/1 Area A	8,PP#2		1	rim-shoulder	6	7b	5
J-82	F. 93, Item B		L. 1966	3	rim-near base	5a	7b	5
J-101	F. 155/10	1		3	rim-body	3c	2b	2
J-102	F. 155/6	5, Art#1		3	rim-shoulder	1	1	1

Table C.1 (Cont'd).

Vessel #	Prov.	TC #	Lot #	Spatial Zone	Part of Vessel	Ext. Sooting	Int. Carbonization	Functional Category
Mississippian-Style (Continued)								
J-158	F. 152/3np	27		3	rim-shoulder	3c	9	8
J-178	SQ 62/5	8, 12		1	rim-shoulder	3b	5	5
J-210	SQ 65/3	3-3, 3areaB -5		2	rim-shoulder	3c	2b	2
J-318	F. 152/3np	4		3	rim-shoulder	1	1	1
J-526	F. 224/4np	3		1	rim-body	2a	3a	3
J-527	F. 224/4np	1		1	rim-shoulder	3a	7b	5
J-528	F. 224/3 P.2	2		1	rim-shoulder	3c	7b	5
J-529	F. 224/3np	9		1	rim-shoulder	1	1	1
J-530	F. 224/3 P.2	3		1	rim-shoulder	1	2b	2
J-628	Str. 34, SQ 130/1	5, Art#7		1	rim-shoulder	3c	7b	5
No #	F. 224/5p	9		1	rim-shoulder	3b	5	5
No #	F. 3 Z.3			?	rim-shoulder	3b	3b	3
No #	F. 3 Z.2		L. 13	?	rim-shoulder	3b	7a	5
No #	F. 3/13, 18			?	rim-body	5a	6	5
Indeterminate Style								
J-4	F. 109		L. 2045	1	complete profile	6	9	1?
J-44	F. 36		L. 933.3	2	nearly complete profile	1	1	1
J-47	H. 8		L. 1690, Item 29	1	rim-side	1	2b	8
J-131	F. 152/3np	23, 24, 25		3	rim-shoulder	2b	4b	4
J-524	F. 224/2np	1		1	rim-side	1	1	1
J-531	F. 3 Z.3		L. 19	?	rim-shoulder	1	2a	8
J-654	F. 304/4p, 5p	4p-2, 5p-1		1	rim-side	1	1	1

Table C.2. Morton Village (11F2) Bowl Spatial and Use-Alteration Data								
Oneota-Style								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
P/B-V9	Str. 32, SQ 15/4	8, 9, 13		1	rim-near base	1	1	1
P/B-V14	SQ 12/4 Area A	1		3	rim-side	3b	2b	2
P/B-V21	F. 154/3	2		3	rim-side	1	1	1
P/B-V25	F. 154/1	9, 18		3	rim-side	1	1	1
P/B-V26	F. 154/4	19		3	rim-side	1	1	1
P/B-V38	F. 165, SE quad	2		1	rim-base	1	1	1
P/B-V56	F. 173/2	2		3	rim-side	1	1	1
P/B-V71	Str. 22, SQ 69/4, 5	4-12, 5-30		1	rim-side	1	1	1
P/B-V155	F. 284/1	8, 26		3	rim-side	3a	1	5
P/B-V204	Backdirt		L. 1436	?	rim-side	1	1	1
P/B-V215	F. 21		L. 502	3	rim-side	1	1	1
P/B-V224	F. 76, Item 8			3	rim-side	1	1	5
P/B-V232	F. 42		L. 861.1	3	rim-base	5a	3b	3
P/B-V233	F. 42		L. 861.4	3	rim-side	1	1	1
P/B-V235	F. 42		L. 854.1	3	rim-side	3a	3b	3
P/B-V249	F. 69 W1/2		L. 1495	2	rim-side	6	5	5
P/B-V277	H. 9 midden		L. 1174.21	?	rim-side	3a	2a	5
P/B-V279	H. 8 and 9		L. 1756	1	rim-near base	1	1	1
P/B-V280	H. 8			1	rim-side	1	1	1
P/B-V288	F. 109		L. 2064	1	rim-side	1	3b	3
P/B-V293			L. 2011	?	rim-near base	2b	2b	2
P/B-V297	F. 280/1 Z.2	6		3	rim-side	2a	1	5
P/B-V301	H. 13 fill		L. 1930	3	rim-side	3b	1	5
P/B-V309	H. 13		L. 1930, 1927, 1890, 1933	1	rim-near base	1	1	1
P/B-V335	F. 36		L. 874, 950	2	rim-base	1	1	1

Table C.2 (Cont'd).								
Oneota-Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
P/B-V-NVS-60	F. 36		L. 818.1	2	rim-near base	1	1	1
P/B-V-NVS-79	H. 14		L. 2033	1	rim-near base	1	1	1
No #	F. 173/1np	2		3	rim	3b	4b	4
Mississippian-Style								
P/B-V4	SQ 11/3 and 4	3-2 and 3, 4-1		2	rim-side	1	1	1
P/B-V30	F. 155/12	5		3	rim-side	3b	1	5
P/B-V41	F. 211/1p	3		2	rim-side	2b	2b	2
P/B-V82	F. 241/4p	6		3	rim-side	1	1	1
P/B-V94	Str. 28/1 Area B	25		1	rim-side	1	1	1
P/B-V96	F. 224/3 P.2, 3np	3np-3, 3p2-1		1	rim-side, base	2b	3a	3
P/B-V114	Blk 9/3 Area A	33, 34		2	rim-side	3b	1	5
P/B-V137	F. 171/8	1, PP20		2	rim-side	3b	1	5
No #	F. 304/4p	1		1	rim-side	2b	3b	3
Indeterminate Style								
PB-V19	F. 154/1np, 2np, 4, 5	1np-3, 2np-23, 2np-41, 4-23, 5-4, 4-12		3	rim-side	1	1	1
PB-V20	F. 154/4, 5	4-28, 5-9, 5-11		3	rim-side	1	1	1
PB-V32	F. 155/8B	2		3	rim-side	3b	1	5
PB-V34	F. 155/12, profile	12-6, 12-2, profile-2		3	rim-near base	6	1	1
PB-V37	SQ 23/4	9		3	rim-side	2b	1	5
PB-V57	F. 186/4	2		?	rim-side	3b	1	5
PB-V63	F. 203/2B	3		1	rim-side	1	4b	5
PB-V66	SQ 63/7	1, 2 (Art#1)		2	rim-side	1	1	1

Table C.2 (Cont'd).								
Indeterminate Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
PB-V93	Str. 28/2C	1		1	rim-side	2b	1	5
PB-V97	F. 224/2, 3np	2/p2-10, 3np-7		1	rim-base	1	1	1
PB-V107	F. 245/2p, 4p	2p-1, 4p-5, 4p-10		3	rim-side	1	1	1
PB-V111	Blk 3/3A	1		1	rim-side	1	1	1
PB-V130	F. 232/4p	8		2	rim-side	1	1	1
PB-V132	F. 232/3p	6		2	rim-side	3b	1	5
PB-V138	F. 269/3, F. 272/1	269/3-1; 272/1-1		1	rim-base	5b	4b	3
PB-V153	F. 260/1np, 4p	1np-1, 1np-4, 4p-3		2	rim-side	1	1	1
PB-V155	F. 284/1np	26		3	rim-side	1	1	1
PB-V165	F. 281/1	3		3	rim-side	4a	5	5
PB-V169	F. 288/1, 3p	1-10; 3p-1		3	rim-side	1	5	5
PB-V211	Backdirt near house 6		L. 1007.1	?	rim-side	1	1	1
PB-V216	F. 106		L. 2010	1	rim-side	1	2b	5
PB-V226	F. 36		L. 950	2	rim-base	1	1	1
PB-V227	F. 36		L. 818.3, 950.10	2	rim-base	5b	3b	2
PB-V228	F. 36		L. 950.9, 874.2	2	rim-side	5b	1	5
PB-V235	H. 13 overburden, Area 6		L. 1891	3	rim-side	2b	3b	3
PB-V244	F. 62		L. 1596	2	rim-side	3a	2a	5
PB-V252	F. 70		L. 1622, 1650	3	rim-side	1	1	1
PB-V257	F. 81, H. 13		L. 1661	1	rim-side	1	1	1
PB-V260	F. 81 top 5-15 cm, Area 6		L. 1661	1	rim-side	3a	1	5
PB-V273	F. 91 E1/2, Area 6		L. 1923	2	rim-side	3b	1	5

Table C.2 (Cont'd).								
Indeterminate Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
PB-V276	H. 8, Item 40		L. 1701	1	rim-base	1	1	1
PB-V283	F. 109		L. 1861	1	rim-side	1	1	1
PB-V285	F. 109 W1/2		L. 2063	1	rim-side	3b	3b	3
PB-V287	F. 109		L. 2079	1	rim-side	2a	2b	2
PB-V292	H. 8 and 9		L. 1721	1	rim-side	1	1	1
PB-V303	H. 13 Z.1, Area 6		L. 1935	1	rim-side	3b	2b	2
PB-V307	H. 13 fill, Area 6		L. 1938, 1927, 1977	3	rim-side	1	1	1
PB-V308	H.13 basin fill, Area 6		L. 1902, 1930	3	rim-side	1	1	1
PB-V332	F. 36		L. 902, 933	2	rim-base	1	1	1

Table C.3. Morton Village (11F2) Plate Spatial and Use-Alteration Data								
Oneota-Style								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
P/B-V55	F. 173/1np	1		3	rim-well edge	3b	2b	2
P/B-V158	F. 282/1p, F. 282/2p Area A, Blk 12/pz	1p-1, 2pA-1, pz-3		3	rim-well edge	3b	2b	2
P/B-V187	Str. 33, SQ 116/3 Area A	4, PP#39		1	rim	2a	2a	5
P/B-V208	Backdirt		L. 1436	?	rim	1	1	1
P/B-V243	F. 62, Z.1		L. 1553	2	mid rim-well edge	1	1	1
P/B-V253	F. 70, Z.2		L. 1646	3	rim-well edge	1	1	1
P/B-V258	F. 81, H. 13		L. 1661	1	rim	1	1	1
P/B-V262	F. 83 Z.2		L .1848, 1856, 1858	2	rim-well edge	3b	2b	2
P/B-V314	H. 13 fill		L. 1927	3	rim-well edge	3a	2a	2
P/B-V315	H. 13 Z.1		L. 1977	1	rim	1	1	1
P/B-NVS-59	F. 84 S1/2		L. 1870	1	rim-well edge	5b	5	5
Mississippian-Style								
P/B-V5	SQ 4/3	2		3	mid rim-well edge	1	1	1
P/B-V27	F. 154/1, 2np	2, 23		3	rim	1	1	1
P/B-V31	F. 155/7	4		3	rim	1	1	1
P/B-V33	F. 155/12	8		3	rim-base	1	4a	5
P/B-V36	SQ 23/4	5, 12, 13		3	rim	1	1	1
P/B-V68	SQ 65/3 Area B	2, 7		2	rim-well edge	3b	2a	2
P/B-V90	Str. 25/3 Area A	3		1	mid rim-well edge	1	1	1
P/B-V101	F. 224/4	2		1	rim-well edge	1	1	1
P/B-V127	F. 236/1	16		2	rim-well edge	1	1	1
P/B-V145	Str. 33, SQ 97/2	1		1	rim-well edge	1	1	1
P/B-V181	Str. 34, Blk 15/1 Trench 2	1, PP#3		1	rim	1	1	1

Table C.3 (Cont'd).								
Mississippian-Style (Continued)								
Vessel #	**Prov.**	**TC #**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
P/B-V209	Area 6W backdirt		L. 1399	?	rim-well edge	2b	4b	5
P/B-V255	F. 80		L. 1653	2	rim-well edge	1	1	1
P/B-V272	F. 91		L. 1921	2	rim	1	1	1
P/B-V312	H. 13 fill			3	mid rim-well edge	1	1	1
P/B-V318	H. 13 fill		L. 2001	3	mid rim-well edge	1	1	1
P/B-V322	H. 13			1	rim-well edge	1	1	1
P/B-V328	F. 224/3np	19		1	rim-base	5a	4a	4
P/B-V331	F. 15		L. 320.1	2	rim-well edge	1	1	1
P/B-V329	F. 3 Z.3		L. 10	?	rim-well edge	1	2a	5
P/B-V330	F. 3 Z.2		L. 6	?	rim-well edge	1	1	1
P/B-V347	Str. 26 NE/1	13		1	rim	1	1	1
P/B-V349	Str. 26 SE/1	67		1	mid rim-well edge	1	1	1
P/B-V352	Str. 26 NW/1; NE/1	NW/1-6, NE/1-34		1	rim-well edge	1	1	1
P/B-V353	Str. 26 NE/1	39		1	rim	1	1	1
P/B-V368	SQ 128/5	1, Art#1		1	rim-well edge	1	1	1
P/B-V374	SQ 126; F. 320	Various		2	rim-well	1	2b	5
No #	F. 3 Z.1		L. 24	?	rim	1	1	1
No #	F. 323/3p	4		2	rim-well edge	1	1	1
No #	SQ 137/0 Area A	1		1	rim-well edge	1	1	1
No #	F. 324/3p	4		1	rim-well edge	1	1	1
Indeterminate Style								
P/B-V140	F. 203/4np	3		1	rim-well	1	1	1
P/B-V261	F. 82 W1/2		L. 1743	1	rim-well edge	1	1	1
P/B-V342	Str. 26 SE/1	1, PP#127		1	rim-well edge	1	1	1

Table C.4. Larson (11F3) Jar Spatial and Use-Alteration Data

Vessel #	Prov.	Lot #	Spatial Zone	Part of Vessel	Ext. Sooting	Int. Carbonization	Functional Category
J-1	F. 101-A	L. 1212	3	rim-side	3b	9	8
J-2	F. 101	L. 1004	3	rim-shoulder	3c	7b	5
J-4	F. 170	L. 1116	2	rim-side	1	1	1
J-5	F. 140	L. 661	1	rim-side	2a	3b	3
J-6	F. 140	L. 661	1	rim-side	3c	3b	3
J-7	F. 187	L. 1272	1	rim-shoulder	5a	7b	5
J-8			?	rim-shoulder	3b	6	4
J-9	F. 170	L. 1020	2	rim-side	1	2b	2
J-10	H. 54	L.43	1	rim-near base	1	6	7
J-11			?	rim-shoulder	2b	1	1?
J-12	H. 7		1	rim-shoulder	3c	4b	5
J-13	H. 57	L. 554	1	rim-near base	1	4a	5
J-14	H. 65	L. 1163	1	rim-shoulder	2b	2b	2
J-15	F. 190	L. 1529	1	rim-shoulder	1	1	1
J-16	F. 193	L. 1539	?	rim-shoulder	2a	9	8
J-17	F. 199	L. 1448	3	rim-shoulder	3a	2a	8
J-18	F. 193	L. 1402	?	rim-shoulder	2c	2b	2
J-19	F. 190	L. 1374	1	rim-side	5a	1	8
J-20	F. 212	L. 1743	3	rim-side	3c	2b	2
J-21	F. 207	L. 1674	2	rim-side	2c	1	8
J-22	F. 207	L. 1565	2	rim-base	2c	5	5
J-23	F. 210	L. 1592	2	rim-shoulder	2a	1	8
J-24	F. 1	L. 2072	3	rim-shoulder	2b	1	8
J-25	F. 237	L. 1803	2	rim-shoulder	1	1	1
J-26	F. 2	L. 2073	3	rim-side	1	1	1
J-27	F. 219	L. 1913	3	rim-near base	1	1	1
J-28	F. 213	L. 1614	3	rim-side	3c	3b	3
J-29	F. 230	L. 1704	2	rim-shoulder	3b	3b	3
J-30	F. P. 2	L. 2059	?	rim-shoulder	1	7b	5
J-31	F. 237	L. 1758, 1863	2	rim-shoulder	1?	1?	8
J-32	F. P. 2	L. 2059	?	rim-side	2b	3b	3
J-33	F. P. 2	L. 2059	?	rim-shoulder	3c	7b	5
J-34	F. 236	L. 1753	2	rim-shoulder	1	3a	3
J-35	F. 270	L. 2024	?	rim-shoulder	3c	3b	3
J-36	F. 2	L. 2073	3	rim-shoulder	2b	2b	2
J-37	F. 231	L. 1735	3	neck-shoulder	2b	2b	2

Table C.5. Larson (11F3) Bowl Spatial and Use-Alteration Data							
Vessel #	**Prov.**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
B-1	F. 105	L. 1311	2	rim-side	2b	2a	2
B-2	F. 101	L. 1004, 1097	3	rim-side	3b	1	5
B-3	F. 98	L. 995	2	rim-side	2b	1	5
B-4	F. 121	L. 619	3	rim-near base	5b	1	5
B-5	F. 140	L. 641	1	rim-side	2b	4a	5
B-6	F. 165	L. 1305	3	rim-side	2a	1	5
B-7			?	rim-side	1	1	1
B-8	F. 18	L. 12?	2	rim-near base	1	1	1
B-9	H. 57 E. Trench	L. 907	1	rim-side	3a	1	5
B-10	F. 212	L. 1718	3	rim-near base	1	1	1
B-11	F. 1	L. 2072	3	rim-near base	4a	1	5
B-12	F. 269	L. 2008	2	rim-side	1	1	1
B-13	F. 219	L. 1913	3	rim-side	5b	1	5
B-14	F. 239	L. 1770	3	rim-side	2b	1	5
B-15	F. 255	L. 1991	2	rim-near base	1	1	1
B-16	P. Z.	L. 469	?	rim-side	1	1	1
B-17	F. 231, 235	L. 1735	3	rim-side	1	1	1
B-18	F. P. 2	L. 2059	?	rim-base	1	1	1

Table C.6. Larson (11F3) Plate Spatial and Use-Alteration Data							
Vessel #	**Prov.**	**Lot #**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
P-1	F. 103	L. 1471	?	rim-well	1	1	1
P-2	F. 147	L. 666	1	rim-well	1	1	1
P-3	F. 149	L. 704	1	rim-base	2b	3b	3
P-4	F. 140	L. 780	1	rim-well	1	1	1
P-5	F. 101	L. 1097	3	rim-well	1	1	1
P-6	F. 17, 18	L. 11	2	rim-well	1	1	1
P-7	H. 55?		1	rim-base	1	1	1
P-8	H. 59 complex, F. 71	L. 609, 1047, 1052	1	rim-base	2a	3a	3
P-9	H. 75 NW corner	L. 1065	1	rim-well	1	1	1
P-10	H. 65	L. 953	1	mid rim-well	1	1	1
P-11	F. 193	L. 1437, 1539	?	rim-well edge	1	1	1
P-12	F. 193	L. 1437	?	rim-well	1	5	1?
P-13	F. 193	L. 1437	?	rim-well edge	1	1	1
P-14	F. 193	L. 1437	?	rim-base (no lip)	4a	3b	3
P-15	F. 212	L. 1743	3	mid rim-well	1	1	1
P-16	F. 212	L. 1691	3	rim-well edge	2a	3a	3
P-17	F. 212	L. 1718	3	rim-well edge	1	1	1
P-18	F. 212	L. 1718	3	rim-well edge	1	1	1
P-19	F. 109-111, 206, 207	L. 1588	2	rim-base	1	1	1
P-20	F. 230	L. 1701	2	rim-base	1	1	1
P-21	F. 213	L. 1614	3	rim-well edge	1	1	1
P-22			?	rim-well edge	1	1	1
P-23	F. 232	L. 1685	2	rim-well	1	1	1
P-24	F. 255	L. 1991	2	rim-well	1	1	1
P-25	Gen. area of F. 239, 240	L. 1766	3	rim-well	1	1	1
P-26	F. 231	L. 1735	3	mid rim-well	1	1	1
P-27	F. 255	L. 1882	2	rim-well	5a	4a	5

Table C.7. Tremaine Complex Jar Spatial and Use-Alteration Data							
Vessel #	**Site**	**Prov.**	**Spatial Zone**	**Part of Vessel**	**Ext. Sooting**	**Int. Carbonization**	**Functional Category**
F1V1	Tremaine	F1 L7-1	N/A	rim-shoulder	1	2b	2
F5V1	Tremaine	F5 L10-1	N/A	rim-shoulder	3b	2b	2
F51V1	Tremaine	F51 L4-5	N/A	rim-shoulder	1	2b	2
F59V1	Tremaine	F59 L3-8.1	3	rim-shoulder	3b	7b	5
F59V2	Tremaine	F59 L3-6	3	rim-shoulder	1	2b	2
F108V1	Tremaine	F108 L3-4	2	rim-shoulder	5b	7b	5
F145V3	Tremaine	F145 L1-7	3	rim-shoulder	2a	4b	4
F145V4	Tremaine	F145 L4-2	3	rim-shoulder	3a	4b	4
F155V1	Tremaine	F155	2	rim-side	3b	4b	4
F223V1	Tremaine	F223 L3-6	2	rim-shoulder	2b	2b	2
F237V1	Tremaine	F237 L3-4	3	rim-shoulder	3c	4b	4
F238V1	Tremaine	F238 L2	1	neck-shoulder	3c	7b	5
F259V1	Tremaine	F259 L5-2	3	rim-shoulder	1	1	1
F259V3	Tremaine	F259 L1-4	3	rim-shoulder	1	5	4
F317V2	Tremaine	F317 L1-3	3	rim-shoulder	1	7b	5
F319V2	Tremaine	F319 L1-7	?	rim-shoulder	1	1	1
F334V1	Tremaine	F334 L3-3 L4-2	3	rim-shoulder	2b	1	8
F336V2	Tremaine	F336 L3-2	3	rim-shoulder	3c	7b	5
F338V1	Tremaine	F338 L2-4	3	rim-shoulder	3b	2b	2
F346V1	Tremaine	F346 L7-1	3	rim-shoulder	3c	7b	5
F348V1?	Tremaine	F348 L3-3	2	rim-shoulder	2a	2b	2
F348V2	Tremaine	F348 L3-2	2	rim-side	3a	4b	4
F348V3	Tremaine	F348 L3-1	2	rim-side	2a	2b	2
F348V5	Tremaine	F348 L2-4 L3-4	2	rim-shoulder	3c	4a	4
F367V1	Tremaine	F367	3	rim-shoulder	3a	2b	2
F367 NVS-1	Tremaine	F367	3	neck-shoulder	3a	2b	2
F368V1	Tremaine	F368 L4-3	3	rim-shoulder	1	7b	5
F368V2	Tremaine	F368 L4-4	3	rim-side	5a	5	5
F400V4	Tremaine	F400 L5-2	3	rim-shoulder	1	1	1
F400V5	Tremaine	F400 L9-1	3	rim-shoulder	3b	1	8
F402V1	Tremaine	F402 AGS-1,2,3	2	rim-shoulder	3a	2b	2
F415V1	Tremaine	F415 L1-4	1	rim-shoulder	1	1	1
F448V1	Tremaine	F448 L1/2-1	3	rim-shoulder	1	1	1

Table C.7 (Cont'd).

Vessel #	Site	Prov.	Spatial Zone	Part of Vessel	Ext. Sooting	Int. Carbonization	Functional Category
F461V2	Tremaine	F461	3	rim-side	1	2b	2
F462V2	Tremaine	F462 AGS-5	3	rim-shoulder	3b	7a	5
F473V1	Tremaine	F473 L2-2	3	rim-side	3c	7b	5
F537V1	Tremaine	F537 L1-2,3	2	rim-shoulder	2b	2b	2
F599V1	Tremaine	F599 L1-8	3	rim-shoulder	3b	7a	5
F599V2	Tremaine	F599 L1-7.1	3	rim-shoulder	1	2b	2
F613V1	Tremaine	F613 L6-4.1	2	rim-side	1	1	1
F648V4	Tremaine	F648 L3	3	rim-shoulder	3b	4b	4
F692V1	Tremaine	F692 L1-15,16,19,209	3	rim-shoulder	1	3b	3
F698V1	Tremaine	F698 L4-5	3	rim-shoulder	1	1	1
F735V1	Tremaine	F735 L2-2.1	3	rim-shoulder	3c	3a	3
F963V1	Tremaine	F963 0-69cm-1	1	rim-shoulder	2b	7a	5
F3V?	OT	F3 L12	N/A	rim-side	2b	7a	5
F3V1	OT	F3 L9	N/A	rim-shoulder	3c	4b	4
F3V7	OT	F3 L8	N/A	rim-shoulder	3a	2a	2
F43V1	OT	F43 L11	N/A	rim-shoulder	3b	2b	2
F46V2	OT	F46 L1	N/A	rim-shoulder	3b	2b	2
F55V3	OT	F55 L3	N/A	rim-side	2b	1	8
F91V2	OT	F91 L3	N/A	rim-side	2b	1	8
F113V1	OT	F113 L5	N/A	rim-shoulder	3b	5	5

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