

5-2018

Got Breadfruit? Marshallese Foodways and Culture in Springdale, Arkansas

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Got Breadfruit? Marshallese Foodways and Culture in Springdale, Arkansas

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Environmental Dynamics

by

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ABSTRACT

Understanding human food choices is essential in the examination of cultural knowledge and decision-making among members of any ethnic group. Ethnographic and cognitive anthropology methods, including a novel calculation of cognitive salience, were used in this study to explore the domain of traditional Marshallese foods in Springdale, Arkansas.

Springdale is home to the highest population of Marshallese people outside of the Republic of the Marshall Islands (RMI); the population is expected to rise as people continue to migrate from the RMI because of global climate change and other factors such as family ties. Studies of traditional foodways are increasingly crucial in social science because they offer a relevant lens for examining beliefs, behaviors, and other biocultural elements binding people together. This study is the first to examine traditional Marshallese foods in the diasporic context. It is also significant from health and nutritional perspectives because Marshallese people are at high risk for diet related diseases, such as type II diabetes. Breadfruit, long a standard starchy staple of Marshallese cuisine, was discovered to be the most important and socially shared traditional Marshallese food. Although breadfruit is gaining popularity in Western markets as a healthy superfood on par with kale and açai, it is not yet readily available for purchase in Springdale. The practice of substituting higher-Glycemic Index (GI) white rice for lower-GI breadfruit began in the RMI during the 1930s and has carried over to the Springdale community today, where 46.5% of Marshallese adults have type II diabetes (a disease associated with higher dietary GI). The fact that breadfruit has such high cultural value and salience, despite infrequent consumption, represents Marshallese concepts of dietary change and constancy. Ultimately, the results of this work serve to illustrate how human diasporic groups adapt and respond to dramatic socio-ecological changes and challenges through culturally-constructed food beliefs, preferences, and consumption patterns.

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ACKNOWLEDGEMENTS

This dissertation is the product of years of hard work. I did some of it, but there were many wonderful people who consistently supported me, working equally hard at editing, babysitting, guiding, encouraging, teaching, and translating for me. Primarily, I thank my advisor, Dr. Justin Nolan. Boss, you are the greatest example of a leader and instructor whom I have ever had the pleasure to encounter. You must be my fairy godfather because you have made my dream come true. I also wish to thank my committee members, Dr. Jamie Baum and Dr. Peter Ungar, for their patience and support, and for being excellent spiritual and academic role models. *Todah raba*, Dr. Baum, for the dissertation topic. Dr. Ungar, *todah raba* to you for encouraging me during my time as a graduate student in the Environmental Dynamics program. I would like to thank Dr. Mike Robbins as well for teaching me about cognitive salience. I also owe a great debt to Jo Ann Kvamme for her help and friendship. My family and friends have been my invaluable support network. I especially thank my husband, David Chen, and our parents, Julie Chen, Hseuh-Hsin Chen, Nina Storch, and Daniel Storch, for the hours of childcare they provided. This project was only possible with the great support of the Marshallese community in Springdale and beyond. *Kom̧m̧ool tata ri-Majol*. Finally, I am honored to thank the Society of Ethnobiology for the 2016 Urban Ethnobiology award that helped fund this project.

DEDICATION

To Violet – My light, my hope, my heart.

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INTRODUCTION

“Our food is our culture. We have our own food, and we are carrying that from the Islands to America.”

Thirty year old man from *Namdik* Atoll, Republic of the Marshall Islands

‘Please, not another study of food and identity!’

Sutton (2001:163)

Across the Ocean

By all accounts the Marshall Islands appear suddenly just as one’s plane descends toward the blue expanse of the Northern Pacific Ocean. The country’s less developed “Outer Islands” shine like jewels, they say, although I have yet to visit the Islands myself. In overexposed photos taken before the 1990s, the Marshall Islands look unappealingly gray. North American visitors repeatedly wrote scathing critiques of their crowded, garbage-strewn “Urban Centers”, Mājro and Ebeye (Kluge, 1991; Nakano, 1983). The Islands seemed like a far cry from the idyllic image of the Pacific painted by Gauguin (b.1848-d.1903) in the southernly islands of French Polynesia.

For two decades the Marshall Islands were part of a US territory, designated specifically as a nuclear weapons test site. Henry Kissinger explained in 1969, “There are only 90,000 people out there [in the entire US Micronesian Territory]. *Who gives a damn?*” However, modern GIS (Geographic Information Systems) and high resolution photographic imagery and post-colonial writings reveal both the beauty and the complexity of the RMI (Republic of the Marshall Islands).

Global climate change, rising sea levels, loss of biodiversity, extreme food insecurity, and other factors are motivating increasing numbers of Marshallese people to migrate to America - to Springdale, AR in particular. As the Earth heats up, the Marshall Islands are

becoming a hot topic. And the sociocultural consequences of these changes are even more salient to anthropologists and human geographers (Davis, 2014).

My first glimpse of the true colors of the RMI, when I finally understood why my friends described it as the most beautiful place they have ever been, was in a Marshallese language and culture class in Springdale. One evening my class watched Jack Niedenthal's short film, *Zori* (Microwave Films, 2013), about a boy on *Mājro* Atoll who loses a flipflop. The colors in the film were vivid jungle green and sky blue – breathtaking! I could see what a special place the RMI is. The tropical sun illuminates the islands like a spotlight, the language bubbles up from the throat, and the people are fiercely loving of their extended families. Of course. In Springdale there is a different kind of landscape, language, and culture – which includes different foods and foodways – than in the RMI. Yet various factors have worked to make the town of Springdale, AR home to the largest Marshallese population (over 10,000 people) outside of the RMI.

a)



b)

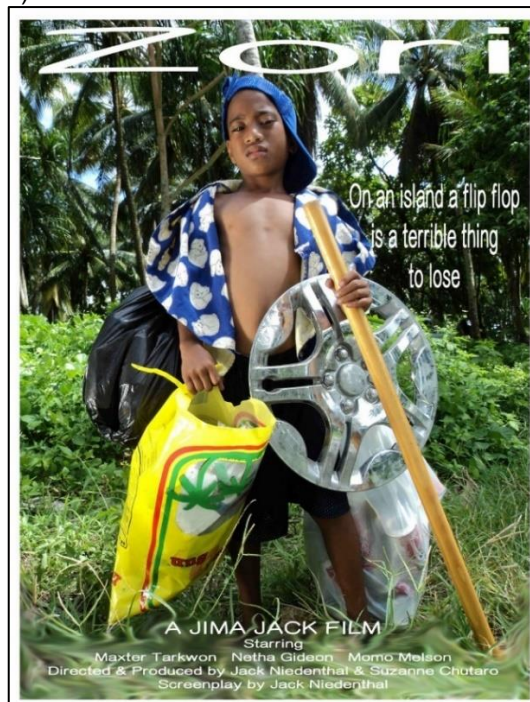


Figure 0.1. a) Photo by Melinda Berge from *National Geographic Magazine* vol.170(4):474, 1986. b) Promotional Poster for *Zori*. Note the striking differences in color and composition, symbolic of the changing view of the RMI.

Of all the towns along I-49, the main artery through Northwest Arkansas (NWA), Springdale is the most industrialized, the most diverse, and the least gentrified. Its historic downtown main street, Emma Avenue, is lined with a mix of buildings. Some are vacant, some house hip and hopeful small businesses, or community organizations, or representations of the past. The latter include antique stores, a few enduring eateries (a cake shop, a grill, a taco stand), and the Shiloh Museum of Ozark History. The streets branching away from Emma are more commercialized, yet just as utilitarian as those downtown. Springdale is one of the largest towns in NWA. It's total population of almost 80,000 is about 30% greater than that of the entire RMI.

Although many Euro-Americans cannot tell them apart from Latinos (Springdale's largest ethnic group at over a third of its total population), Marshallese residents are slowly assimilating into the broader community and molding it in various ways, in much the same way they have molded their island environments. Pacific Islanders make up about 10% of Springdale's relatively diverse total population.

The Marshallese community in Springdale, which some estimate numbers as high as 14,000 people, began with a single Islander named John Moody. His story is semi-shrouded in legendry. In the 1980s, Moody ended up in NWA after a brief visit to neighboring Oklahoma. He found work at the Tyson poultry plant and sent word back to his friends and family in the Islands to join him in Springdale. And very soon after, they did. Marshallese people in the US are referred to as "migrants", not "immigrants", revealing their liminal sociopolitical status. The status of Marshallese migrants in the US is quite complicated due to a special agreement the two countries devised back in the 1980s. The agreement, called the Compact of Free Association (COFA), granted new rights to the RMI as a (semi) sovereign country. One of the rules laid out in the COFA allows Marshallese citizens to freely live and work in the US. However, they are not considered US citizens. Marshallese people in Springdale do pay taxes. Some of them do serve in the US military. Yet, in Arkansas they are ineligible for programs

such as Medicaid and the Supplemental Nutrition Assistance Program (SNAP) (McElfish et al., 2016; Blair, 2015). The process is more difficult for Marshallese migrants to officially become US citizens than it is for other foreign people because of the COFA, due to lack of precedents.

Anthropogenic activity, mainly that of Western nations including the US, has caused unprecedented global climate change. The RMI is already feeling effects: Ocean acidification, violent typhoons, and sea level rise. Inundation and erosion are slowly taking away invaluable land area from the diminutive Marshallese atolls, threatening to crack open a nuclear waste repository on *Āne-wātak* Atoll, and prompting increasing migration from the shrinking country. In general, when people move to new regions, they maintain their home foodways for longer than they retain other key aspects of their culture such as language. In Springdale, one can buy the same Calrose brand rice, Ox and Palm brand canned corned beef, and Kopiko brand instant coffee familiar to people from the RMI. Obviously however, not all species of reef fish or endemic varieties of Marshallese fruits are available in NWA. Marshallese people love to joke about their visiting relatives bringing coolers full of Island food. At the Northwest Arkansas Regional Airport (XNA), Marshallese people decked out in colorful Hawaiian shirts and mumus, wearing flip flops even in winter, can indeed be seen hauling multiple coolers off the conveyor belt at the baggage claim.

The culinary culture of Springdale is not fancy, featuring typical working-class offerings. A friend of mine who worked at a bank in Springdale complained about the dearth of lunch break restaurant choices there: Greasy fast food chains or tacos (really, really good tacos). A couple small, specifically Marshallese grocery stores sell a handful of prepared Marshallese foods: *jal tutu* (fish in coconut sauce), iced *lukor* (coconut ice cream), *tonaaj* (semi-sweet donuts), fish jerky, banana bread, and perhaps more. Currently however, there are no Marshallese restaurants in Springdale. Marshallese style box lunches are often sold as fundraisers for local sports teams and Marshallese churches (there are over 30 Marshallese churches in Springdale). A five-dollar donation is likely to buy a Styrofoam container packed

with white rice and BBQed meats (usually chicken) marinated in soy sauce, sometimes accompanied by a mayonnaise-laden salad or semi-sweet donut/cinnamon roll. A similar style of food features in the Marshallese feasts held at church events, funerals, and *keemems* (first birthday celebrations as raucous as Jewish *bar mitzvahs*). While delicious, many popular foods enjoyed by the Marshallese community in Springdale are not considered healthy by Western nutritionists. Pacific Islanders have an extremely high incidence of type II diabetes, a disease that may be controlled through diet. According to McElfish et al. (2016), 46.5% of Marshallese adults in Arkansas have type II diabetes, with an additional 21.4% of the population having pre-diabetes (the state of being at extremely high risk of developing the full-blown disease). Some barriers to medical treatment for Marshallese people in Springdale include language barriers, cultural beliefs about health, and expenses.

The Problem and Scope of Work

Although the NWA Marshallese community is relatively new, continued growth is predicted (Davis, 2014; Campbell, 2014). Optimistically, Springdale is on track to become a cultural hub on par with the Chinatowns of San Francisco or New York. Or, as the Marshallese say, “A new island.” Visitors to Springdale can shop for beautiful Marshallese handicrafts, sample iced *lukor*, and view Marshallese musical performances several times per year (Figure 0.2).

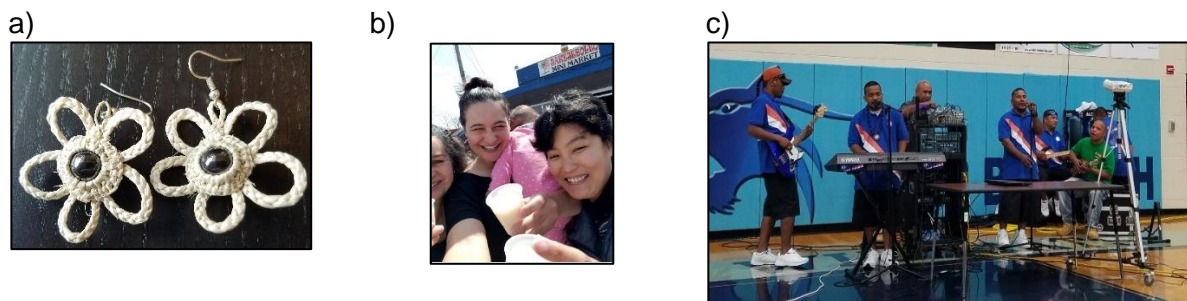


Figure 0.2. a) Marshallese-made earrings, b) enjoying iced *lukor* on a hot day, and c) Marshallese band performing in Springdale

However, many challenges remain for the Marshallese community in Springdale to overcome, including language barriers, displacement, lingering and alienating culture shock, homesickness, public health crises, and overcomplicated political status.

Dissertation Goals

The overarching goal of this dissertation is to fill the gaps in the literature on foodways and Marshallese Studies by developing the most comprehensive and nuanced portrait of Marshallese food traditions. The idea that foodways are symbolic of cultural identity has been well-studied within the past few decades by scholars from varied fields of study, including ethnobotany (the study of how different cultures use their local plants). This work builds upon the existing theory by employing the methods of cognitive anthropology, and its close relative, cognitive ethnobotany. Cotton (1996) distinguishes cognitive ethnobotany as the subfield of ethnobotany devoted to plant food sources and human thoughts. It is an important and forward-looking form of study concerned with how knowledge of the natural world is structured in a given cultural group. Cognitive anthropology (and cognitive ethnobotany) methods such as free-listing and pile sorting may be used to answer questions such as: What food items are considered the most “Marshallese”? How are the items ranked and related, and does it really matter? And how is knowledge of these items distributed among group members? Answers to these questions potentially illuminate how human social adaptation through foodways is occurring as populations of ethnic groups shift away from their homelands.

The specific questions that prompted this research project were: What are the most important items that comprise the domain of traditional Marshallese foods? How have Marshallese foodways responded to colonialism and globalization? How is knowledge about traditional Marshallese foodways distributed throughout the community in Springdale? And how do Marshallese people in Springdale use foodways to perform group identity? These questions were used as guidelines for the exploration of Marshallese foodways and culture in Springdale.

There are four main goals of this study: The first is to provide a snapshot of Marshallese foodways at this point in time (the first generation of Marshallese-Americans to be born here are now in grade school). The second goal is to determine how Marshallese foodways have changed, and how they have remained the same across space and time. The third goal is to analyze how Marshallese people think about their traditional foodways, or those foods and food practices that are ritualized and repeated, for the purposes of teaching values and with the implication of some sort of historical connection (Hobsbawm and Ranger, 1983). Lastly, the fourth goal is to explore the symbolic aspects of some traditional Marshallese foods. What do specific foods signify in Marshallese culture and thought? This, I came to realize, would be the most challenging goal of all.

Importance of the Study

Just as my TV has been taken over by shows about cooking (“Top Chef”, “Chopped”), food (“The Chew”, “Cake Boss”), and eating (“Restaurant Impossible”), my bookshelf is lined with cookbooks (“Jewish Cooking in America”, “The Joy of Cooking”), readers (“Eating on the Wild Side”, “Food: Ethnographic Encounters”) ethnographies (“Uncertain Tastes”), cultural histories (“Sweetness and Power”, “Uncommon Grounds”), exposés (“Fast Food Nation”), and fiction (“Like Water for Chocolate”, “Monsoon Diary”) about food. Food is a trendy topic these days in popular media and in academic disciplines ranging from folklore to genetics to political science. American anthropologists have been conducting foodways research since the field’s founding father, Franz Boas, recorded Kwakiutl recipes for salmon in 1921 (Mintz and Du Bois, 2002). However, interest in the topic of food and culture has expanded exponentially in recent decades. Scholars have finally realized that the power of food is not merely its ability to energize the human body, but also its role in almost every aspect of human life and culture. One of the metaphors that has been firmly established is between food and identity. In this

dissertation I will discuss *keemems* as a unique way in which Marshallese foodways serve to represent the group's cultural identity. In addition to the qualitative methods of anthropology, cognitive anthropology employs some quantitative methods. (It might be called "the hardest of the soft sciences.") In this project, I will use both existing software and a newer method designed by Robbins et al. (2017) to calculate Saliency (B and B' respectively). In doing so, I hope to demonstrate an improvement in cognitive anthropology research methods, and to determine the importance of certain foods to the Marshallese population in Springdale.

Although the Marshallese community in Springdale has been the subject of countless research projects by students from the University of Arkansas in neighboring Fayetteville and by others, foodways have yet to be thoroughly explored and documented in the literature. Documentation is important for posterity, for history, and for informing public health programs. I will do my best to describe the current foodways of the Marshallese community in Springdale. This kind of work is reminiscent of the earliest period of ethnobiology as a discipline. During the first half of the 20th century, which Hunn (2007) refers to as "Ethnobiology I", the founding fathers (and mothers) of ethnobiology were concerned with documenting Traditional Ecological Knowledge (TEK), the knowledge of the natural world that is passed down between generations of a given group of people, for cultural preservation and promotion. I am choosing to anchor this dissertation in the field of ethnobiology because I passionately believe in the potential of this kind of research to ameliorate the degraded environments most humans live in today. Since the 1950s ethnobiology has advanced through three additional phases identified by Hunn, and a fifth phase suggested by Wyndham et al. (2011) and others. It is now much more than just collecting TEK. Cultural preservation is still important, even if it's now acknowledged that culture, the values, beliefs, and behaviors that are intergenerationally transmitted within a group (Bonvillain, 2006), is dynamic and will never be able to be kept preserved like "a stuffed gorilla in a museum (Wendt, 1982:206)." Cultural sharing and promotion are also important. And the preservation and propagation of Marshallese culture in Springdale are not just important, they

are urgent because the effects of climate change are happening now. An ethnographic snapshot will ensure that Marshallese culture as it settles into Springdale can be remembered, discovered, and enjoyed by present and future generations.

Background of the Study

The history of dining in the Marshall Islands is quite complex. Before humans settled there 2,000 years ago, the vegetation available for primary consumer birds and fish was probably limited. The first settlers brought some additional plants and animals with them. Eventually, they constructed a unique cuisine based on breadfruit/pandanus (the starch), seafood (the protein), and coconut (the fat). They had various methods of preparing and cooking their food as well as for food production and resource management. Then, in the 1500s, Islanders encountered the foodways of European sailors. The first Europeans to interact with the Marshallese people were from Spain, but a series of foreign visitors (including Otto von Kotzebue, a Russian determined to “improve” Marshallese agriculture) ensued, until the colonization of the Islands by Germany in the late 1800s. Similar to their *laissez faire* style of colonial governance, the Germans did not directly convert the palettes of the Marshallese people. However, their rule caused a lot of social and environmental changes that altered the future of the Marshallese diet. On the other hand, when the Japanese took over the Marshallese government after the Germans, they had a more significant impact on both politics and food choice. Japanese contributions to Marshallese foodways included cane sugar and white rice. Of course, the start of the most significant changes to Marshallese cuisine was the WWII era American administration. Military rations like SPAM and other canned meats, candy bars, and coffee were viewed by the Marshallese in the same positive light as the Americans who defeated the Japanese. Although the RMI became an (somewhat) independent nation in the late 1980s, the population remains dependent on imports, including Japanese rice and

American soft drinks. The food production and preparation practices of the pre-contact Marshallese have been largely abandoned, especially in the Urban Centers where there are more grocery stores.

Another Marshallese joke is that the reason so many Marshallese people live in Springdale, AR is because they like chicken and rice. Arkansas is the largest producer of rice in the US and the second largest producer of broilers (chickens raised for meat) in the US. Springdale has several large poultry processing plants where many Marshallese people work. It is as if chicken has taken over the “protein” position initially held by seafood in the Marshallese diet. However, to then say that rice has taken over the “staple starch” position of breadfruit is a loaded statement. For many Micronesians, the conflict between breadfruit and rice is the same as that between old ways, or internal culture, and new ways, or external/foreign culture. While breadfruit may be occasionally available for purchase in Springdale, my friends tell me wistfully that it’s not the same as the breadfruit in the RMI. The taste and texture are different. Therefore, it can be difficult to impossible to replicate Marshallese home cooking. But that doesn’t keep Marshallese people from cooking in the kitchens of their homes in Springdale.

Indeed, in Springdale today youth and community leaders are interested in reviving Marshallese food traditions. Part of the determination may be attributed to a cultural revival. For example, in a tent on the side lawn of the Shiloh Museum of Ozark History in downtown Springdale, efforts are underway to build a traditional-style Marshallese mid-sized outrigger canoe, or *kōrkōr*. Although Arkansas is a landlocked state, it is not without bodies of water such as Beaver Lake, a large reservoir near Springdale. Miller (2010) shows that the canoe is an important part of Marshallese culture and identity. Traditionally, it would be carved from the trunk of a breadfruit tree. However, as it would have been quite impractical to get such a large, heavy material from the Tropics to Springdale, the Arkansas *kōrkōr* is being made from the trunk of a native sycamore. Sailing Marshallese canoes Beaver Lake is a way for migrants from the Islands to resituate their culture within a new environment. Like the canoe, food is a

tangible connection to the home country. Therefore, eating Marshallese food in Arkansas may help alleviate homesickness. Additionally, research has shown that “traditional” foods are beneficial to the health of indigenous people, especially in the case of type II diabetes (Nabhan, 2008). Marshallese foods such as reef fish and breadfruit may continue to gain popularity for their healthy qualities. Indeed, breadfruit and its products have recently crept into the “superfoods” sections of non-Marshallese marketplaces because they are novel, nutritious, and gluten-free. For example, Whole Foods supermarkets in Hawaii sell breadfruit products, including “pono pie”, a dessert concoction of breadfruit and honey (Fawcett, 2016).

Unfortunately, some varieties of breadfruit and other plants that thrive in the RMI will likely be out of commission for an indefinite amount of time. Increasing soil salinity, soil acidity, drought conditions, flood conditions, powerful typhoons, and sea level rise all threaten Marshallese vegetation due to climate change. Additionally, waste management and land “development” also negatively affect biodiversity. As the Islands slowly become uninhabitable, endangered germplasm will have to go into cold storage in Svalbard (which is only somewhat of a less precarious location). As for the water, Marshallese fisheries are already suffering from over-exploitation, pollution, increased ocean temperatures, increased ocean acidity, and ecological alterations. Sea turtles, *wōn*, are still a prestigious Marshallese food although they are now endangered. Thus, even though many Marshallese people, like those of other cultures, may wish for a cultural revival, in the case of some key foods it may not be possible.

Old and new may have different meaning for Marshallese people, who traditionally view time in a more cyclical manner than Westerners. They accept that things may change profoundly, like the rise and fall of the ocean tide. The tide is however, a part of the larger ocean, which remains fairly constant. Thus, for Marshallese people, there is not as much of a dichotomy between the old and the new as Westerners assume. The two states may coexist. Rice, chicken, and SPAM can all be traditional Marshallese foods. Springdale can be a new island.

The subject of foodways, the various edibles consumed by a given population, plus how those foods are collected, prepared, and eaten, as a dissertation topic was inspired by my major advisor, Dr. Justin Nolan. The focus on the Marshallese community in Springdale was suggested by my dissertation committee member, Dr. Jamie Baum. Dr. Nolan also encouraged me to use the methods of cognitive anthropology, to ascertain how cultural knowledge of food traditions is distributed within the study population.

Associations with Cognitive Anthropology

Cognitive anthropology, “the study of the relation between human society and human thought (D’Andrade, 1995:1)”, has some roots in ethnobotany. In the 1970s, researchers such as Brent Berlin, Dennis Breedlove, and Peter Raven (1973) began to use the methods of cognitive anthropology to construct folk taxonomies (indigenous classification structures) for plants. Cognitive anthropology methods include free-listing and pile-sorting. These are techniques that have been used since the 1960s to ascertain the verbal, culturally-constructed components of cultural domains, such as food, edible animals, poisonous and medicinal plants, types of firewood, and dozens of other semantic categories in languages and cultures across the world (e.g. Ellen, 2006). Classic ethnographic works have deployed these methods of “cultural domain analysis” to understand how cultural information is cognitively distributed, or socially shared, throughout members of any given study population (Quinlan, 2005). In the present study, techniques from cognitive anthropology helped to ascertain a full constellation of what Marshallese foods are comprised of, and how knowing about and sharing these foods indeed connects members within this ethnic community, or sets them apart from others. By providing a collective, cognitive portrait of food culture and knowledge, methods of cultural domain analysis proved necessary for eliciting a comprehensive repertoire of culinary knowledge, which in turn can possibly serve to sustain the lifeways, language, and

understandings of this cultural group residing so very far away from their homeland (Robbins, Nolan, and Chen, 2017).

Organization of this Dissertation

This work begins with four chapters of literature review. The first chapter summarizes the geography, history, and culture of both the RMI and Springdale. The second chapter then broadly covers the important biological and cultural aspects of foodways in general, as well as the importance of traditional cuisines. The third chapter specifically focuses on foodways in the RMI and Springdale. The literature review concludes with a fourth chapter on the methods and theory with a focus on cognitive anthropology. The remaining chapters of this dissertation are based on my own research. Chapter five offers brief descriptions of some especially salient Marshallese foods. Chapter six is about free-listing. Next, chapter seven is about pile-sorting. Chapter eight details the survey results with a look at cultural consensus. Finally, chapter nine explores the expressive components of this research. A brief conclusion will summarize the major points and contributions of this work, as well as make suggestions for future research. Readers may find additional information, such as a glossary of Marshallese terms, in the appendices.

My biggest challenge in writing this dissertation has been my relative ignorance of the Marshallese language. Where appropriate, I will use Marshallese words from Abo et al. (1976) which is considered to be the best Marshallese language resource available, even though there is no official standard for spelling. Although the Marshall Islands are spread out over a huge area of ocean, resulting in many different dialects, and sometimes different common names for things, there is only one Marshallese language that is pretty much understood by everyone in the country.

Up until the 1980s, “nearly all the literature about Oceania was written by *papalagi* [the Samoan term for Europeans and Americans] and other outsiders (Wendt, 1982:213).” I am one of those outsiders writing about Pacific culture. I have an ulterior motive in completing this project (to earn an advanced degree). Yet even as Wendt (1982) calls for more indigenous perspectives, he explicitly states that Pacific scholars of all backgrounds are welcome, as long as they write from a place of *aroha/aloha/alofa/loloma*, Polynesian terms again which I interpret to mean love and respect. So, in writing this dissertation, I wish to express the love and respect I have for my Marshallese friends and their families. *Kom̧m̧ool tata* for sharing your *m̧anit majol*.

SETTING

Jepelpel in ke eju kāān.

Motto of the Republic of the Marshall Islands, meaning that the Islands and their people are unified (like a stand of coconut trees) even though they are separated by vast Ocean distances (Stone et al., 2000)

This chapter describes the history of the study community and their environment. This information is important for a full understanding of the especially dynamic nature of Marshallese culture, including their foodways. From the first people who set foot on the islands and their select natural resources, through occupations by Germans, Japanese, and Americans, to the far shores of “Chickendale” (an affectionate nickname for Springdale), Arkansas, Marshallese foodways have been impacted by many different factors. Certain core traditions remain intact, however. For example, starchy carbohydrates are still the primary food, and food is still distributed in copious amounts at special events such as *keemems*. No doubt such enduring facets of Marshallese culture will persist far into the future, yet they will not do so without challenges. To point out just a couple of these obstacles: The Marshallese community in Arkansas faces diet-related public health issues such as an extraordinarily high incidence of diabetes. And rising seas threaten to submerge culturally important endemic plant varieties.

The Republic of the Marshall Islands

Geography

The Pacific Ocean is the largest body of water on Earth. It contains the region of islands called Oceania, which has been further arbitrarily subdivided into three geographical and cultural groups known as Melanesia, Polynesia, and Micronesia. These three groupings were constructed in the early 19th century for the convenience of Western “explorers” and do not reflect any defensible cultural or ecological divides. The name “Micronesia” stems from the very

small size of the islands and atolls in this vast ocean area. It is a diminutive colonial term that represents a European view of the islands. However, out of convention, the term is still used. The Micronesian countries today are Palau, Kiribati, Nauru, the Federated States of Micronesia, and the Republic of the Marshall Islands (RMI). In addition, the region contains three US territories: Guam, the Commonwealth of the Northern Mariana Islands, and Wake Island (which is also claimed by the RMI). Figure 1.1 shows the region of Micronesia.

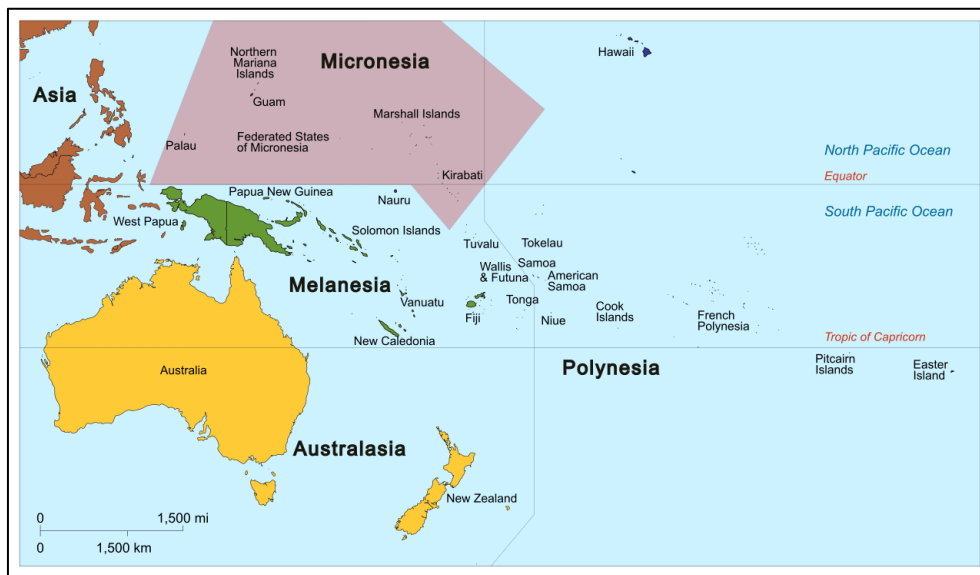


Figure 1.1. The Micronesian region highlighted in purple



Figure 1.2. Map of the RMI (Displaying Non-Standardized Atoll Names)

The RMI, as the country has been known since it was granted some semblance of autonomy in 1979, is a far-flung group of coral atolls and tiny islands nestled in the tropical North Pacific (See figure 1.2 above, a map of the country). The political boundaries of the country, and of course the name "Marshall" were determined by European colonial powers (Hezel, 1983). To the early Islanders, political boundaries were dynamic and the country was called *Aelōn Kein Ad*, "These Our Atolls". Today the Marshallese word for their country is *Majol*, a cognate for "Marshall". Marshallese and English are the two official languages of the RMI. In this dissertation, I use the term "Marshallese" to describe both the language and the people of the RMI. I chose the term "Marshallese" because it is more frequently used in the study community to describe the people than "Marshall Islanders" or synonymous terms of identification.

Five true islands ("table reefs") and twenty-nine atolls (fractured into thousands of tiny "islets" or *motu*) are in the RMI. A coral atoll is essentially a ring of reef and mini-islands (islets) surrounding a central lagoon. For Marshallese islets, the reef areas are often bigger than the dry land areas (Harris et al., 2016). Atolls and islands are formed differently, resulting in different topographies. The lagoons that atolls have make them easier to access by watercraft in addition to making better fishing grounds than the open ocean. The scattered atolls and islands of the Marshalls are arranged northwest to southeast in two parallel archipelagos. The easternmost chain is called *Ratak*, the Sunrise chain. It contains the current capitol, *Mājro* (*Mājro* Atoll). The *Ralik*, Sunset, chain to the west contains the atolls *Kuwajleen* (largest lagoon in the world) and *Jālooj* (former capitol), to name just a few. In the far northwest of the country there are two additional atolls, slightly off the *Ralik* track, *Āne-wātak* (former US nuclear test site, current location of the *Runit* Dome filled with radioactive material), and *Wūjlañ*.

The country is unfortunately close to the rising sea level. The average elevation of the RMI is only about 2 meters, with the highest point being a sand dune on *Likiep* Atoll that is less than 10 meters tall.

Climate

The RMI is located entirely within the Tropic of Cancer, just above the equator. Its climate is relatively steady. "There was no need for a weatherman in the Marshall Islands, because tomorrow would always be hot, humid, and partly cloudy, with a chance of rain (Rudiak-Gould, 2009:76)." Temperatures hover around 80°F (27°C) year-round. Winds do much to dispel the heat, especially the northeast trade wind. The major annual change in climatic conditions is due as well to winds. Winter is the drier, windy season, *añōneañ*, with the wind blowing from the northeast. Summer is the calmer season (Spoeh, 1949), *rak* (Pollock, 1992), with winds from the west and southwest. Summer is the best time for voyaging (Pollock, 1992; D'Arcy, 2006). In the past it was also known as *Itōknonu*, the time of many flies (Tobin, 2002). While there may be little climatic variability, seasons are marked by the fruiting of various trees and other edible species. For example, breadfruit (*Artocarpus altilis*) is plentiful during the summer, giving way to pandanus (*Pandanus fischerianus*) in the fall/winter (Tobin, 2002). Summer is also a good time for fishing (D'Arcy, 2006). Before European contact, Marshallese people counted "years" by *añōneañ* (Tobin, 2002). Their concept of time was cyclical (Miller, 2010).

Annual rainfall increases as one journeys south through the RMI. *Eneen-Kio* Atoll, also known as Wake Island and jointly claimed by the United States, is the northernmost and driest part of the RMI (Terry and Thaman, 2008), as well as the coolest. Other northerly atolls have not been permanently inhabited because of their vulnerability to droughts. The predominant food plants in the Northern part of the country are the relatively drought and salt-tolerant coconut (*Cocos nucifera*) and pandanus. The north, as well as the west, of the country is also vulnerable to typhoons (which tend to skip those atolls closer to the equator). Severe tropical storms occur in the Marshalls once or twice per decade, especially during positive El Niño-Southern Oscillation (ENSO) years (Terry and Thaman, 2008). ENSO refers to a cyclically-

occurring year or two when the water at the surface of the Ocean is warmer than average. These events happen every three to seven years, bringing excessive rain to the Marshall Islands (D'Arcy, 2006).

Although the Marshall Islands mainly consist of sun-drenched tropical beaches (approximately 2,000 km of shoreline, according the World Resources Institute (2012)) with shining coral sands and swaying palm trees, extremely low biodiversity there hinders human habitability. The soils are some of the world's worst, generally lacking in nutrients for plants and having high pH and salinity levels. In addition, war, development, and introduction of invasive species have further degraded the native ecosystems (Thaman, 2008). However, pockets of naturally fertile soil do exist on the atolls, beneath certain trees and toward the interior of the land. In addition, there may be man-made taro (*Cyrtosperma chamioosis*) mucks, or *bōl* (traditional patches of fertile soil) or gardens (modern patches of fertile soil) (Terry and Thaman, 2008; Thaman, 2008).

Although the Marshall Islands are surrounded by water, they have no natural streams or ponds or any other surface-level fresh water sources. All of the potable water comes out of the freshwater lenses floating just under the surfaces of the atolls (Terry and Thaman, 2008). This limits the distribution of vegetation on the atolls as well as where people choose to live and make their taro pits. The freshwater lenses are usually deepest in the interior of the landmasses. Fresh water falls on the Marshall Islands as rain and percolates through the soil to sea level. Since fresh water is lighter than saltwater, the rainwater floats on top, forming a "lens". This freshwater lens is deeper in the center of the atoll and at the edges of the land, it drains into the sea (Wenkam and Baker, 1971). For example, on Mājro Atoll, the freshwater lens is deepest in Laura. Although the village's current name comes from US GIs during WWII who were honoring the actress Lauren Bacall, it is the site of some of the oldest archeological evidence of human settlement in the Marshall Islands.

The Marshall Islands host no endemic species, a testament to their lack of habitat diversity and harsh living environment (Thaman, 2008). Most of the plants that grow there today were introduced since European contact, although a small percentage are indigenous Pacific species (Thaman, 2008). Since the Islands have a low biodiversity, the people who have lived there for centuries have made full use of all the resources they had. Many plants, especially trees, have been found to be bioculturally useful as food, medicine, material resources, dyes, and insect repellents, in addition to their purely cultural uses such as “lovemaking sites” (Thaman, 2008:58). The plants of the RMI – especially the indigenous species - also have various ecological uses that must not be overlooked such as erosion control, animal habitats, mulch, and so on (Thaman, 2008).

Ancient Natural History of the Islands

The Marshall Islands began to form near the end of the Mesozoic Era, some 75 million years ago (Terry and Thaman, 2008), however, they were not ready for human occupation until about 2,000 years ago (Thomas, 2008). Some wild radiocarbon dates from Pikinni Atoll suggests a much longer history of habitation (3,500 years), but they are not considered accurate. Inaccuracies in carbon dating may result from testing foreign materials such as driftwood, and of course from lingering radioactivity from nuclear testing (Thomas, 2008). Even at 2,000 years of human settlement, the Marshalls are one of the earliest occupied places in Micronesia (Thomas, 2008). The key to living well in the limited atoll environment of the Marshalls was sustainability. Archeologists studying *Utrōk* Atoll have found no evidence for over-fishing or other stress on marine resources over the approximately 1,800-year period in which humans have lived there (Harris et al, 2016).

Harris and Weisler (2016) discuss archeological research in the Marshall Islands starting from the late 1970s, when the time period for human habitation of the atolls was established. By the early 2000s, it was evident that the earliest permanent Marshallese settlements were

found on the leeward (sheltered from the wind) islets that were large enough to support taro pits. Archeologists often found smaller, temporary camps on windward islets. The late 1990s through the present have seen an abundance of archeological studies in the RMI, as technologies continue to improve. Development projects have motivated some of these studies by threatening archeological sites, while other studies were motivated by environmental changes which the Marshall Islands have undergone, such as the introduction of new species of plants and animals.

Archaeology in the RMI is difficult for many reasons, so there is little evidence around today about where the first Marshallese people came from and how they got settled. Most of the materials used by the early inhabitants have biodegraded, a process accelerated by the heat and humidity. Violent weather, urbanization, and rising sea levels (Levin, 2017) have erased some ancient history as well. Linguists note that the Marshallese language, which belongs to the Oceanic sub-group (Rainbird, 2004) of the Austronesian language family, has similarities to both the language of eastern Melanesia and that of Southeast Asia (Barker, 2013). (The actual language sub-subgroup to which Marshallese belongs is ironically called “Nuclear Micronesian”.) This supports both of the currently competing theories of early settlement patterns in the Marshall Islands. The first and most popular theory being that the pioneering settlers came from Melanesia, while the newer theory is that they traveled South from Taiwan over 5,000 years ago (Barker, 2013).

The early Marshallese people spoke a language that is now called *kajin etto*, old language (Barker, 2013). Although never written down, this language persists today in the traditional chants (*roro*) known by some elders (Barker, 2013). These chants serve as prayers and navigational instructions. An additional ancient sacred language may have existed in the Marshall Islands as well, but it was replaced by English when the missionaries came with Christianity in the year 1857 (Barker, 2013). Although missionaries had quite an impact on the country, they were not the first strangers to land on its beaches.

Seafaring Skills

Marshallese people are known historically for their ability to navigate the vast expanses of the Pacific Ocean. Both the non-material (chants, knowledge, etc.) and the material (canoes, stick charts) aspects of Marshallese voyaging have been well researched. Some of the unique ways that Marshallese people found their way around the Pacific Ocean were by lying down in their canoes and feeling the wave patterns, and creating abstract maps of the waves, currents, and atolls using “sticks” (plant fibers) and shells or small stones. Today there is a movement to revive traditional canoe building in the RMI, as well as an interest in applying traditional seafaring skills to the waterways of the places where Marshallese people have migrated, such as Beaver Lake and the Buffalo National River in Arkansas State, a large river about an hour’s drive from the Marshallese community in Springdale, AR. Modern technologies have replaced stick charts for the most part, but they remain as cultural artifacts and some people like to use them as decorations.

Colonial History

Around 500 years ago, Europeans, or *ri-paelles* (“people with clothes”), “discovered” the Marshall Islands. Initially they came from Spain. The Spanish came to the Marshalls in search of spices, especially clove (Hezel, 1983). The very first Spanish ship to reach the Marshalls was the *Victoria*, largest and last remaining of a seven-vessel fleet. The commander of the fleet, as well as the second in command, were already deceased by the time the tired ship reached land. Failing to find a spot to anchor, the sailors continued on their journey without setting foot on the island they named San Bartolomé (Hezel, 1983). San Bartolomé is thought to be *Bok-ak* (Taongi), in the far north of the country (Thomas, 2008b). The first Europeans who actually landed on the Marshall Islands, in the year 1529 AD, were also Spaniards. They were sailing a ship called the *Florida*, which had sailed from Mexico (then called “New Spain”) under the command of Hernan Cortes's cousin, Alvaro de Saavedra Ceron. Not long after meeting the

Marshallese in the northeastern islands (likely staying a week on Āne-wātak or Pikinni), Saavedra and his second in command were dead as well (Rainbird, 2004; Hezel, 1983). Charting the unknown world was harsh work and encounters between the desperate Europeans and the Marshallese could easily turn violent (Hezel, 1983). The Spanish never found the spices, gold, or the shortcut that they were looking for in the Pacific. However, they did enjoy stopping in Micronesia for fresh water and other travel necessities and in 1594 they gained control of all Micronesia with the Treaty of Tordesillas (Barker, 2013). However, Spanish political influence in the Marshall Islands was minimal (Winchester, 2015). The beginning of European contact was also the introduction of diseases to which the Marshallese people had no natural immunities. During the centuries that followed, many Marshallese people became sick and died (it is not known which diseases were responsible for their deaths). When a nasty disease is introduced to a new host population, with horrible consequences, it is called a “virgin soil epidemic”. McNeill’s Law states that since biblical times, virgin soil epidemics have helped to pave the way for the conquering of far-off lands (Crosby, 2004). Despite the temptation to apply McNeill’s Law, Thomas (2008b) cautions against viewing the Marshallese as passive victims of the colonization process. The Marshallese people interpreted the visits of the Europeans according to their own culture. For example, in the folktales, or *bwebwenato* that were popularized during the time of colonialism, the Marshallese trickster demigod, *Letao* (AKA *Etao*), acquired European characteristics such as pale skin. *Letao* tries to test people's honesty and he is egotistical (Johnson, 2013). (Today, *Letao* is frequently described as an American.)

Over two centuries after the Spanish, another group of Europeans who were exploring the Pacific came upon the Marshall Islands. They were from England. Captain John Marshall and his colleague, Captain Gilbert of the *Charlotte* (who lent his name to a different group of islands), sailed up the *Ratak* chain and rediscovered many islands, including *Mile* (the Southeasternmost isle of the RMI), and *Mājro* (its current capitol) (Hezel, 1983). In the late 1700s and early 1800s, most of the remaining Marshall Islands were discovered or rediscovered

by the British and added to world maps. Around that time, American ships crossing through the Pacific also started encountering the Marshall Islands, helping to add a few more to the maps. By 1815 most of the Marshall Islands were plotted, some more accurately than others (Hezel, 1983). From 1815 to 1840 France and Russia launched scientific expeditions during which they were able to properly survey the islands of Micronesia, generating maps like those we use today (Hezel, 1983).

Of course to most Americans, the most famous name in Pacific voyaging is Captain James Cook, who made three trips during the 1770s. On his last voyage, Cook did travel through the North Pacific in his search for the mythical “Northwest Passage”. He and his crew sighted many low coral atolls without knowing for certain which ones were inhabited. They caught sea turtles and ate them (Thomas, 2003). However, Cook never made it to the Marshalls.

One of the most prominent Russian explorers of the early 19th century was Otto von Kotzebue. He is credited with initiating the first exchange between Europeans and Marshallese people (Thomas, 2008b). Kotzebue was able to gather detailed anthropological data during the years he spent in the Ratak chain. In addition, Kotzebue’s efforts are also said to have altered the scene of Marshallese warfare by introducing metal hatchets (Thomas, 2008b).

American and British whalers began visiting the Marshall Islands during the 1820s. Those *ri-paelle* who stayed behind in the atolls after their ships left became beachcombers and traders. Soon after them, another type of “trade” – slave traders or “Blackbirders” – arrived in the Marshalls. They abducted Marshallese people for forced labor in Polynesia and South America (Thomas, 2008b).

Meanwhile, the Marshallese were earning a reputation for violence by attacking whaling ships and landing parties. Their reasons for doing so varied from the noble - revenge for Marshallese friends and relatives previously killed by Europeans, protecting their women from kidnappers - to plain old thievery (Hezel, 1983). Along with the increase in European traffic

between the Marshalls, there was an increase in European diseases for the native Islanders, including the flu, measles, and infections of the gastrointestinal and respiratory tracts (Thomas, 2008b).

The infamy of the Marshall Islands made them an attractive site for Christian missionaries, who were up for the challenge. The first missionaries to visit the Marshall Islands belonged to a group called the American Board of Commissioners for Foreign Missions (ABCFM), the first organized missionary group in the US. Euro-American missionaries did not venture to the Marshall Islands themselves. Rather, they sent their Hawaiian converts. This practice helped the missionaries obtain a positive reception in the Marshalls since their Polynesian features were not too strange. Unlike the European whalers, the Hawaiian missionaries were well-received in the Islands, first landing on *Epoon* Atoll on December 5, 1857 (Thomas, 2008b). The first Friday every December is now celebrated by the Marshallese people as “Gospel Day”. In addition to biblical teachings and the English language, the missionaries introduced the “Mother Hubbard” style of dress that kept a woman's body well covered (Winchester, 2015). One of the main chiefs of the *Ralik* chain, *Kaibuke*, is credited with welcoming the missionaries and helping spread the gospel throughout the Islands. “*Nijir tomede eo!*”, the Marshallese people were said to have exclaimed as they towed the missionaries’ ship, the *Morning Star*, ashore. Today, these words symbolize a strong, “energized” friendship (Stone et al., 2000:22).

In the late 1800s, the US had the opportunity to purchase the Marshall Islands from Spain for \$4 million, but the president declined (Nakano, 1983). Germany jumped in instead. In 1885 the Marshall Islands became a German protectorate with *Jālooj* Atoll as the capitol (Thomas, 2008b). Germany’s Jaluit-Gesellschaft AG trading company basically wanted to take control of the Islands (Rainbird, 2004). In 1899 Germany signed a treaty with Spain and gave them 25 million pesetas for the Marshalls. In 1906, Germany began efforts to govern their new colony (Winchester, 2015). Marshallese people were not required to study German, go to

school, or be treated by European physicians (who were actually available on occasion).

Although Germanic governance of the Marshalls was indirect – the traditional chiefs or *iroij* maintained much of their power – it was economically exploitative. The trading company had more power than the colonial government (Rainbird, 2004). At the time, there was a high global demand for copra (dried coconut), an ingredient in many cosmetic products. German entrepreneurs instituted an unsustainable system of coconut plantations. They replaced the traditional mixed-use agroforestry system of breadfruit, taro, and so on with coconut monocultures that they paid Marshallese workers to care for. These workers, unfamiliar with the plantation system, generated many complaints from their German bosses about their work ethic, and the fact that they often ate the young sprouted coconuts (*iu*) they were supposed to plant.

The *iroij* who ruled during the German colonial period not only got to retain much of their power, they actually increased their power and that of their lineage. This was because the Germans saw the Marshallese system as a direct comparison to the European feudal system, in which chiefs had total control of the land as well as the workers who were beneath them. The German government set the chiefly lines of the Marshalls so they would not change, they gave many gifts to the *iroij* and outlawed tribal warfare (Thomas, 2008b). Thus the traditional social system of the Marshall Islands was permanently destroyed.

The Germans also pushed other foreign interests out of the Marshall Islands in order to control the copra industry. But as the saying goes, “Turnabout is fair play.” In 1914 the Japanese arrived in the Marshall Islands and kicked out the Germans (Winchester, 2015). At the conclusion of WWI in 1918, the League of Nations declared the Marshall Islands a Japanese mandate. Japan’s governance of the Marshalls was much more involved than that of Germany because Japan was trying to expand its cultural influence beyond its own narrow geographic boundaries. The Japanese rule went into effect in 1922 and lasted until early 1944. During that time period, over 1,000 Japanese civilians moved to the Marshall Islands. Many were government officials. They tried to influence the social and political structure of the

Marshall Islands with varying results. Some Japanese policies were to switch over control of almost a third of the land from the *iroij* to the government, appoint non-traditional Marshallese leaders, and transfer rights from the matriline to the patriline. They also encouraged the Marshallese people to attend Japanese language schools. At first, the native Marshallese people accepted the changes, at least to some degree, but as WWII approached, relations between the Japanese officials and their Marshallese wards became strained. The government switched from civilian to military rule (Thomas, 2008b). Marshallese people were not allowed to move from the country and many of them experienced food shortages because the Japanese demanded all of their food. The punishment for non-Japanese people caught hunting or gathering the natural resources of the Islands was death.

During WWII, the Japanese fought fiercely for control of their strategically located colony. Thousands died in battle or from starvation (Thomas, 2008b). In January of 1944, the bloody Battle of Kwajaleen took place. Most of the Japanese soldiers in the Marshall Islands were killed by American marines (Winchester, 2015). In addition to the deaths of countless soldiers, there were many civilian deaths as well. Some civilians died in bombing raids perpetrated by both the Japanese and the Americans, which also destroyed much of the vegetation on which people had depended for food and other resources. Other civilians, Japanese and Marshallese, killed themselves because they feared the Americans.

After WWII, the Marshall Islands became an American Trust Territory (Winchester, 2015). The Americans wasted no time turning *Pikinni* Atoll into a nuclear testing site. They exploded the first bomb there in 1946, a year before the trusteeship granted by the U.N. officially began (Thomas, 2008b). The Americans did not do much for the economy of the Marshall Islands during their governance. However, they introduced many aspects of American culture, including the vague ideal of “freedom” (Thomas, 2008b). The irony is that during the American occupation, the Marshall Islands was a highly restricted region. At that time,

Marshallese people were not allowed much “freedom”. The RMI remains strongly Americanized today.

Independence and the COFA: 1979 – Present

The first president of the RMI was Mr. Amata Kabua. Evans scornfully described him as "an overripe pineapple in sunglasses (Evans, 1992:236)." The first Compact of Free Association (COFA) between the US and the nascent RMI was signed in 1983 (Smith-Norris, 2016) and put in place in 1986 (Thomas, 2008b). It was revised again in 2003. According to the COFA, the US has to pay the RMI to rent out space on *Kuwaajleen* Atoll for its military base, the Ronald Reagan Ballistic Missile Defense Test Site, in addition to paying \$150 million in reparations to those Marshallese people who were found by American scientists to have been most affected by atomic testing (this amount has been criticized for being too little, even by Mr. Tony De Brum and the other Marshallese politicians who helped negotiate it). The US was also supposed to provide aid to the RMI in the case of natural disasters and protect them with its powerful military (the RMI is not supposed to have a military of its own). Perhaps most relevant to this research, the COFA allows Marshallese people the freedom to travel freely to and reside within the US without needing visas.

The first COFA was not unanimously supported by the Marshallese population. Fifty-eight percent of Marshallese people who participated in the vote got it passed. Most of the people who voted “yes” on the COFA decision were from *Mājro* Atoll, where Mr. Kabua resided. The majority of the voters from the most radioactive atolls (*Pikinni*, *Rongelap*, *Āne-wātak*, and *Utrōk*) and *Ebeye* (*Kuwaajleen* Atoll) voted against the compact (Smith-Norris, 2016). The current COFA (updated in 2003) promises to provide assistance to the RMI for about 11 more years (Thomas, 2008). The current US lease on *Kuwaajleen* Atoll is set to last until the year 2086 (Horowitz, 2011). The UN Security Council formally ended the American Trusteeship in 1990 (Thomas, 2008b). It still only costs fifty cents to mail a standard letter from Arkansas in

the US to *Arno* Atoll in the RMI because the two countries share a system of currency and a postal system.

Culture

Old National Geographic Magazines dating from the US Trust Territory period described the people of the Marshall Islands as slight of build. Marshallese people today are still shorter on average than Americans. Their faces usually have broad flat noses and high round cheekbones. Their skin color is like rich hot cocoa. The women grow their black hair out long, thick and wavy. It is fashionable to style and wear it with a colorful plastic comb. In Arkansas, women often wear their hair pulled up into a high messy bun. Men wear their hair short and are generally clean-shaven or with minimal facial hair, not full beards.

Marshallese families are typically larger than what Americans consider the "nuclear family" of mother, father, and 2.5 kids. In contrast, a typical Marshallese family will include several generations. A Marshallese family consists of an older woman, her children, and her daughter's children. Anthropologists call this a matrilineage. It may include between 10 to 30 people from three or four generations (Hezel, 2013). This is not to say that the father's family was ever unimportant in conferring a Marshallese individual's identity. Marshallese people traditionally have close ties to both sides of their family. However, the mother's family was always the one that could serve as a "final refuge" if things got really bad for someone (Hezel, 2013).

Families shared land and the resources that the land provided (Barker, 2013). The important polarity of an atoll is that of lagoon-ocean. The lagoon is placid, clear, and relatively shallow with a sandy beach. Most houses are located on this part of the land. In contrast, the ocean is deep and dark with a rocky shoreline (Rudiak-Gould, 2009). The basic unit of land on the Marshall Islands is called a *wāto*. The *wāto* is a strip of land that cuts perpendicularly through the atoll so that one end accesses the lagoon and the other borders the ocean (Barker,

2013). Property rights extend even into waist-deep water (D'Arcy, 2006). A *wāto* may be broken into smaller land areas if desired by the family - or one of the community leaders.

Traditional Marshallese society was stratified. At the top level were the *iroij*, chiefs. There were originally three different subclasses of *iroij*, but those have blended together over time (Spoeh, 1949). Miller (2010) notes that long ago, some *iroij* were considered equivalent to gods. The power of the *iroij* was traditionally tied to the land (Petersen, 1999). *Ekkan* are the tributes made to the *iroij* by the *kajur* (Thomas, 2008). Apart from the *iroij*, everyone else was *kajur*, commoners. *Alap*, land managers, were the appointed heads of each matrilineage (*bwij*), thus they had special status even as *kajur*. In the past, there was an additional class of *kajur* with special status. *Atok* were held in high regard as warriors, shamans, and navigators. But as with the stratification of the *iroij*, this distinction has since become obsolete (Spoeh, 1949). At the bottom sociopolitical level were the *ri-jerbal*, workers, the everyday *kajur* who fished, sailed, and made war.

Today the government of the RMI is organized democratically, with representatives from each of the major atolls and islands comprising the *Nitijela*, parliament. These senators vote amongst themselves to elect a president, who then chooses his or her cabinet from the remaining politicians (Barker, 2013). Although the *iroij* do not yield the political power they once did, they are still generally honored and respected (more so than the former chiefly classes elsewhere in Micronesia), and many have seats in the *Nitijela* (Hezel, 2013). The current president of the RMI is also the first woman to hold the position. Her name is Ms. Hilda Heine.

Rudiak-Gould (2009:14-15) described the sexual division of labor on *Wūjae* Atoll in 2003. He listed some male activities as "spearfishing, netfishing, linefishing, coconut fetching, coconut husking, coconut scraping" and "hunting crabs on a far-off islet", and those of the women as keeping "the grounds immaculate, the fire burning, and the children working" as well as "preserving breadfruit in a salty tide pool or weaving pandanus-leaf mats." Traditionally, the sexual division of daily tasks created intergenerational bonding time between same-sex

relatives. When women and girls sat in circles weaving pandanus mats, and men and boys went out fishing in canoes, that was the time when cultural knowledge was passed down, as well as time for bonding (Johnson, 2013). *Bwebwenato*, chatting and storytelling sessions, are thought to encourage social cohesion, like a built-in support group (C. Chonggum, personal communication). Some people believe the increasing isolation and purposelessness felt by modern Marshallese people, especially young men, is partly to blame for the country's high suicide rate. Even this has to do with food, because imported goods have replaced fishing and the use of other natural resources in recent decades.

In the RMI today, social and economic activities continue to be gendered. However, introduced technology and Western values have created somewhat of an imbalance favoring males - at least as far as relaxation is concerned. Technology has made fishing at least less time consuming than it was in the past, but child-rearing is still a full-time job. While the extra time to sit and drink coffee with the guys may be an enjoyment for some, other Marshallese men, especially young men, are having trouble coming to terms with feelings of boredom and depression. The suicide rate is high among young Marshallese men, particularly those in the Urban Centers.

Traditionally, Marshallese lessons, including history, were passed down orally. Television did not come to the Islands until relatively recently, and may still be limited in the "Outer Islands" (everywhere except the "Urban Centers" of *Mājro* and *Ebeye*). Therefore, hanging out with others of the same gender and talking, telling stories and jokes, was an important form of education, entertainment, and cultural transmission. Like much of the traditional culture however, this kind of talking has fallen out of fashion among the younger, more urbanized and technologically savvy set.

Matching the aspect of island dwellers around the world, Marshallese people tend to be very friendly and agreeable, at least on the surface (like "Southern" Americans in Arkansas). Marshallese society is close-knit (Johnson, 2013). Many scholars have noted that the

Marshallese word for "alone" is the same as the Marshallese word for "lonely". For as long as people have been living in the Marshall Islands, they have traveled between and beyond the Islands and atolls sharing and trading and waring (as demonstrated by archeological and genetic evidence (Thomas, 2008)).

The Marshallese people traditionally have a collectivist society where, as a general rule, the needs of the group are prioritized over the needs of the individual. Surviving in the Islands was a collaborative effort after all. The population size necessary to ensure genetic diversity and sufficient resource production would have been considerable. However, the population size was still limited by the uniquely challenging atoll environment. Archeologists studying Utrök Atoll, the northernmost permanently inhabited Marshallese atoll, note that although humans have lived there for almost 2,000 years, the population size has always been relatively small (Harris et al, 2016). Population control measures included adoption, abstinence, relocation, and contraception, in addition to methods no longer considered politically correct such as ritual murder and abortion (Thomas, 2008). Since population control has fallen out of fashion, and there is a very high birth rate (and teen pregnancy rate) in the RMI, there are currently more Marshallese people alive than ever before in history (Thomas, 2008b).

Like many societies considered primitive by Westerners, the traditional Marshallese people maintained a balance of power between men and women. Both men and women could be privy to special knowledge as healers or navigators (*ri-medo*) (D'Arcy, 2006). Land, invaluable as a place of food production, was owned by women and passed down matrilineally through generations. "Kinship in Micronesian societies is comprised of intertwining ties among persons, land estates, food, and the interchanges among these (Marshall, 1999:123)." The matrilineage is called the *bwij* in Marshallese. Lineages believed to be descended from a common ancestor were grouped into clans, with fifteen or so different clans per atoll (D'Arcy, 2006). Even these days, before two people marry, they are supposed to check that they come from different ancestral backgrounds. However, the question seems to be not whether any two

people are related, but how distantly, as lineages and clans were interconnected and very spread out across the islands. One of the main reasons that Marshallese people travelled so frequently was to keep in touch with family and friends throughout the two archipelagos. The early European visitors who encountered abandoned dwellings had trouble understanding the easy transience of the Marshallese (D'Arcy, 2006).

In the RMI, age comes before beauty. Youths under the age of about thirty or forty are not considered responsible adults (Johnson, 2013) – a sentiment echoed in the Springdale community. Youths are often given chores such as sweeping and serving food (Johnson, 2013). In contrast, elders are venerated. Perhaps because of the high esteem placed on age, Tobin (2002) noted that Marshallese people often overestimate people's ages. In the late 20th century, Evans gave the average age of the Marshallese population as only 14 years old (Evans, 1992).

Today there is a sizeable Chinese population in the RMI. Rudiak-Gould reported encountering explicit anti-Chinese sentiment among Marshallese people on *Wūjae*. The Marshallese were upset that Chinese people were taking over businesses in the country (Rudiak-Gould, 2009). Chinese people have been able to buy up some land, although it is generally quite difficult, and borderline illegal, for non-Marshallese to own land in the RMI, as seen on the popular American TV show, "House Hunters International" (Season 70: Episodes number 4 and 12). Although Marshallese people may resent Chinese people owning land in their country, they seem to have a favorable opinion of the Taiwanese because of Taiwan's political support of the RMI.

In the RMI, the people follow a laid-back rhythm they jokingly refer to as "Island Time", *Awa in Majel* (Rudiak-Gould, 2009). Marshallese people don't necessarily plan ahead – there are too many variables and unpredictable occurrences (Johnson, 2013). Although in Springdale, many Marshallese people have adjusted to the 9-5 rhythm of the work week, Marshallese events in the US may still start and end much later than planned.

Marshallese people have presented considerable and consistent social reserve, marked by self-effacing expressions in the everyday interactions and conversations observed. Their reticence and social reluctance diminished however with more frequent visitations and interactions, yet remains a perceptible part of their presentation of group identity, at least through the lens through which this work was conducted. Even as densely-acquainted kin groups and social networks became familiar to me, the researcher here, much more interesting and revealing components of Marshallese identity became slowly and increasingly revealing, and apparent. One mechanism that is commonly used as a guard against emotionality is silence. Another is joking, especially self-deprecating humor. In general, Micronesian women are more likely to reveal their true feelings than men (Hezel, 2013).

Some of most important Marshallese values are practicing Christianity, sharing, getting along with others, respecting elders, and maintaining one's composure (Rudiak-Gould, 2009). Survival in the atoll environment traditionally depended on people being free with food and materials. At any rate, since there wasn't much in the environment that couldn't be gathered up just as easily by anyone else on the atoll, no one would be petty enough to hoard things like coconuts. On the other hand, information and knowledge were considered prestigious things that needed to be guarded (Hezel, 2013) and knowledge transmission was regulated by the *iroij* (Miller, 2010). Important information such as the skill required to produce a stick chart (D'Arcy, 2006), was held only by a few select families, or *bwij* (Miller, 2010). Aside from knowledge, the early Marshallese people are said to have valued their tattoos (which went out of fashion with the conversion to Christianity) because the images on their skin were the only things they could take with them to their grave.

The deeply ingrained custom of food sharing has made the Western plan of economic development unproductive in the RMI and other Micronesian countries because people are able to depend on family members and friends rather than being forced to support themselves (Johnson, 2015). Likewise, Western abuse of the Islands has made food sharing potentially

dangerous because the custom might spread contaminated materials from the old testing grounds to other places. The occurrence of thyroid cancer throughout the RMI is thought to be linked to the distribution of irradiated goods (Nakano, 1983).

Language

Just as there was an archaic, Shakespearean English that is seldom used today in English-speaking countries, there was an ancient Marshallese language that is both similar to and different from the Marshallese language spoken today. Vestiges of the former persist in some traditional chants and stories (Tobin, 2002).

Although different dialects of modern Marshallese are spoken in the Ratak and Ralik archipelagos, they are mutually understandable. Throughout the country and in Springdale, the language varies greatly in terms of spelling, pronunciation, and names for things. However, Marshallese people do not seem to have any difficulty communicating with each other. As far as the sheer number of words, Marshallese is more limited than English. This makes Marshallese speech patterns seem to wax poetic in translation. For example, the Marshallese greeting "*lɔkwe*" has been translated to "You are a rainbow." To ask forgiveness in Marshallese is literally to ask someone to "throw away the mistake". And a proper response is "It's thrown away." The German ethnographer August Erdland wrote about the Marshallese peoples' love for metaphors in 1914 (Stone et al., 2000). Today, Marshallese poets inspire people from all nations by writing about topics such as the environment.

To Marshallese people, the words "Yes" and "No" symbolize different concepts than they do in the US (Hezel, 2013). It's more about telling someone what you think they want to hear. They "speak more to affirm people than to package information (Hezel, 2013:82)." Which means they almost always agree. The word "No" is considered somewhat offensive (Johnson, 2013). In keeping with their agreeable tendencies, there is no Marshallese word for "enemy" (Johnson, 2013).

The first written Marshallese was transcribed by missionaries who wanted to translate the bible. However, the missionaries had no mastery of the subtleties of Marshallese speech. Therefore, today a newer (1976) transcription system is used based on the most prominent Marshallese-English dictionary by Abo et al. This system contains characters that are not available on standard American keyboards, so on media such as Facebook, spelling is approximated. In this work, I will follow the transcription system of Abo et al. (the dictionary). For words not in that dictionary, I will use the transcriptions given to me by Marshallese speakers in Springdale.

Marshallese people are said to be intuitive and good listeners as well. They are often reserved, but not without a healthy sense of humor. They have a culturally ingrained behavior of offering a speaker a longer pause in the conversation to finish his or her thought than Americans usually have. In the RMI the pause may be 4-5 beats - painfully long for many Westerners (Hezel, 2013).

Folk Taxonomy

In my research, I came across only Berlin's (1973) "lifeform" (e.g. fish, *ek*), "generic" (e.g. breadfruit, *mā*), and "specific" (e.g. type of breadfruit, *mejwaan*) categories. All of the Marshallese words that I encountered at these different levels were mono-nomial. None of my collaborators mentioned any poly-nomial words, which are sometimes encountered at the "specific" level in English. There is certainly a need for more research on this subject. The only reference I found was a footnote about sea mammals in one of the folktales, *bwebwenato*, collected by Tobin (2002).

Religion

The Protestant missionaries who converted the people of the Marshall Islands had almost a 100% success rate. Many gods converged into one, Christian god. The missionaries ended warring and tattooing. Today most Marshallese are Catholic or Protestant. Additionally,

by 2009 there were enough Mormons in *Mājro* to start their own church. *Mājro* also has a mosque, erected in 2012 to serve the country's "small but growing" Muslim community (Johnson, 2015:31). There are also a small but not insignificant number of Marshallese who practice the Baha'i faith. However, despite the popularity of Christianity and other imported religions, the traditional Marshallese religion has not completely died out (Pollock, 1992). There are still some elders who remember the traditional religious chants. In a 1994 interview with American Anthropologist Holly Barker, a Marshallese man mentioned black magic as a potential cause of birth defects (Barker, 2013:55). That man, undoubtedly a Christian, still believed in traditional curses. For a brief period during the Japanese occupation, Christian practices were banned. They were revived again during the American administration.

The strict observance of the Day of Rest seems to throw off many Western visitors to the Outer Islands, when the usual activities required for subsisting in a resource-limited environment are put on pause to celebrate the weekly Sunday sabbath.

Some Americans are also surprised by the faith of the Marshallese people in the face of impossible challenges such as global climate change. Whereas people in US refuse to believe that anthropogenic climate change is real, or they believe and look to alternative sciences to solve the problem, many people in the RMI look to God to save them from the rising tides, as He rescued Noah. This attitude parallels that of the devout Muslims in earthquake-prone Morocco who were interviewed by Paradise in 2006. That group of people preferred to depend on Allah to help them avoid danger instead of depending on other things such as earthquake-predicting technology.

Social Life

Family and community are very important to Marshallese people, in the RMI and beyond. The strongest bonds of the Marshallese family are between siblings, with parents and significant others taking second place (Marshall, 1999). Because sibling relations are so

important, the Marshallese traditionally have fierce taboos against incest, which may include marriage within the same clan. However, Marshall (1999) notes that these taboos have been relaxed on atolls where the population size is not large.

“Nightcrawling” is a Marshallese term most synonymous with the American concept of “seeing each other” or “hooking up”. It proceeds when a man calls for a woman to join him in the jungle at night. Nightcrawling is a private event. As soon as their relationship becomes public, a couple is considered betrothed (Hezel, 2013). Weddings were not traditionally considered special events in the Marshall Islands. As in other societies where it is common for young couples to live with their parents, marriage was celebrated less than the birth of children (Harbottle, 2000). It is common even today for a Marshallese couple to have sex (as evidenced by the high rate of STDs among very young Marshallese people), and even to have several children before marriage. They typically marry at a later age than Americans in Arkansas (A. Latior, Personal Communication, 2015).

Cross-cousin marriages (between the children of a brother and sister) were traditionally encouraged in the Marshall Islands as a way to maintain strong matrilineages, although the number of these arrangements differed between atolls (Marshall, 1999). Once a couple is married, they could set up house on the property of the husband or the wife, or neither (Marshall, 1999).

The traditional first birthday party, *keemem*, is a huge special event. Family, friends, and neighbors enjoy a big party with a feast, music, dancing, and gifts. The *keemem* has its roots in the not-so-distant past when babies born in the Marshall Islands had about a fifty percent chance of surviving their first year (Rudiak-Gould, 2009). Today their odds are much better, but the celebration is still a very important occasion in the life of a person and his or her family. Rudiak-Gould (2009:197) celebrated at a *keemem* on *Wūjae* in 2004. There was loud music and “the island’s best” food. However the atmosphere there was solemn. In Springdale *keemems* are less solemn.

Funerals are also big celebrations. There is a Marshallese half-joke that the two biggest events to mark a person's life, *keemem* and funeral, are the ones they will never remember. Unlike American funerals they are filled with loud music. Marshallese funerals, which traditionally have three parts, are a bonding time for the family (Hezel, 2013). Emotionality at funerals is socially accepted. Rudiak-Gould (2009) observed collective open sadness at a funeral he attended on Wūjae in 2004.

Holidays and the arrival or departure of visitors to an atoll are times for community celebrations as well. Two of the biggest holidays in the RMI are Christmas and Gospel Day. Gospel Day celebrates the arrival of the missionaries in the Islands. In Springdale, Thanksgiving and May Day (*Jemenei*, or Constitution Day, celebrated over Memorial Day Weekend) are also important holidays.

Adoption

Adoption is a strong Marshallese custom leftover from more sustainable times when it served as a means of solidifying kinship bonds and controlling the population (Thomas, 2008). Marshall (1999) notes that the practice of adopting the child of a sibling was especially common. Hezel (2013) reported that over half of his students during the time when he taught in Micronesia, about a generation or two ago, claimed they were adopted. The number is likely still that high among Marshallese and other Micronesian families in the RMI, Springdale, and elsewhere (Marshall, 1999). Thus, the Marshallese concept of families is more fluid than that of most American families. Marshallese people typically consider their cousins as close as sisters and brothers, and their aunts and uncles to be like their own biological mothers and fathers. Parents in the RMI may send their biological children to stay with relatives in Springdale so the kids can get an American education. Also, young Marshallese parents with fewer resources may rely on older relatives to help them raise their biological children while they continue to work. However, Marshallese adoptions are not like most typical American adoption

arrangements. They are most similar to, but not exactly like, American open adoptions. Thus, there may be friction when Marshallese children are adopted by well-meaning non-Marshallese Americans.

Insulation

As jovial as Marshallese people are, and as much as they value family relationships, many non-Marshallese visitors to the Islands have struggled for acceptance. Perhaps this is the result of language and cultural barriers, or conversely, the Marshallese people may have understandably withdrawn from outsiders, whose history of exploitation can hardly be ignored. Either way, Nakano, (1983) noted a lack of “circulation” between the American, British, and Taiwanese ex-patriots she met on *Mājro* and the native Marshallese people.

Economy

The export of copra, dried coconut meat, from the Marshall Islands began in 1860 (Pollock, 1992). "Copra was the cash crop of the Marshall Islands, producing the country's only significant export product: coconut oil (Johnson, 2013:99)." Copra remains one of the few economic incentives for people to stay on the Outer Islands (Johnson, 2013). There has been a massive rural to urban population shift in recent decades and today more than half the population of the RMI lives in the Urban Centers (UCs), *Mājro* and *Ebeye* (Bryant-Tokalau, 1995).

The RMI government is the country's largest employer (Schwartz, 2015). The Marshallese-owned Robert Reimers company is the second largest employer (Nakano, 1983). Two-thirds of the RMI's money comes from the US (Rudiak-Gould, 2009) in the form of reparations (for the four acknowledged radioactive Island populations), rent (for *Kuwajleen*), or aid. Although per capita income in the RMI is relatively high for a developing country, it is not reflected in the living conditions of the Marshallese people, especially in the crowded UCs (Johnson, 2013; Bryant-Tokalau, 1995).

Shipping has been called the RMI's "rogue industry". The government of the RMI legitimizes US shipping by issuing special permits. This is a convenient bit of leverage they can use to fight against nuclear proliferation and climate change (Mathiesen, 2017).

Since they don't have the resources to "go green" in the same way as rich Western countries, some people believe that sustainable development for less industrialized countries such as the RMI should come from traditional rural businesses (Le, 2016). In the RMI such businesses may include copra and breadfruit flour production.

Land

"Take away their land and their spirits go also," is a much-quoted statement about the Marshallese people, first made by anthropologist Robert Kiste in a petition on behalf of the Bikinians (Marshallese people from *Pikinni* Atoll) displaced by US nuclear testing. It illustrates the importance of land in the Marshall Islands. Ancestral land is called *lamorin* in Marshallese (Smith-Norris, 2016).

Thaman (2008) identified eight different ecosystems (also called "life zones" or "resource areas") on *Mājro* Atoll. The three natural ecosystems were "inland atoll forest", "shoreline or littoral vegetation", and "mangroves and coastal wetlands". The remaining five man-made ecosystems were "Coconut-Dominated Agroforests and Scrubland", "Excavated Taro Pits", "Houseyard and Urban Gardens", "Intensive Vegetable Gardens", and "Ruderal Vegetation" (Thaman, 2008:26). The reason that these different ecosystems are known alternatively as resource areas is because they all contain slightly different plant and animal resources that islanders have figured out how to exploit, kind of like having different grocers spread out across the atoll, one store might "sell" fish, another one has birds and land crabs, another has coconuts, and so on.

Only 20 of the 29 atolls and 4 out of the 5 islands of the RMI are inhabited (Terry and Thaman, 2008), including the world's smallest inhabited atoll, *Namdik* Atoll, with about 900

people on about one square mile of land (Miller, 2010). Most of the thousand plus islets that make up the RMI are too small to be inhabited (Rudiak-Gould, 2009). Yet all land is highly valued, as a source of food, a connection to one's ancestors, and a symbol of belonging to a family. A family owns land through the grandmother. So, all land is communal since more than one person may claim it (Pollock, 1992). However, no land is public because all of it is claimed by someone (Rudiak-Gould, 2009). Land parcels were traditionally inherited from mothers (but may also be earned or purchased). Therefore, in the past, women had considerable control over land (Hezel, 2013). Land was shared by the family so that everyone could work it to help produce food. These days men may claim property (Hezel, 2013). This may lead to nasty, prolonged land disputes (Hezel, 2013). Place names in the Marshall Islands are often quite descriptive, revealing information not just about the physical features of the place but also about its owners and its history (Barker, 2013). All of the land in the RMI is claimed by the clans (*jowi*), even the smallest islets (Takeuchi and Koning, 2010). And every place has a name. The Marshallese-English dictionary, Abo et al. (1976) has an appendix of place names in the back. Land was so valuable that in the past only the *iroij*, members of the highest class, had the honor of being buried in the ground when they died. Wenkam and Baker (1971) also make much of the fact that the Marshallese words for describing land are like those for describing a strong or weak man. Land is spoken of in terms of "blood", "bone", and "sinew".

About half the population of the RMI, or about 30,000 people, live on *Mājro* (Hezel, 2013), an atoll of more than fifty islets with a total land area of about 9 km² (approximately the same size as some of Northwest Arkansas' smallest towns like Elm Springs or Johnson). It serves as the administrative center of the country. In the late nineteenth century, the popular author Robert Louis Stevenson referred to *Mājro* as "the pearl of the Pacific." However, his 20th century counterpart, Julian Evans, wrote "Majuro [sic] was the most unspeakable dump I had ever seen (Evans, 1992:228)." It is certainly the most urbanized part of the RMI.

In the 1970s *Ebeye* had been nicknamed "The Slum of the Pacific" (Johnson, 2013). Unfortunately, in the current decade the atoll faces many of the same overpopulation issues, including issues with the operation of the sewage plant (Johnson, 2013). *Mājro* and *Ebeye* are the densely populated Urban Centers, in contrast to the rest of the country. Everywhere outside of *Mājro* and *Ebeye* is called the "Outer Islands". When the late Marshallese health advocate Darlene Keju-Johnson first moved from the Outer Island, *Wotje* Atoll, to bustling *Ebeye* on *Kuwajleen* Atoll she observed that the people there bought imported food such as white rice from the stores instead of producing their own foods such as breadfruit and taro (Johnson, 2013). Johnson (2015) predicts that the Urban Centers would implode if their supply of imported foods and drinks ever gets cut off.

On the Outer Islands, people must eat food as it is available because large refrigerators are not common. Giff Johnson describes sitting down to a hearty meal of sashimi at 3am, because that was when the fishermen caught their catch (Johnson, 2013). Because they eat fresh, locally grown food, people on the Outer Islands are healthier than those living in the Urban Centers. As healthy and delicious as the Outer Islands food may be however, Westerners repeatedly describe the menu as monotonous. They typically mention craving fresh fruits and vegetables, or just something different than the regular diet (Johnson, 2013). One interesting fact about mealtime monotony is that people tend to eat less of the same foods (Herz, 2018).

The rural Outer Islands are considered by many to be the "real" Marshall Islands (Johnson, 2013:253). Life on the Outer Islands does not follow a clock, only the sun. People there have to physically work for their food. But even though they work hard, they don't have to pay taxes. During the 1960s, most Marshallese people lived in the Outer Islands. But today, almost 75 % of them live in Urban Centers. In the first decade of the 21st century, 4,000 Outer Islanders moved to Urban Centers or other countries such as the US (Johnson, 2015).

Factors pulling people to urban centers include vehicles, air conditioning, healthcare, electricity, plumbing, restaurants, nightclubs, stores, cable TV, and "an abundance of consumer goods" (Johnson, 2013:293)." Ships bring local foods from the Outer Islands – *bwiro* (fermented breadfruit), crabs, and pandanus - to the urban centers of *Mājro* and *Ebeye* (Rudiak-Gould, 2009). The types of jobs available in *Mājro* are mostly with the government of the RMI, and in *Ebeye* the jobs are mostly in service work at the US military base. In addition to the thoroughly urbanized atolls of *Mājro* and *Ebeye*, there are two Outer Islands that are relatively more urban than the rest. They are *Jālooj* and *Wotje* (Rudiak-Gould, 2009). *Jālooj*, the former capitol of the Marshall Islands, has a high school in the village of *Jabor*.

In recent years, the traditional socio-political structure and the way that land is traditionally owned have been subject to corruption. In the past, everyone had relatively equal access to everything available, the *iroij* helped make sure of that. Today however, there are different kinds of goods and services, and money to purchase them. Now if a landowner wants any of these more recent luxuries, he or she doesn't have an incentive to redistribute his or her wealth. As in most modern countries, there is greed and corruption.

In the past, places where the natural resources (i.e. foods, medicinal plants) were being depleted too fast could be branded off-limits or taboo (*mo*) by the *iroij*. These days even if the traditional leaders still held that degree of power, the population pressures are too high to take land and reefs out of production (Rudiak-Gould, 2009).

Horticulture/Agriculture

The Marshallese people were traditionally horticulturalists, people who focus their subsistence on a limited number of plants (as opposed to agriculturists, who grow numerous plants). From the small variety of plants that grew in the Marshalls, the people who lived there were able to make wide array of different products, including various delicious dishes, effective medicines, necessary material goods such as tools, and extra material goods such as

decorative mats and toys. Thaman (2008) notes that most plants of the Marshall Islands have at least 7 different uses. Many plants, such as coconut, pandanus, and hibiscus (*Hibiscus tiliaceus*), or *lo*, have far more.

Traditional Ecological Knowledge (TEK) is a term favored by ethnobotanists to describe the wisdom about the natural world that gets passed on from generation to generation within a culture. Marshallese people have a great deal of invaluable TEK. "They practiced horticulture based on principles acquired through trial and error over generations. They had a supply of reliable fishing techniques and a knowledge of good fishing grounds that was accumulated over the years. . . (Hezel, 2013:153)."

The main subsistence crops were coconut, pandanus, and breadfruit. However, on some of the more southernly atolls, bananas (*Musa spp.*) and plantains (*Musa x paradisiaca*) were also grown. The most important staple crop that was not a tree was giant swamp taro (*Cyrtosperma chamiossis*) (Thaman, 2008). Thomas (2008) notes that the agroforestry traditionally practiced by the Marshallese was relatively sustainable.

Taro was traditionally grown in special pits called *bōl*. The pits were dug down to the freshwater lens and fertilized with leaf litter for many years until the soil in them turned into a fertile organic muck (Terry and Thaman, 2008). Taro cultivation was traditionally men's work in the Marshall Islands (although elsewhere in Micronesia it was considered the domain of women) (Hezel, 2013). When Nakano (1983:123) asked Michael Capelle, deputy director of Resources and Development in the RMI in the early 1980s, what kinds of crops were growing well under concentrated farming efforts (led by researchers and volunteers from Taiwan and Canada), he listed only the expected coconut, breadfruit, taro, and pandanus. When pressed further about possible options for private farms, Capelle said, "Papaya, tapioca, green pepper, water melons, that kind of thing." Vegetables such as onions and melons like to have a lot of water relative to cereal crops, which is why the subsistence bases of most Pacific countries are made of fruits and vegetables instead of grains.

Japan introduced sugar cane (*Saccharum officinarum*) to the Marshall Islands for economic development after taking control in 1914, bringing in Japanese citizens to work the fields (Hezel, 2013). Like bananas and taro, sugar cane thrives in very wet soil. Sugar cultivation however, did not end up becoming significant in the Marshall Islands.

Neither Western-style gardening, nor the Eastern-style gardening of Chinese and Taiwanese people living in the Marshall Islands, have been widely adopted either. Such deliberate gardens are mostly found at commercial and governmental sites, or at private residences or tourist resorts (Terry and Thaman, 2008). The prevailing myth is that the “hunter-gatherer” Marshallese people don’t understand agriculture. However, that cannot be true since they have been intentionally planting trees for a very long time. Some of the plants that Thaman (2008) recorded growing in intensive gardens on Mājro were pumpkins (*Cucurbita pepo*), gourds (*Luffa spp.*), and my least-favorite food, bitter melon/*Momordica charantia*), various Chinese cabbages (*Brassica chinensis*), tomatoes and eggplants (*Solanum spp.*), bell peppers (*Capsicum annuum*), and beans (*Lablab purpureus* and *Vigna unguiculata*). Nakano (1983) noted that Taiwanese agricultural development workers also tried to introduce sweet potatoes (*Ipomoea batatas*), corn (*Zea mays*), watermelons (*Citrullis lanatus*) and white radishes (*Raphanus sativus*), as well as Taiwanese varieties of taro (because they are sweeter than the Marshallese varieties).

Rudiak-Gould (2009:106) recounts the history of failed Western-style gardening initiatives in the Marshall Islands, starting with the good intentions on *Wotje* Atoll of Kotzbue’s naturalist, Adelbert von Chamisso. On *Wūjae* in the early 2000s, Rudiak-Gould himself was able to do no better. Nor was the volunteer agricultural worker from *Mājro* that he encountered. Their plots of garlic, beans, corn, squash, and banana withered in the poor soil due to lack of concentrated care. The soil on coral atolls tends to be alkaline (Levin, 2017). Garden soil amendments in the Marshalls may include ground coconut husks, animal (even human)

manure, and imported chemical fertilizers (Terry and Thaman, 2008). “Fertilizer is cheap,” a Taiwanese farmer on *Mājro* told Nakano (1983:126), “transportation is expensive.”

Unlike the grassy yards surrounding American houses, Marshallese yards are usually graveled in small pieces of coral called *la*. These coral pebbles keep the area free of mud and vegetation (Rudiak-Gould, 2009). In addition, they can quickly be converted to toys for juggling when in need of idle entertainment.

Women in the RMI are very busy so they may not have time to look after plants from temperate zones that are ill-suited to the harsh reality of the Marshallese climate. Men may have the time, but not the cultural programming. They are traditionally fishermen, not farmers. In the Urban Centers, it is so crowded that few people have space to garden (Johnson, 2013). While lack of land, especially of arable land, is definitely a limiting factor for gardening in the RMI, Nakano (1983) repeatedly found that getting Marshallese people to accept novel fresh fruits and veggies was also challenging for would-be producers. “People don’t eat them yet (p.123).” She was told. And “You’ll never get these people to eat salads (p.124).” And yet, canned vegetables are imported to Island groceries.

Military and Nuclear Legacies

According to Wenkam and Baker (1971), World War II was the worst thing to happen to the whole Micronesian region. It thoroughly disrupted the traditional way of life in the Marshall Islands, in addition to destroying the natural habitats that people depended on for sustainable living.

Won by fighting off the Japanese occupiers during World War II, the Marshall Islands were used as a United States nuclear testing site for twelve years. During this period, sixty-seven super-bombs were detonated on Āne-wātak and Bikinni Atolls (Barker, 2013). Included in those tests was Castle Bravo, the second biggest nuclear explosion ever on Earth (after the Russian Tsar Bomba). Because of this nuclear legacy, and also because the Islands continue

to have military value as an active missile testing site and military base, the US still maintains a unique relationship with the RMI, in which millions of dollars are exchanged. The money supports the Marshallese economy, but the missiles continue a practice of environmental and social destruction.

The United States' Ronald Reagan Ballistic Missile Defense Test Site is located on *Kuwajleen* Islet, at the southern end of *Kuwajleen* Atoll. Although the well-guarded base has been described as "cruelly isolated", and "cheerless and institutional" (Winchester, 2015:13) by Americans accustomed to continental life, it is also one of the few places in the RMI rich in First World comforts such as tennis courts, swimming pools, and a movie theater. Military personnel, along with a few thousand civilian contractors (mostly from Alabama) stationed on "Kwaj" have enjoyed its "country-club-like atmosphere" (Evans, 1992:239) for decades. As disenchanted as Julian Evans was with the food in the rest of the RMI, he was able to enjoy a breakfast buffet (including fresh papaya) on Kwaj (Evans, 1992). Many former residents of the islet fondly reminisce about the ideal 1950s-style small town community it resembled (Hirshberg, 2012).

There are Marshallese people on Kwaj during the day – but they don't live there. They clean, cook, babysit, and so on. Then after their shifts (and before their curfews), they are ferried back to their homes on *Ebeye* - a "dormitory island" (Evans, 1992) with a reputation as a ghetto. The population of Kwaj is relatively diverse (there are some Asian-Americans who live and work there). However, since 1951 no Marshallese people have been allowed to live on Kwaj. Marshallese people are restricted from even shopping at the stores there, and security checkpoints ensure that they cannot smuggle products off the base (Hirshberg, 2012). *Ebeye* is over-populated with Marshallese people who have jobs on Kwaj, and their extended families. The infrastructure of *Ebeye* is in need of repair, including the hospital, school, and sewage system. There are no laundromats on *Ebeye*. There is one food store that sells SPAM and soda to a population prone to type II diabetes (Winchester, 2015). During the 1970s and 1980s, there were several protests against the alleged "American apartheid" of Kwaj and *Ebeye*. The

success of these protests was that the US government paid a bit more to the Marshallese government for the rent of the base (Hirshberg, 2012). Unfortunately, most of the Marshallese people who historically own the land rights on *Kuwajleen* Atoll don't get to see any of the money paid by the US for the use of their islets. As in many countries around the world, there seem to be some corrupt practices occurring at the top that dam the trickle-down to the bottom.

As heart-wrenching as conditions are on *Ebeye*, they pale in comparison to the catastrophe of nuclear testing in the northern Marshall Islands. Much has been written about the military and nuclear legacies of the Marshall Islands. Indeed, it seems to be a much "sexier" subject than foodways (who would want to wear a bathing suit called the "breadfruit"?).

Pikinni Atoll was efficiently depopulated prior to nuclear testing. All 167 men, women, and children living on the atoll were asked to sacrifice their home. Commodore Ben H. Wyatt from the United States Navy convinced "King Juda" (Juda Kessibuki) the *iroij* of *Pikinni*, that the Atoll was needed for a special project. On a Sunday in 1946 Wyatt spoke his now famous words "for the good of mankind and to end all world wars". He was playing off the Bikinians Christian faith and their relatively powerless position. In less than a month, all the Bikinians were moved off their atoll. The explosion of Crossroads Baker contaminated *Pikinni* as the people were shuffled from island to island, finally landing on *Kili* Island. The explosion of Castle Bravo on March 1, 1954 at 6:45 am, did more than just contaminate *Pikinni* - it obliterated several islets. Castle Bravo was the world's second H-bomb - and the second one tested in the Marshall Islands. The first, the comparatively smaller Ivy Mike was exploded on *Āne-wātak* Atoll. The Castle Bravo bomb was code named the "Shrimp", though it was the size of a large propane tank (Winchester, 2015).

A 57,000 square mile area of ocean was labeled a "Danger Area" and sailors were given official notice to keep their distance (Winchester, 2015). The official story behind the radiation poisoning of the Marshallese people who lived on nearby atolls was that there was a sudden, unanticipated wind shift during the Castle Bravo test that carried the fallout to those atolls,

notably *Rongelap* and *Utrōk*. However, US military documents declassified during Bill Clinton's presidency declared that there was no such atmospheric event. Rather, a premeditated plan was enacted, dubbed "Project 4.1", to expose the human beings on *Rongelap* and *Utrōk* to atomic radiation. At any rate, the radius of a 57,000 square mile area is only about 135 miles. That's much smaller than the 500 mile radius of the danger zone around America's other nuclear test site in Nevada. A 500 mile radius around Castle Bravo would include all but the southernmost Marshall Islands (Johnson, 2013). The people in charge decided to run the Castle Bravo test for several reasons. One reason was that they just didn't know how much, if any, radiation would be released because Castle Bravo was the first bomb of its kind (Ivy Mike had a different hydrogen source). Another reason was that the man in charge of the test, Alvin Graves, had a well-earned cavalier attitude toward radiation poisoning. He had been involved in a nuclear accident and recovered completely - except for a small spot on his head that remained bald. Another reason that the test was conducted despite warnings from scientists about possible contamination of inhabited areas, had to do with the casual racism of the era. At the time the nuclear tests were conducted in the Marshall Islands, the Civil Rights Movement in America was just beginning to intensify.

Approximately eight days after the Castle Bravo explosion, the US launched Project 4.1 (Winchester, 2015). This was a "study of response of human beings exposed to significant beta and gamma radiation due to fallout from high yield weapons" (Johnson, 2013:371). When the Project 4.1 part of the Castle Bravo operation was originally conceived, it was significantly different, calling for an evaluation of radiation effects on mice (Horowitz, 2011). Many Marshallese people suffered directly from radiation poisoning and many continue to feel the effects of the nuclear tests today (for example in the 1.6% increase in the incidence of thyroid cancer in the RMI since the testing (Simon et al., 2010)). The US government has not yet issued any formal apology, but they have paid some reparations – Section 177 of the COFA earmarked \$150 million for people from four of the most severely affected atolls (*Pikinni*, *Āne-*

wātak, *Rongelap*, and *Utrōk*) (Pevec, 2006). All the documents relating to Castle Bravo Project 4.1 have since been reclassified.

The physical response of the 236 human beings on *Rongelap* who were exposed to radiation from Castle Bravo began to manifest a few hours after the explosion. Radioactive bits of coral fell on their island like snow. Children played in it, although it turned the well-water yellow (Evans, 1992). When the American military (in protective suits) arrived in the mid-afternoon on March 1 to take measurements using Geiger counters, they encountered Marshallese people who exhibited the symptoms of acute radiation poisoning (Winchester, 2015). At that time, the American military did not attempt to help any of the sick Marshallese. As it turned out, the Rongelapese, 100 miles from ground zero on *Pikinni*, had been dosed with about as much radiation as the Japanese victims that were only 2 miles from the ground zero of the Hiroshima explosion (Winchester, 2015). More than two days later, when it seemed as if all the Marshallese people on *Rongelap* Atoll might perish, they were offered assistance. The military (still in their protective gear) evacuated the atoll and repeatedly washed and checked the Marshallese with Geiger counters. The Marshallese people's hair and skin were in poor condition, their fingernails falling out (Evans, 1992), and they felt pain, burning, and itching from the radiation (Winchester, 2015).

Marshallese people still suffer from high rates of cancers and birth defects (Evans, 1992), although incidences vary by location (Land et al., 2010). It is difficult to determine the exact increase in cancer and birth defect incidences in the RMI due to nuclear testing because health conditions prior to the tests were not well documented (Yamada, 2004). The best estimate for the radiogenic increase in the incidence of cancer in the RMI is the 1.6% figure from Simon et al. (2010).

Smith (2005) in her book, *Conquest*, argues that radiogenic birth defects function as an indirect form of sexual violence against native women by taking away their reproductive freedom. Although some birth defects, such as undeveloped limbs, are nonlethal, there are

more severe conditions that were previously unknown to the Marshallese people. Because these were new maladies, they didn't have Marshallese words. The babies who were born without bones and with translucent skin, were described using metaphors from the island environment such as "jellyfish babies". In contrast, Barker (2013) describes the adoption of the English word "grape", *kiraap*, to describe hydatidiform pregnancies (also called molar pregnancies). Based on research done in the United States, the normal incidence of molar pregnancies should be about 1 in 1,500 pregnancies. They result in the spontaneous abortion (at around 3 months) of an undeveloped fetus that looks like a bunch of grapes. The risks to the mother include uterine cancer, high fevers, and loss of reproductive abilities. Exposure to radiation from atomic testing has resulted in an increased incidence of grape babies in the RMI (Barker, 2013). The exact number of radiogenic birth defects in the RMI is not known due to poor reporting by women, as well as the attitude of disregard for women's health issues held by many male medical professionals around the period of nuclear testing.

The Rongelapese were allowed to return to their home atoll three years after Castle Bravo, in 1957. Yet it was still contaminated. The US Department of Energy's first radiation report declared that the "habitation of Rongelap [*sic*] will afford most valuable ecological radiation data on human beings (Evans, 1992)."

In August of 1968, President Lyndon Johnson declared that the Bikinians could return to their home atoll as well (Winchester, 2015). Their homecoming did not last long however, as the Atoll was also still contaminated, forcing those who had returned to turn around and leave once more. Today *Pikinni* Atoll remains uninhabited.

Back in the United States, many American civilians found out about the plight of the Marshallese people on *Rongelap* Atoll just nine days after Castle Bravo when an article about it appeared in a Chicago newspaper (Winchester, 2015). Now people know much more about radiation in general than they did during the nuclear testing period. For example, after the first explosion at *Pikinni* Atoll, American military men were assigned to "clean" the residual radiation

off the old battleships that served as test targets using soapy water and mops. When reporter Ann Nakano visited *Mājro* a couple decades later, she was informed that soil from *Pikinni* had been taken to *Mājro* for construction purposes, and that the same equipment that had been used to clean radioactive waste on *Āne-wātak* was later being used in *Mājro* as well (Nakano, 1983).

Barker (2013) notes that the people in charge of the US Navy and the Marshallese people held different opinions of the Islands. To the Americans they were of negligible size, remote and isolated, and surrounded by miles of useless saltwater. There was little biodiversity in flora or fauna - even humans were in short supply. Furthermore, the climate in the northern part of the Marshall Islands where the atomic test sites were located is relatively dry and the soil unsuitable for Western-style intensive agriculture. The Americans didn't think that anyone could care much about such a place, but they underestimated the deep ecology of the Marshallese. The traditional Marshallese concept of the ecosystem includes people and land (Thaman, 2006). Instead of viewing their islands as sparsely populated, insignificant specks of dry land, isolated by miles of ocean, the Marshallese saw both their past and their future in their islands. Land was not something they bought and sold. It was a mother's legacy passed down through generations. It presented the opportunity to make a living using various natural resources. And the vast Pacific Ocean provided resources as well. It was both a source of seafood and a superhighway connecting every atoll. For centuries before the arrival of Westerners, the Marshallese people were able to live sustainably in their environment (Barker, 2013).

There is no Marshallese word for radioactively contaminated land. The word people sometimes use is the one that indicates the part of an atoll that faces the ocean and gets hit with wind and salt spray and is thus not favorable for habitation (M. Stege, Personal Communication, 2014).

There are now about 400 "Bikinians", people whose parents or grandparents were evacuated from *Pikinni* Atoll. In the RMI, they are settled mostly on *Kili* Island and *Ejit* Islet

(*Mājro* Atoll), places too small to lead the rural, Outer Islands lifestyle of agroforestry and fishing. Although it's unfortunate that they cannot live by fishing and collecting traditional plant foods, being some of the richest people in the RMI they can compensate by purchasing food. Their fortune also ensures that both *Kili* and *Ejit* have some luxuries such as electricity and internet service (Rudiak-Gould, 2009). One of the downsides is that the food available for purchase is not part of an ideal diet, and *Kili* is especially small, with no lagoon.

Several American writers have sensed a victim mentality among the Marshallese people, especially in the Urban Centers of *Mājro* and *Ebeye*. I believe it is possible to apply Historical Trauma Theory (HTT) to the Marshallese situation, although researchers have not yet done so. Sotero (2006:93) defines HTT as follows: "Populations historically subjected to long-term, mass trauma – colonialism, slavery, war, genocide – exhibit a higher prevalence of disease even several generations after the original trauma occurred." HTT originated in 1960s psychological studies of Holocaust survivor's families which revealed that trauma effects could be transmitted inter-generationally by physiological, environmental, and social mechanisms. Since then, the idea has been most commonly applied to Native American groups, but there have been a few applications among other groups such as Palestinians, Russians, Cambodians, and African Americans (Sotero, 2006). The symptoms of historical trauma, which may be genetically transmitted by changes in the uterine environment or DNA, are similar to those of Post-Traumatic Stress Disorder (PTSD). They include psychological issues such as memory loss, substance abuse, isolation, denial, grief, suicidal ideation, and guilt (Sotero, 2006). In addition, HTT can help explain the incidences of social and physiological problems such as poverty and type II diabetes. The legacy of colonialism, especially considering the nuclear testing that lasted over a decade, should qualify the Marshallese people as a historically traumatized population. There is plenty of evidence that they are experiencing the symptoms (Johnson, 2015). Relatively recently, geneticists have discovered that traumatic experiences don't affect only one or two generations. Environmental triggers can alter DNA expression (without actually changing

the molecule itself), enhancing or impeding the effects of various genes (Penman, 2015). This phenomenon is called epigenetics. It is similar to behavioral conditioning and historical trauma, except that it can be passed on to one's grandchildren and great-grandchildren. An example of an environmental trigger that can produce an epigenetic effect is a change in diet.

In total, sixty-seven atomic and thermonuclear bombs were tested in the Marshall Islands between the years 1946 to 1958, accounting for 80% of all US atmospheric nuclear tests (Barker, 2013). The nuclear explosions even altered the weather of the Marshall Islands (Johnson, 2013:373). As a direct result of US nuclear testing, some atolls in the RMI will remain uninhabitable for centuries to come. So even as the population of the RMI grows, there is less available land for it to grow into. Even land that has been designated as safe to settle may never return to its pre-testing productivity. On *Āne-wātak* Atoll, there is a large concrete structure known as the *Runit* Dome. It "contains" radioactive waste, except that it is not exactly doing its job. Because the dome is not lined, waste is leaking out of it and into the Pacific Ocean. Scientists have recommended that the soil on *Āne-wātak* be monitored for at least the next 100 years. The US Department of Energy (DOE) lab in *Mājro* recommends that people exposed to nuclear radiation be scanned at least once per year in one of their high-tech whole body scanners (Smith-Norris, 2016).

In 2014, Marshallese politician and Nobel Prize nominee Mr. Tony De Brum (1945-2017) led the RMI government in a lawsuit against the US and eight other nuclear-equipped countries for breach of the Non-proliferation Treaty (Mathiesen, 2017).

Current Issues

Tourism

Tourism is the largest industry in the world (Smith, 2001). It's not surprising then that Taafaki et al. (2006) list "tourism" as one of the principle industries of the RMI. Tourism is

simply when a person or group of people temporarily leaves their home for a different environment. The key element in tourism is travel (Graburn, 2001).

In the introduction to their volume on tourism, Smith and Brent (2001) state that tourism is a cultural universal. The early Marshallese people were ocean travelers. Little knowledge of their tourist activities survives today. In the past several decades, the focus on tourism in the RMI has been on those Westerners who flock to the Islands, especially Bikinni Atoll - now a UNESCO World Heritage Site - for unique scuba excursions. "Dive Bikini" is mentioned in the book, *Transit of Venus* (Evans, 1992). However, the author's description of the RMI as a "crazy, horrible place" can't have done much to encourage tourism (Evans, 1992:241). Elite divers can see sharks and the remains of the USS Saratoga. Tourists sometimes go ashore for a bit, but it is still too dangerously contaminated to stay there for an extended time period (Winchester, 2015).

One of the premier resorts in the RMI is the island of *Eneko*, about 25 minutes from *Mājro* by boat. It's run by the Reimers, a Marshallese family who also run the Hotel Robert Reimers on *Mājro*. Popular activities at the resort include snorkeling and kayaking. Modern diversions are limited since there's no internet connection, but telephone service is available (Takeuchi and Koning, 2010).

Enjoyable leisure activities such as radioactive snorkeling are only one of the many reasons that people who can afford it become tourists. It's also about experiencing (even if only for a moment) a different way of life (Graburn, 2001). A person who must get up at 7:00 am every workday when she is at home might sleep until noon when on vacation. MacCannell (2001) takes the search for a different lifestyle a step further when he writes about those who are interested in how other people, particularly those who are perceived to be quite opposite, live. For many Westerners, Micronesians fall into that category of being quite opposite. They exemplify the global Others that Said (1978) writes about in his book, *Orientalism*.

Several scholars of contemporary tourism have pointed out its mixed effects. On the one hand, tourism boosts local economies. Perhaps that isn't necessarily true for locations with all-inclusive mega-resorts but it's true in the RMI where almost all land is still held by Marshallese people. The RMI government has identified the country's steadily increasing tourism industry as one of the main areas of development, along with agriculture (Collison and Spears, 2010). Tourism also allows people to peacefully engage new ideas (Smith, 2001). On the other hand, tourism typically leads to decreases in both culture (MacCannell, 2001) and environmental quality (Smith, 2001).

Change as a constant

According to traditional Marshallese culture, both change and existence are cyclical in nature (Miller, 2010). Change is represented by the ocean's tides, which ebb and flow. However, the tides themselves are part of the Pacific Ocean, which represents the unchanging constant. One of the most fascinating aspects of Marshallese culture is its adaptability. To extend the ocean analogy, Marshallese people are able to "go with the flow" and "weather the storms" (with obvious limitations (Stege, 2017)). After centuries of social and environmental changes, the basic Marshallese cultural values, *mjanit Majol*, are still strong, just perhaps of a different form (Miller, 2010). Indeed, in Marshallese thought, things can change yet still continue to exist. Because of this, there are many "invented" traditions in the RMI that foreigners are more likely to notice than full-blooded Marshallese people (Miller, 2010). As an example, Miller refers to traditional Marshallese fashion. In the RMI, people accept that men have traditionally worn their hair short and that women's skirts hovered around their ankles. Old photos however, depict long-haired men and women wearing knee-length woven mats.

Technological and social change have upset the traditional gendered balance of work in the RMI (Hezel, 2013). Patterns of eating are different than they once were, as motorboats have replaced outrigger canoes on all but two atolls (*Namdik Atoll* and *Aelok Atoll*) (Miller,

2010). The workload of men has eased, however that of women has increased. Not only do they tend to home and family, but now they may go to work outside the home as well. The birthrate of the RMI today is about seven children per woman, which is high for the Pacific and on par with many other developing countries (Rudiak-Gould, 2009). Over the past two decades, poverty has become an issue in the RMI, especially in the Urban Centers where people live in overcrowded and unsanitary conditions (for example in the *Jenrok* area of *Mājro*) (Johnson, 2015).

Health

Some of the health challenges facing the population of the RMI are increasing incidences of alcoholism, suicide, obesity, diabetes, and leprosy (Rudiak-Gould, 2009) as well as teen pregnancy and sexually transmitted diseases (Johnson, 2015). The RMI is number one in Oceania for teenage pregnancies. It has the problems of a Third World country, despite a relatively high per capita income based on monetary reparations and aid from the US. Government corruption or inefficiency may sometimes keep the money from reaching the people and programs that most need it, such as the Ministry of Health's Family Planning Program (Johnson, 2015).

The change in diet and lifestyle is of course a huge factor influencing the health of populations around the world. In the RMI, approximately 45% of the population is obese, a risk factor for diseases such as type II diabetes. Diabetes may carry a stigma, so some people are reluctant to admit to themselves and their healthcare providers that they have symptoms. On the Outer Islands, people get exercise while gathering and preparing healthy foods such as fish, breadfruit, and coconuts. In the Urban Centers, there is little in the way of recreation and sports infrastructure. The roads are not conducive to jogging or bike riding. Ebeye is working on building a gym and a walking path but the only gym on Mājro fell into disrepair several years ago and has not been fixed (Johnson, 2015). The first president of the RMI, Mr. Amata Kabua,

described the free food handed out by the United States Department of Agriculture (USDA) as one of the worst problems facing his nascent country, telling reporter Ann Nakano (1983) that it led to a lack of motivation. Commodity foods like Mr. Kabua was talking about are not exactly “health foods”, as they are only meant to supplement a more traditional diet, but what the former president was more concerned with seems to be how their introduction affected the fabric of social life in the Marshall Islands.

Cancer

As a direct and long-lingering result of the US atomic testing regimen in the Marshall Islands, cancer rates in the population are high. Thyroid cancer is especially common. However, the general knowledge of radiation’s behaviors and effects, especially its effects on humans, remains weak. This poses a challenge for those trying to understand and ultimately receive compensation for their illnesses. There’s so much about radiation that scientists don’t know, but the burden of proving its precise effects seems to be not on the scientists, but on those who have suffered.

Environmental Change

In addition to being among the least biodiverse ecosystems in the entire world, the ecosystems of the Marshall Islands now are also some of the world’s most disturbed, as well as most infested with non-native species (Thaman, 2008). The latter problem has been documented in many other former colonies and dubbed “Ecological Imperialism” (Crosby, 2004). One of the arguments Crosby makes in his 1986 (revised in 2004) book, *Ecological Imperialism*, is that like the diseases the colonizers brought with them, their Old World plants, animals, and pests helped pave the way for their eventual rule of foreign regions by working together to outcompete formerly unchallenged indigenous species.

Global temperatures have increased relatively rapidly in recent decades due to human activities (e.g. burning of fossil fuels, deforestation) which add more and more heat-trapping

greenhouse gases to the atmosphere (Houghton, 2009). According to Hansen et al. (2005), the Earth will potentially experience a large rise in sea level as it heats up because of the expansion of heated sea water and the melting of polar ice (which actually creates a positive feedback by decreasing the amount of solar energy which the ice sheets would normally reflect). The low-lying Marshall Islands are especially vulnerable to rising sea levels resulting from global warming (Davis, 2014). By the end of this century, sea levels will have crept up by about two feet (over half a meter) (Winchester, 2015). The unvarying topography of the Marshallese atolls leaves the displaced population with nowhere to go to stay dry. They have to either move to a different country or drown. Davis's (2014) computer models have shown that even assuming the best-case scenario (low levels of greenhouse gases in the Earth's atmosphere), by the end of this century almost half of the RMI will be underwater (in her worst-case scenario, almost 100% of Marshallese citizens will have to move). Already, higher than average tides dubbed "king tides" are causing damage to Marshallese villages and crops (Mathiesen, 2017).

Global climate change also contributes to the increasing strength and frequency of tropical cyclones, called typhoons in the RMI (in the US they are called hurricanes) (Winchester, 2015; Davis, 2014). Typhoons are devastating to low atolls because they drive salty water into the vegetation and groundwater, creating the osmotic equivalent of a drought (the salt attracts the fresh water, keeping it away from roots and even drawing it out of leaves) (D'Arcy, 2006). Aside from severe storms, rainfall on average is decreasing in the Marshall Islands. As global change continues, the ocean will become warmer and more acidic. The Pacific Ocean is now almost as warm as it was one million years ago. Ocean warming leads to coral bleaching and changes in fish populations.

At the Paris Climate Talks in December of 2015, Mr. Tony De Brum and the delegation from the RMI adopted the slogan "1.5 to stay alive", declaring their aim to cap the increase in global temperatures at 1.5 °C. Although their cause was widely adopted, global temperatures

are already at about 1 °C above normal, so the future does not look promising for the RMI (Matheisen, 2017).

Albrecht et al. (2007) explain how environmental degradation can cause psychological distress, termed “solastalgia”, in people who must adapt to the changes in the land. The mental health effects of environmental disasters that cause chronic stress (i.e. drought) are feelings of hopelessness and powerlessness. However, solastalgia has yet to be given much attention by psychiatric experts.

Goodell (2017) notes that the US has the technology to combat sea level rise in the RMI, as evidenced by the fortification of the base on Kwaj following a flood event there in 2008. Unfortunately, desalinization machines and massive walls of riprap (fortified granite) do not come cheap. The RMI is financially unable to institute such measures on each of the country’s 29 atolls and 5 islands, surely a multi-billion-dollar effort for a nation that has been granted only about 6 million dollars so far to cope with climate change (from the World Bank). And anyway, improving the RMI’s infrastructure would provide only a temporary solution to the complex problem of global climate change.

Immigration

Despite high birth rates, especially among Marshallese teens, the population growth rate for the RMI actually decreased between the years 1999 and 2011. Researchers blame migration for the downward turn. One-third of Marshallese people currently live in the United States (Schwartz, 2015). Davis (2014) identifies three phases of migration from the Marshall Islands to the US. The first phase, from the 1950s through the 1960s, when the Marshall Islands were still a US Trust Territory, was characterized by heavy travel restrictions enforced by the US Navy. The second phase, starting in the 1970s, was motivated by educational opportunities, especially those afforded by the Basic Education Opportunity Grant (Pell Grant). Finally, after the 1986 COFA, Marshallese people came to America mostly seeking healthcare

and employment. Johnson (2015:20) refers to migration as Marshallese people “voting with their feet”. He recalls that the Marshallese culture discourages disagreement with political leaders. Many Marshallese people who don’t like the way their country is being run simply leave. For the past decade the migration rate has been about 1.5 % of the population (close to 1,000 people) each year. Unfortunately, not all RMI citizens have the ability to move. The cost of a plane ticket might be prohibitively expensive for some people, or their health might not allow them to travel. The displacement of Marshallese people due to climate change echoes the displacement that resulted from nuclear testing (Mathiesen, 2017).

With an estimated 10,000-plus migrants living there, the city of Springdale, Arkansas has the largest Marshallese population outside of the RMI. Other US states with large Marshallese populations include Hawaii and Oregon. Because migration can stimulate further migration, places with large Marshallese populations are said to have greater “pull” in attracting more Marshallese people. Thus, Davis (2014) has estimated that at least 5,000 more Marshallese people will move to Springdale in the next few decades. However, the number could be as high as 10,000. The second part of this chapter will go into more detail about the Marshallese community in Springdale. This dissertation will not be the first one generated from research on the Arkansas Marshallese community. There have been many professional and graduate studies, mostly centered on health issues, but a couple concerned with cultural issues such as music and performance (Schwartz, 2016).

The Internet and the Erosion of TEK

Despite high service costs and low rates of connectivity in the Outer Islands (OIs), the internet and especially the social media site, Facebook, have become very popular among the Marshallese community both in the Pacific (Cave, 2012) and in the US (McElfish et al., 2016). In addition to maintaining social connections over long distances, the internet has the potential to help provide health and educational access to geographically isolated regions (Spenneman,

2004). When it comes to the preservation and transmission of Traditional Ecological Knowledge (TEK), internet usage has both advantages and disadvantages. On the positive side, the Web can be a place for sharing knowledge, including sustainable farming and fishing techniques (Buenafe and Raab, 2005). However, English is the dominant language of the internet, and many webpages featuring information about Micronesia are not written in Micronesian languages (Spenneman, 2004). Thus, one has to wonder exactly who the TEK is being shared with. Long ago, much of Marshallese TEK was safely held by certain respected individuals or families. Now, posting Marshallese TEK on the internet for everyone to see could lead to biopiracy, the exploitation of TEK for the gain of non-Marshallese people, and over-harvesting of native plants (Taafaki, 2008). Sujarwo et al. (2014) found that in Bali, Indonesia, internet and smartphone usage were negatively correlated with the amount of TEK people held. The researchers concluded that the recent increase in globalization obviated the need for Indonesian villagers to retain TEK.

Overview of Existing Marshallese Studies

As far as research studies based in the Marshall Islands, there have been several notable ones in the past two centuries. During the period when many of the Micronesian islands were Spanish territories anthropology in the region was limited (Rainbird, 2004). Then the Germans became interested in Micronesia. The German botanist Adelbert von Chamisso wrote the first in-depth description of the Marshall Islands in the early 1800s (Rudiak-Gould, 2009). Since then, a number of American and Pacific Islander scientists have studied the vegetation in various locations in the Islands (Thaman, 2008). A fairly recent series of publications included ethnobotanical information from different atolls. In addition, Taafaki et al. (2006) wrote a book about Marshallese ethnopharmacology, with an emphasis on the role of women.

Kiste and Marshall (1999) partition the work of American anthropologists in Micronesia into two phases. First, they consider the time period of the second World War through the

1950s, when research was typically government-sponsored and preoccupied with applied issues. American anthropologists dominated the Micronesian scene during this period because the region was so strictly controlled by our Navy during WWII and the Cold War that Americans were the only ones who could obtain security clearance to enter (Alkire, 1999). In 1947-1948 the US Navy sponsored the Coordinated Investigation of Micronesian Anthropology (CIMA), with a research team over forty strong (Rainbird, 2004). The idea behind the CIMA effort was that knowledge about America's Micronesian territories would help with governing them. After CIMA there was a second massive research project, the Scientific Investigation of Micronesia (SIM), in 1949-1951. Some of the most prominent American anthropologists in Micronesia during the start of the US colonial period first arrived in the region as part of the military, then after the war, they stayed there to do research (Marshall, 1999b). During the 1950s, Micronesia (only 1,000 square miles of land area, remember) was studied by seventeen different American anthropologists – all bankrolled by the government (Rainbird, 2004).

After WWII, American anthropology itself was shifting to more empirical approaches (Marshall, 1999b). The anthropological studies of Micronesia have been based in this type of anthropology, even recently. Micronesian studies of the 1960s and forward have been more academically-inclined and less practically motivated. Petersen (1999) applauds the descriptive work of American Anthropologists in Micronesia, but he notes that such work tends to exoticize the Micronesian people. Rubinstein (1999) explains that it's become more fashionable for graduate students to study in areas other than Micronesia (he suggests Honolulu or Philadelphia) because it is easier to find jobs in these areas.

As far as Marshallese foodways research, there is a bit of a gap in the literature. Rubinstein (1999) explains that early efforts, in the 1940s, were concerned not with Islanders' health but with that of US military personnel stationed in Micronesia. The first studies found that protein may have been a limiting factor in the Marshallese diet, due to wartime disruptions of the traditional food supply. Nancy Pollock has done some in-depth work, particularly as a graduate

student for 15 months in 1968 and 1969 on *Namu Atoll* for her dissertation, *Breadfruit or Breadwinning on Namu* (Pollock, 1992). In addition, Carucci (1997) explained how food figures into rituals in the RMI. The late Lois Englberger produced many ethnobotanical studies on Micronesian staples such as breadfruit and pandanus. Still, Kiste (1999) calls out the need for more studies on the effects of imported foods on the health of Micronesians.

Marshallese foodways and culture are so intertwined that most of the sources I've encountered have included at least a cursory mention of the staple foods. I've teased out quite a few impressions of Marshallese food from the monographs of non-Marshallese visitors to the Islands. In addition, food often plays symbolic roles in Marshallese folk and fairy tales (*bwebwenato* and *inōñ*, respectively). Tobin's (2002) collection has been especially powerful as a source of information on how foodways are related to Marshallese culture and values, because it is so carefully annotated.

While there was a noticeable dearth of women researchers in Micronesia in the beginning and middle of the 20th century, the number of women in the field has been steadily growing since the 1970s (Marshall, 1999b). This work aims to be the first study of Marshallese foodways and culture in Arkansas's Marshallese community. In 1997, Allen became the first researcher to write about a Marshallese community in America with her dissertation focusing on the group living in Enid, Oklahoma, which is about a 4-hour drive from Springdale.

Welcome to Springdale

A map of the United States with a red dot in Arkansas labeled 'Springdale, AR'. The map is blue with black outlines for the states. A red dot is located in the eastern part of Arkansas, and a white speech bubble with a black border points to it, containing the text 'Springdale, AR'.

A map of Northwest Arkansas showing major cities, highways, and county boundaries. The map includes the following cities: Bella Vista, Bentonville, Rogers, Springdale, Fayetteville, and Fort Smith. Major highways shown include US-412, US-62, US-16, US-22, US-540, and I-40. County boundaries are marked with dashed lines, and the names of the counties are labeled: McDonald County, Barry County, Missouri, Arkansas, Delaware County, Benton County, Carroll County, Washington County, Madison County, Adair County, Franklin County, Sequoyah County, Crawford County, Logan County, and Sebastian County. The map also shows the state boundaries between Oklahoma and Arkansas.

Springdale is a city of almost 70,000 people. It is located along I-49 in the Northwest corner of Arkansas, in between college-town Fayetteville in Washington County, and rapidly-developing Rogers in Benton County. This little collection of cities lined up on the interstate, dubbed “NWA” for short, is geographically and culturally a part of the Ozarks, the Midwest, and the South. It shares traits with all three regions. NWA also includes the old outpost of Fort Smith to the South and Walmart’s hometown, Bentonville, to the North. Of this chain of towns, Springdale is the most industrial and the least gentrified. It has the dubious distinction of being “The Poultry Capitol of the World”, as several major poultry processing companies have made their homes in Springdale, including Tyson (the city’s largest employer), George’s, and Cargill. Thus, it has earned the affectionate nickname, “Chickendale”.

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for the Marshallese population of Springdale top ten thousand people (McElfish et al., 2016), making Springdale home to the largest community of Marshallese people outside of the Republic of the Marshall Islands (RMI). There are concerns that the population is underreported in the census because of cultural differences in family composition (Duke, 2017). For example, a Marshallese family in Springdale may have young relatives living with them and attending school, and the family may be afraid to admit the true number of household occupants if they suspect that their landlord would not approve. Following the Marshallese migrants, other Micronesians have settled in the Springdale area as well, including people from Ponape and Chuuk.

In the US, Pacific Islanders from Polynesia, Melanesia, and Micronesia (subgroupings which are each quite varied within themselves) are all lumped together for demographic counts, similar to the way that people from China, Taiwan, Japan, South Korea, and Laos are all considered “Asians”. From the 1970s – 1990s, the US Census Bureau included Pacific Islanders in the same group as Asians, but by the year 2000, Pacific Islanders had their own group (Spickard, 2002). Most of the Pacific Islanders living in the US are Polynesian, the Pacific Islander subgrouping that includes Hawaii, New Zealand, Tuvalu, Easter Island, and most of the countries in between them. That is because the US takeover of Hawaii in 1959 incorporated the Polynesians who were living there at the time. However, most Pacific Islanders in the US today consider themselves multi-ethnic. Islanders have a long history of traveling around Oceania with disregard for Western political boundaries (Spickard, 2002b).

Approximately one third of Marshallese people now live outside of the RMI (Johnson, 2015). Besides Arkansas, the US states with significantly large Marshallese communities include Hawai'i, California, Oregon, and Oklahoma. Obviously, Hawai'i is also home to many Hawaiians, and California, Oregon, and Oklahoma have groups from other Pacific Island nations as well as from the RMI. Arkansas never had that diversity. Therefore, when Marshallese people came to Springdale, they found themselves without an existing model to

follow (Schwartz, 2015). Integration and assimilation have been relatively slow for the Marshallese community in Springdale because they are still figuring things out.

Although Marshallese people in Springdale could be called "immigrants", people motivated to move to the US for economic reasons, they are classified according other terms as well. The political term is "migrants". "Climate change refugees" is another popular label, playing off the fact that refugees are those who are escaping from dangerous situations in their home countries (Espín and Dottolo, 2015). The Bikinians living in exile on *Kili* Island and *Ejit* (*Mājro* Atoll) explicitly stated in 2015 that they wished to migrate to the US because of extreme flooding in both settlements (Johnson, 2015). However, according to international law, issues of climate change do not confer official refugee status (Goodell, 2017). Furthermore, Kelman et al (2015) note that despite the stone-cold necessity of their having to move because of rising sea levels, the term "refugees" takes away the agency of the migrating population. The researchers point out that people have been moving around Micronesia for centuries regardless of climate.

Despite the insular nature of the Marshallese community in Springdale, outsider awareness is growing. Reporter Jaqueline Froelich covers the "Marshallese beat" for the local NPR news station, presenting stories on Marshallese issues and events to the broader NWA community. Non-Marshallese Arkansans are both curious and concerned about these relative newcomers from the North Pacific. "People want to learn about the Marshallese because they think that sea level rise will send thirty thousand of them to Arkansas tomorrow (A. Brown, 2015, Personal Communication)." It is unlikely that such a large and sudden population shift would occur, because most Marshallese people are deeply attached to their homeland and do not wish to leave the RMI. Yet journalist Jeff Goodell (2017) points out that with the COFA in place, there is at least the possibility that entire population of the RMI *could* move to Arkansas.

History

Springdale, originally called Shiloh, was first officially settled by people of European ancestry in 1838. Before that, it was part of the territory to which the Cherokee had been relocated. It was illegal for Euro-Americans to live there before the Native Americans were forced farther west, but some did anyway (Brotherton, 2002). Springdale remained a relatively small town until the later part of the 20th century.

Northwest Arkansas was predominantly populated by Euro-American people prior to 1990. Springdale was still considered a “sundown town” back then (about thirty years ago), where brown-skinned people were not welcome after dark. A racist sign used to hang on the railroad bridge over US 71B (Thompson Avenue). Then Latinos began to arrive in Springdale seeking work in the poultry industry. In just 20 years, the population of NWA doubled, and many of the newcomers were not Euro-American. Many of them were not even American citizens.

In the 1980s, after the US allowed Marshallese people to leave the Islands, the first Marshallese person arrived in Springdale. His name was John Moody. Mr. Moody had a scholarship to attend an Oklahoma university, but dropped out of school and found work at the Tyson chicken plant. He told his friends and family members back in the Marshall Islands that Springdale was a good place to come, and they came. Today, Mr. Moody lives in Clarksville, AR, a small town about a 2 hour drive South from Springdale. Most Marshallese in the US are first-generation (Ratliffe, 2011) or 1.5-generation (people who were born in the RMI but moved to the US as children).

In the year 2000, Marshallese migration to Springdale increased due to very high unemployment rates in the Marshall Islands (about 30%). Also around that time, the COFA was coming up for renegotiation and many Marshallese people worried how that would affect their

ability to travel. In 2001 Tyson was accused of human trafficking and sought to redeem itself by actively recruiting workers from the RMI whose legal statuses were clear (Schwartz, 2015).

Why Springdale?

Arkansas has a lower cost of living than Hawai'i or California (Thomas, 2008b). Johnson (2015) reports that Marshallese people living in mainland US states are faring better than those who settled in Hawai'i and Guam. Marshallese people in mainland states generally have higher household incomes than those in the Pacific territories and thus they are less likely to need food stamps or housing assistance, and to commit crimes (Johnson, 2015). Springdale has a large and established Protestant population. The city has plenty of opportunities for entry-level employment that don't require a college degree or fluency in English, particularly at the poultry processing plants. The US in general has better healthcare opportunities than the RMI. There is no oncologist in the Marshall Islands. One of the doctors at the University of Arkansas for Medical Sciences (UAMS) in Fayetteville is Marshallese. Additional factors that pull Marshallese migrants to Springdale include environmental stability and rejoining family members who previously came here.

Another pull factor is education. Throughout Micronesia, education was traditionally the process by which elders orally passed on their wisdom to youths (Ratliffe, 2011). Thus, Micronesians culturally have different views of education than do Americans. Public school in the RMI is only mandatory until age 14, or the eighth grade (even then, attendance may not be strictly enforced). There are only 3 public high schools (1 in Mājro and 2 in the Outer Islands), and less than a dozen small private high schools in the RMI. The public high schools may be competitive to attend, despite being poorly funded. There is one college in the RMI, the College of the Marshall Islands in Mājro, a two-year program with room for less than 500 students. Ratliffe (2011) places the blame for the poor quality of schools in the RMI squarely on the US, which offered scant funding and unhelpful policies toward education when the Marshall Islands

were its Trust Territory, building a weak foundation. Although many Marshallese people move to the US to further their education, their attrition rates at US colleges are high (Johnson, 2015). Public schools in the RMI usually perform lower than those in the US, providing poor preparation for US college programs. Also, the lure of entry-level jobs, such as those in Springdale's poultry industry, is a strong temptation. Furthermore, it may be difficult for migrant students to simultaneously exist in both their home culture and that of the typically more diverse US classroom. Ratliffe (2011) notes that American teachers often (incorrectly) view ethnic minority students and their families as not valuing education. A former English teacher at one high school in Springdale mentioned that in addition to cell phones, she often had to confiscate ukuleles from her Marshallese students during class. Springdale public schools started to beef up their English as a Second Language (ESL) programs in 2001 after a decade of exponential growth in the Latino population (Brotherton, 2002). Today there are ESL programs for Marshallese speakers at both the schools and the Springdale Public Library. There are also basic Marshallese language classes offered by both local nonprofit group, the Marshallese Educational Initiative (MEI), and UAMS. Non-Marshallese people enroll in these courses to help them communicate with their Marshallese students, employees, patients, adoptees, and friends in Springdale.

Effects of Migration

There are both positive and negative aspects of migration (Espín, 2015). One of the most significant negatives is the sense of loss. Topophilia is the technical term for the feeling humans have of deep attachment to a particular place (Kelman et al., 2015). Homesickness is an expression of topophilia for a place from which the subject is absent. Symptoms of homesickness such as depression are caused by the loss of connections to family, friends, culture, and the environment.

According to Thomas (2008b), there are a few reasons why migration from the RMI to the US has been mostly positive for both places. In the RMI, the population pressure is somewhat relieved. Relatives living in Springdale send money and goods to the Islands as frequently as they can. These remittances help maintain strong ties between friends and relatives living on opposite sides of the world. The strength of ties to the RMI serves as a form of social capital in the Springdale community and other Marshallese communities in the US (Hess et al., 2001). Money also flows from the RMI to communities in the US and elsewhere. Migrants can chase new and better opportunities for themselves and their families through education and employment in the US. Sometimes they return to the RMI and secure good jobs there (Johnson, 2015). One of the stipulations of the college scholarship offered by the government of the RMI is that graduates of foreign universities return to the Islands to work for a designated period of time.

One major problem with the migration situation is that it is only a temporary solution, not a sustainable one (Thomas, 2008b). Another issue is that although Marshallese people have a long history as voyagers, many of them now also have a shorter history of forced relocation due to nuclear testing (Johnson, 2015).

Marshallese Families in Springdale

In 2002, Fitisemaneau et al. conducted interviews with Pacific Islander families in Hawai'i to get a sense of their typical behaviors. Although their group of interviewees did not include any Marshallese people, they did have people from Kiribati representing Micronesia. The researchers found that most of the Pacific Islander-Americans they interviewed held similar beliefs, regardless of which country they came from. These beliefs included a daily life concentrated on the nuclear family, yet a uniquely Oceanic dependence on the broader family network for advice when big decisions needed to be made, and for cultural gatherings such as funerals. Furthermore, the Islander-American families all adhered to a rigid power structure that

valued children showing the proper respect to parents, women to men, and younger siblings to older siblings. Kindness and caring were found to be very important family values, although they were rarely expressed verbally. Fitisemaneau et al (2002) go on to note the physicality of Pacific Islander-American family relationships, although they also admit that there is a trend toward less hitting and more verbal communication, as the values of American culture are adopted by the more recent generations. American values also include a stronger focus on the nuclear family (Fitisemaneau et al, 2002). In Springdale, Marshallese families are becoming more similar to non-Marshallese, American families by focusing more on work and having fewer children than their counterparts back in the RMI (Perez Williams and Hampton, 2005).

Community

Springdale has so many churches that it has been called “a city of churches” (Brotherton, 2002). There are over thirty different Marshallese churches in Springdale. Schwartz (2015) suggests that in Springdale, one’s church affiliation replaces one’s island affiliation, a major component to Marshallese identity. On Christmas, several Springdale churches may come together in celebration. It was suggested that the Marshallese community in Springdale is stronger, closer, and more involved than the one in Hawaii because the churches here cooperate better.

Integration

People who move to Springdale from the RMI are not only migrants, as much strangers in a strange land as people can be in this globalized age, but they also have to deal with the intersectionality (Dottolo and Dottolo, 2015) of being poor and brown. Their skin color and clothing choices may prevent them from blending in to NWA’s predominantly Euro-American crowd. Most Marshallese women in Springdale wear colorful mumus, long shapeless gowns with puffed sleeves, out and about town. The dresses are beautiful, comfortable, and forgiving. In place of the mumu, some women wear longer, flowy, Western-style skirts and T-shirts. Of

course some younger Marshallese women, and girls, do wear jeans, leggings, or other Western pant styles around town and to community gatherings such as *keemems*. In Springdale, most Marshallese women pile their long black hair up into a messy topknot, sometimes with a plastic comb or faux flower stuck in for decoration. Fashionable women's outfits are accessorized with big earrings, often handmade in the RMI. Both Marshallese women and Marshallese men wear flip flops year-round, even though winter temperatures in Arkansas may dip below freezing. Because of their skin color and distinctive sartorial style, it is easy to visually identify the Marshallese people who may be present in Springdale's various public spaces. Even on the roads, Marshallese vehicles stand out by the leis hanging from their rearview mirrors.

The Marshallese community in Springdale has a history of insularity (Schwartz, 2015). They don't just look different from non-Marshallese people, they act differently too. Marshallese people may be very active in their community, participating in church events and sporting matches, and enjoying time with their families. However, many choose not to mingle with non-Marshallese people because of language barriers, mistrust, or fear. The stereotype is that Marshallese people are "shy". Most Marshallese in Springdale live in the east side of the city in multi-family buildings or rental houses among other Marshallese people (Schwartz, 2015).

Marshallese people in Springdale have higher rates of Hanson's disease (leprosy), tuberculosis, and STDs than the broader US population, because they may carry these conditions with them from the RMI, which has a less developed healthcare system. Because of these diseases, some non-Marshallese people in Springdale view their Marshallese neighbors with fear. They may think that Marshallese people tend to rely too much on traditional Marshallese medicinal practices as opposed to seeking treatment at local hospitals (Schwartz, 2015). In reality of course, there are many factors affecting the health of Marshallese people in the US. Still, the fear of "contamination" by Others is a common cause of xenophobia. Marshallese people in Springdale also have a bad reputation with the local police department and non-Marshallese business owners. Common complaints against Marshallese people in

Springdale include noise violations (because Marshallese parties tend to run late), driving without a license, and shoplifting.

Marshallese people like to hang out with other Marshallese people, as is true for most cultural groups. Humans generally enjoy the company of people who speak the same language and share some common ground. A little bit of hesitation to interact with strangers is perfectly normal. Also like humans from most every group, Marshallese people are friendly and welcoming to all those who are interested in learning more about their culture. Visitors, who are advised to take off their shoes before entering a Marshallese home, are adorned with beautiful woven crowns and shell necklaces and treated hospitably.

Community Health

The rate of type II diabetes has been reported to be as high as 50% for Marshallese adults, compared to under 9% for Americans on average. Perez Williams and Hampton (2005) showed that the health of Marshallese migrants was threatened by their relocation to Springdale (a common side-effect of migration). Marshallese people in Springdale face several challenges in securing quality healthcare, including language barriers, prejudicial treatment, lack of transportation, and lack of health insurance from employers (it is estimated that as few as 20% of Marshallese people in Springdale have steady health insurance) (McElfish et al., 2016). However, it is somewhat difficult to quantify the health of the Marshallese community in Springdale because they are often entered into the statistical records as “other” (Perez Williams and Hampton, 2005).

Creating a healthy home environment is difficult as well for many Marshallese migrants who don't have the high living allowance required to buy fresh foods. Without the foundation for good health, and without easy access to quality healthcare, people may tend to wait until their situation becomes extreme before heading to the hospital. Recently, the state government of Arkansas voted to include Marshallese children in their ARKids First program (Kamper, 2018),

which helps cover healthcare costs for youths. Marshallese adults remain ineligible for Medicaid and Medicare.

Legal Problems

As migrants, it is sometimes difficult for Marshallese people to adjust to the customs and laws of the US. For example, many Marshallese people have been accused of driving a vehicle without a valid license. Driving is necessary in Springdale, because public transportation is limited. Furthermore, in the US there is an emphasis on punctuality that is not found in the RMI. Here, people are punished if they do not make it to work on time. Still, the Department of Motor Vehicles in Springdale does not offer a Marshallese language driving test, although they do offer one in both English and Spanish. The Arkansas Coalition of Marshallese (ACOM) now holds classes to teach Marshallese people how to pass the driving test. Predatory lenders have viewed the increasing population of migrants as an opportunity, and many Marshallese people have fallen prey, because of the strong need for transportation in Springdale. At a community dinner, I met some young lawyers who are helping migrants fight against unjust car companies. There is only one certified legal translator for the 10,000 or so Marshallese people living in Springdale.

School and Business Involvement

Marshallese people in Springdale are not involved in the education and business opportunities around NWA in a rate proportional to the size of their community. Although it is only a 15-minute drive up I-49, only one Marshallese employee works at the Walmart Corporate Office (M. Laelan, Personal Communication, 2014). Only five Marshallese students attend the University of Arkansas, the state's flagship university (also about a 15-minute drive from Springdale) (A. Brown, Personal Communication, 2014). However, there is another handful of Marshallese college students at the Northwest Arkansas Community College (NWACC) in Bentonville. Some Marshallese students attend other small colleges in the area.

Marshallese involvement in area schools and businesses is slowly increasing. The number of Marshallese students registered for college classes climbs every year. Springdale Public Schools recently hired their first Marshallese teacher, and a Marshallese physician has begun to practice in NWA as well.

Resentment and Subtle Racism

The boom in Springdale's Marshallese population in the 2000s stirred up mixed feelings among the non-Marshallese (Schwartz, 2015). Some saw the newcomers as exotic. Others felt they were somehow amoral because of their associated health conditions, or lazy and living off regular checks from the US government. Many Euro-American people in Springdale seem to have difficulty telling the difference between Marshallese people and Latinos. Both groups have brown skin and dark hair, and they both speak languages other than English. I have encountered well-meaning Euro-Americans who couldn't tell the difference between Spanish and the Marshallese language.

Overt Racism

Marshallese people tend to behave shyly and thus make easy targets for bullies. Several Marshallese people have repeated for me the horrible things said to them by Euro-American and Latino peers in high school or at work. The taunts range from making fun of the Marshallese person's English proficiency to alleging the superiority of the US by reminding the Marshallese person of the history of nuclear testing.

Cultural Hub

Springdale is a political hub for the Marshallese population in the US. An RMI Consulate was established on Spring Street, just off Emma Avenue, in 2009, replacing the consulate in Costa Mesa, CA (Schwartz, 2015). One other consulate currently exists in Honolulu, HI, plus the RMI Embassy in Washington, DC. In addition to being a center for Marshallese political activity, Springdale is on track to become the epicenter of Marshallese culture in the US.

Vu and Voeks (2012) explain how the "Little Saigon" region of Orange County, CA became a hub for Vietnamese culture because it houses the largest Vietnamese population outside of Vietnam. Thus, Springdale could become a cultural hub for the Marshallese. This distinction is bound to grow with the addition of Marshallese restaurants and access to other Marshallese goods and services (e.g. practitioners of traditional Marshallese medicine), and ultimately, part of the city may become a tourist destination similar to New York City's Chinatown.

Springdale is popularly described by its Marshallese residents as 'A New Island' (Schwartz, 2015:786). More businesses are targeting the Marshallese community with Marshallese language advertising and services (Schwartz, 2015), including banks, car dealerships, and cell phone stores. In church community rooms or at event centers, there are *keemems* practically every Saturday night. Marshallese people joke that non-Marshallese people must think they are all born on Saturdays.

Espín (2015) refers to the work of Hobsbawm and Ranger to make sense of the new or "invented" traditions that immigrant communities frequently create. Although newcomers are not the only groups who invent traditions, their invented traditions serve the unique purposes of recalling and preserving the values and beliefs of the home country. Sometimes the invented traditions of immigrants mimic the way things are done back home, or a way of doing things that isn't practical to do there anymore. For the Marshallese, environmental concerns necessitate the latter. For example, poultry and or pork may be served at Springdale *keemems* in place of reef fish.

The Springdale Foodscape

Although explorers, whalers, missionaries, and colonizers introduced various new foods to the people of the Marshall Islands, it wasn't until WWII that the Marshallese diet drastically

changed and imported food products began to replace traditional Island staples. Now in the RMI, grocery stores sell canned corn beef, rice, soda, and ramen. However, the selection of low nutrient/high calorie foods available in the RMI is nothing compared to the vast array of junk foods offered by the Springdale Dollar General, not to mention the much larger local Wal-Mart. There are simply more of such processed food items available in wealthier countries (Friel and Lichacz, 2010). Coupled with decreased opportunities to expend excess calories, the environment in Springdale is obesogenic, especially when compared to that of the Outer Islands in the RMI. There are more cars in Springdale than in the urban centers of the RMI. Furthermore, as is common in the world's wealthier nations, recommended foods to eat for good health are more expensive than processed foods (Friel and Lichacz, 2010). Marshallese people in Springdale may eat the same meal of canned corned beef and rice, dressed with ketchup, as they would eat in the Urban Centers of the RMI.

Obesity is a biocultural phenomenon. Aside from the availability of various foods in the environment, some of the additional conditions that have been identified as likely to promote obesity are marketing, low socio-economic status, soft drink consumption, eating large meals, dining out, dieting, and drinking alcohol (Lockie and Williams, 2010).

Food Programs

Seventy-seven percent of Marshallese families in Springdale live below the poverty line (A. Brown, 2017, Personal Communication). Some of the food programs that exist in Springdale to provide fresh foods to underserved populations include the Springdale Farmer's Market, which sells local produce and accepts "food stamps", and Seeds That Feed, which collects unsold produce and redistributes it throughout the community. A few Marshallese churches in Springdale have community gardens. A study on a Marshallese community garden in Dubuque, IA showed that the garden improved the health and wellness of those who tended it

(Weltin and Lavin, 2012). Their type II diabetes symptoms subsided. Since most Marshallese people in Springdale live in apartment complexes, few, if any, have home gardens.

Breast-feeding

Most researchers agree that breast milk is by far the best nourishment for babies, although infant formula may be a suitable alternative (Boué et al., 2018). A recent study by Scott et al (2016) highlighted some of the barriers to breast-feeding experienced by Marshallese mothers in Springdale. These barriers serve to reduce the rates of breast-feeding in Springdale compared to those in the RMI, increasing babies' risk for Sudden Infant Death Syndrome (SIDS), diabetes, respiratory infections, and obesity. Some of the barriers to breast-feeding identified by Scott and her team were work schedule, wanting to fit in and be accepted by the non-Marshallese community, decreased milk production due to poor diet, and lack of traditional support systems.

Eating Out

The canned foods and ramen that are available in the RMI are relatively cheap in the US. Some smaller ethnic stores in Springdale carry the same brands familiar to Marshallese shoppers. Larger chain stores such as Aldi and Walmart carry even cheaper house brands.

Marshallese people in Springdale may also buy some types of frozen reef fish from one of the town's many Asian grocery stores. Two of the larger most popular establishments are Tang's and Asian Amigo, both on Thompson. There are also numerous Mexican and Salvadoran markets in Springdale. The manager of El Patron Market on Thompson Street reported that a significant percentage of her clientele were Marshallese. Other major supermarket chains in the city include Harps and Price Cutter.

A lack of familiar foods in a new place may be a source of pain for migrants. However, when such foods are available, they may serve as a way to maintain contact with the home country and alleviate homesickness (Espín, 2015). Although some prepared foods are

available at the Marshallese grocery stores (banana bread, *tonaa*), there is currently no Marshallese food restaurant in Springdale. At one point there was one, but it has closed (C. Chonggum, 2014, Personal Communication). Harbottle (2000) explains that the success of any restaurant serving ethnic food is partially tied to stereotypes about the group that the food represents. In Springdale, the Marshallese have been viewed with curiosity and suspicion. But the social scene is slowly changing. One Marshallese businessman in Springdale expressed plans to make part of his grocery store into a Marshallese restaurant in the near future. Currently, some of the favored dining-out places of Marshallese people in Springdale are the Panda (IV) Chinese buffet and other Chinese restaurants. Chinese food is said to be popular with Marshallese people because it comes with rice.

Drinking

In Springdale, many Marshallese people drink bottled or filtered water. A large jug of filtered water can be very cheaply filled at Harps. In Northwest Arkansas, the Beaver Lake reservoir “turns over” in early Autumn, causing the tap water in cities such as Springdale to develop an unpleasant taste and odor (even though it’s still safe to drink). I suggested that this influx of funky organic materials into the city’s water was the reason for the popularity of bottled and filtered water in Springdale. However, people more familiar with the Marshall Islands believe that it is a custom brought over from the urban centers (Mājro and Ebeye) where the tap water is not safe to drink (if it is even available). Migrants from the RMI’s urban centers are accustomed to drinking bottled or filtered water, however, those from the Outer Islands are not. People who live in the Outer Islands still rely on wells and rain catchments.

Many Marshallese people in Springdale abstain from alcohol. They claim that sobriety is part of their Christian faith. However, drinking alcohol is reported to be more common in the RMI than in Springdale. Belonging to a church and adhering to the behaviors that requires may

be more important in Springdale than in the RMI, where a sense a belonging is not as difficult to come by.

Chickendale and Coolers Full of Fish

Chicken and other types of poultry such as Cornish hens are popular in Springdale because they are a ubiquitous and relatively cheap source of protein. Hot dogs are also more popular in Springdale than they are in the Marshall Islands. Back in the Islands, chicken is mostly reserved for special occasions such as *keemems* or holidays. A WorldTeach volunteer on Jālooj Atoll recalled dining on a typical party meal of a quarter leg of chicken with rice, lunch meat, and fish. In Springdale, the roles of chicken and fish are reversed. In the US, chicken is the more common meat (typically boiled or barbequed) and fish is more for special occasions. Marshallese people in Springdale love to joke about their visiting relatives packing coolers full of island foods such as reef fish and breadfruit or pandanus. The local airport, XNA, is a fascinating place to observe the trade of proteins between NWA and the RMI. Coolers full of fish do indeed circulate on the baggage claim belts. And just the other day, a Marshallese family bound for the RMI had to take a pack of frozen chicken quarters out of their cooler to get it within the allowed weight.

Dottolo and Dottolo (2015) state that home foodways may remain strong in immigrant families even after home languages fade out. Foodways are usually the last memories of the home country to be let go. The Dottolos credit this phenomenon to "Social Identity Theory", wherein people define themselves in part according the groups they are members of and the value they place on that membership. These identities are merely imagined (but not imaginary) in that they are socially constructed. Therefore, adherence to traditions, whether those traditions go deep or were recently invented, is important to a person's self-image.

Anthropology "At Home"

I've not yet visited the RMI, but I drive through Springdale almost every day on my way from my home in Bentonville to the University of Arkansas in Fayetteville. The spatial difference between myself and the Marshallese community in Springdale is only about 20 miles. This represents a relatively new trend in anthropological research, in which I as the researcher am at least marginally included in the other group that I study (Peirano, 1998). While my fellow graduate students spend their summers in exotic places, I get to remain comfortably close to home. The advantages to this arrangement are that I can maintain strong bonds with my Marshallese friends in Springdale by visiting with them as our schedules permit – and I can easily defer to them when I have questions about their foodways and culture. In addition, the bonds between us are strengthened by the overlap of our spheres. We shop at the same stores (the Goodwill in Rogers), we navigate the same roads, we are under the influence of the same local politicians, and so on. One disadvantage to this kind of work environment is that it's generally only "acceptable" in the US and Europe. Citizens of other countries are not considered qualified to conduct anthropological research on their own turf (Peirano, 1998).

FOOD AND FOODWAYS

“I’ll tell you / why everyone here hates / Micronesians / It’s cuz we’re neon colored skirts
screaming DIFFERENT! / ... / Different like parties / with hundreds of swarming aunties,
uncles, cousins / sticky breadfruit drenched in creamy coconut / coolers of our favorite
fish / wheeled from the airport / barbequed on a spit / my uncle waving me over / *Dede a
itok! Kejro mona! / Dede come! Let’s eat!*”

Excerpt from *Lessons from Hawaii* by Marshallese poet Kathy Jetñil-Kijiner

Food is the nourishing material that living organisms consume, nourishing not only for the physical body but for the soul, or essence (which Americans believe lies in the heart, and Marshallese people believe lies in the throat), of a human being. Scholars may disagree about the position of food in the hierarchy of things that are fundamentally important to human culture: Is it more or less significant than say, language? However it ranks, the importance of food to both culture and biology cannot be overstated.

Although foodways (all the habits surrounding the procurement, processing, and enjoyment of food) have been studied by researchers from a wide range of disciplines, it is anthropology that has led the charge. Sutton (2001) suggests that both the archaic and the everyday aspects of foodways are what make them so tempting to anthropologists.

Foodways are bio-cultural

The thesis of Anderson’s (2005) book, *Everyone Eats*, is that foodways are determined by both biological and cultural factors. That is, they are “bio-cultural”. Biologically, humans must take in food that meets at least the basic needs of their bodies. Biological needs, coupled with physiological limitations, lead to the “omnivore’s dilemma”, popularized by Pollan (2007). Humans are generalists in that they cannot survive off of just one food source (like koalas rely solely on eucalyptus or pandas on bamboo). Furthermore, they have proven their digestive systems to be quite adaptable to most any environment – including the modern world with its

abundance of highly processed “foods”. Humans are true omnivores, built to enjoy a balanced diet. The foods that they each select to eat (or not eat) are often not determined by practicality, or even by conscious decision-making (Wilson, 2015). Some scientists argue that the microbes in people’s guts also play a key role in choosing what they should or should not eat (Norris et al., 2013). Whether or not those endosymbionts have a say in the diet, there remains another major determinant: Culture. Culture is the set of beliefs governing human thought, behavior, and identification that is passed down through generations. Culturally, there are many needs that must be met by the foods ingested (health needs, economic needs, social needs, the need for pleasure) (Anderson, 2005). Even when they are experiencing extreme hunger, people will not easily abandon their culturally inculcated ideas about which substances are edible or permitted to be eaten. For example, during the siege of Leningrad agronomists at Russia’s seed repository refused to eat their precious seeds. A less tragic but more dramatic example are the vegetarian contestants on the reality TV show, *Survivor*, who refuse to eat animal parts even for a million dollars.

Since food is biocultural, the nutritional anthropologists who study adaptations in foodways need to take a holistic approach. Adaptations may be genetic (over longer periods of time), physiological, or sociocultural, or any combination of the three (Young and Pelto, 2012).

The Biological Side of Food

Nutritional Science

Before discussing foodways in detail, it is important to review some nutritional science. This is the “Bio” part of the term “Bio-Cultural”, which Young and Pelto (2012) have categorized as post-consumption or post-dental. They also claim that it is significant at the level of the individual. However, nutritional science is also important in community health. Furthermore, the nutritional value of foods in most cases may be directly related to their cultural value. The

biological and the cultural aspects of foodways are firmly intertwined. For example, take Harris's (1966) discussion of India's venerated cows. Most Indians do not eat beef out of cultural considerations. Harris argues that the practice is economic as well, as milk turns out to be more valuable than beef in the long term, and cattle are also useful in agriculture for providing fertilizer and horsepower. People from India are then adapted to a traditional diet that includes dairy but excludes red meat, a biological consideration.

The nutritional value of a given food is determined by its constituent molecules. Those molecules that the human body can use throughout the course of its normal function (as energy/fuel, to build and maintain bodily structures, or in chemical reactions) are called nutrients. Some examples of nutrients are water, proteins, vitamins, and minerals. Many foods today also contain non-nutrients, which are molecules that our bodies can't use, such as colorful dyes and preservatives. The more nutrients that are packed into a food, the greater its nutritional value.

Nutrients are further classed as macro- or micro-nutrients. Water, carbohydrates, fats, and proteins are the macronutrients, needed by human bodies in large quantities. Optimal nutrition depends on a balance of carbohydrates (CHOs), lipids, and protein in the diet. The micronutrients, of which humans require only a little bit, include vitamins and minerals. Then again, some foods have an added bonus: They contain special chemicals from plants (phytochemicals) or animals (zoonutrients) that promote human health.

Water - a Macronutrient

In past nutritional science courses, water was not considered a macronutrient. Perhaps that was because it doesn't contain energy in the form of kilocalories (also known simply as "calories") as do carbohydrates, lipids, and proteins. One calorie is technically defined as the amount of heat needed to raise the temperature of 1 kilogram of water by 1°C (McGuire and Beerman, 2007). Human bodies don't exactly run on energy in the form of calories. They need

energy in the form of a molecule called Adenosine TriPhosphate, or ATP. Still, calories are a good measure of the energy stored in foods because the more calories eaten, the more ATP the body can make (McGuire and Beerman, 2007).

The majority of foods are mostly just water (raw meat is about 75% water, vegetables and fruits can be up to 95% water). In human bodies, which are also mostly water (50-65% by weight), water is necessary for biochemical reactions, regulation of body temperature, electrolyte balance, and dissolution of various substances (McGuire and Beerman, 2007). The water in foods, and their pH (which is determined by the bonds between the hydrogen and oxygen atoms in water), affect the other main types of molecules, especially carbohydrates and proteins. The pH level of foods also affects their flavor. Almost all foods (egg whites being a rare exception) are at least a little bit acidic ($\text{pH} < 7$). Even steak is slightly acidic. Acids are said to have a sour taste (think of vinegar, orange juice, and yogurt). Of course, flavors are complicated, bitter black coffee is acidic ($\text{pH} = 5.0$) and so is the sweet milk ($\text{pH} = 6.9$) people love to pour into it (McGee, 2004).

Wilson (2012:336) states that water is “the most popular beverage on the planet”. However, that fact hardly needs to be explicitly stated. Water-drinking is essential for human survival. Although there are other healthy and delicious beverage options, none of them qualifies to replace water (Wilson, 2012). Without enough water, dehydration results. Humans become dehydrated quickly, especially the very young and very old. Dehydration causes impaired memory, thinking, motor control, and attention. It makes it difficult to engage in physical activity, and it may lead to infections of the urinary tract (McGuire and Beerman, 2007). That is not to say that water-drinking is without its own problems. Much of the water on Earth is not clean enough for humans to safely drink. It could contain salts, chemical pollutants, or bellicose microbes. In the RMI, the increasing scarcity of potable water is problematic. Worldwide, bottled water is popular, and generally safe to drink. However, it leads to excessive amounts of trash, consumption of toxins such as BPA from the bottles, and large energy costs

due to shipping water from “artisanal” sources to other locations around the world. To reduce the environmental impact of water-drinking, Wilson (2012) recommends filtering tap water using a device such as a Brita filter.

Carbohydrates - Sweet Macronutrients

Carbohydrates (abbreviated as CHOs) are a large group of molecules that plants and animals use to store energy. Consuming CHOs gives human bodies about 4 calories of energy per gram (McGuire and Beerman, 2007). The simplest CHOs are sugars, and they come in many different forms. Some of the smallest sugars are monosaccharides such as glucose and fructose. Glucose is one of the most important molecules that provides energy to the cells in human bodies. Some human cells, such as brain cells, are picky eaters and will only accept glucose.

Although glucose exists in various fruits, it is always intertwined with other sugars. In fact, the most common type of sugar put out on tables in the US is sucrose, which is a notoriously delicious disaccharide (two sugar molecules linked together) composed of one molecule each of glucose and fructose. Sucrose is the second-sweetest type of sugar. Table sugar has its origin in India, where the process of extracting crystals from sugarcane was first recorded in a Sanskrit cookbook from 500 B.C. (Kim, 2013).

Fructose is one of the sweetest sugars. However, it takes more work for human bodies to break down fructose than glucose or sucrose, so eating fructose does not cause as much of a “sugar high” and is preferable for diabetics. The glycemic index quantifies the effects of a specific food on the levels of glucose in the blood. For reference, glucose has a glycemic index (GI) of 100 (McGee, 2004). The GI of a food is considered high if it is greater than or equal to 70 (e.g. Potato with GI of 85), and low if it is less than or equal to 55 (e.g. Grapes with GI of 43) (McGuire and Beerman, 2007). A food’s GI is dependent on processing and cooking

techniques, in addition to the variety of the plant and its degree of ripeness (Bahado-Singh et al., 2006).

Sugars mix well in water, which helps to give foods such as baked and frozen treats a soft and moist texture, and to fight microbial contamination (McGee, 2004). In addition, sugars participate in the Maillard reaction, in which foods turn an appealing golden - brown when cooked (Moss, 2013). Sugars are also the most stable nutrients because they don't easily break down when heated or stored for a long time like fats and proteins (McGee, 2004).

Humans have special taste receptors for sugars, which is an indication of their importance as an energy source. When these receptors sense sweetness, they send signals to the brain that cause feelings of euphoria not unlike those caused by the hard drugs cocaine (Moss, 2013) and morphine (Kenny, 2013). The parts of the brain that are called the reward centers (including the nucleus accumbens which also functions in sexual pleasure (Herz, 2018)) are aroused by signals of sweetness. The neurochemical, dopamine, which is known to stimulate addictive behaviors, is released when a person eats something specifically sweet and yummy (Kenny, 2013; Herz, 2018). There are also signals that travel in the reverse direction, from the brain to the sweet-sensing cells in the mouth, whetting the appetite (Moss, 2013). Humans even have taste receptors for sweetness in their guts (Herz, 2018). The human fondness for sugar is innate. Even newborn babies will smile when a drop of sugar water is placed on their lips. However, people may crave different amounts of sugar, depending on their age, sex, and ethnic heritage. For example, studies done in the 1970s showed that youths and Black people were found to prefer especially sweet tastes (Moss, 2013). In 1961, Barthes (2008) wrote that people in the US used almost twice as much sugar as French people (43 kg per person per year as opposed to 25 kg/person/year), going on to blame the American habit of adding sugar to all kinds of foods that the French do not, such as salads and fish.

Sugars are very concentrated sources of energy in terms of calories. Long before complicated food processing techniques were developed, carbohydrates from plants were the

main source of sweet tastes as well as the main source of energy that powered to development of human beings' relatively large brains (Herz, 2018). Unfortunately, in these days of processed plenty, some people who are fortunate enough to have a choice of foods will substitute sugary treats for foods that contain a healthier balance of nutrients. Such choices contribute to obesity, especially in “developed” countries. Americans, on average, take in about 71 lbs (32 kg) of sugar each year (sourced from cane, beets, corn, and or honeybees). In other measurements, that is about 22 teaspoons of sugar (and 355 calories) per person per day (Johnson et al., 2009). The American Heart Association recommends that people stop at somewhere between 5 and 9 teaspoons per day to preserve health (Moss, 2013). Some of the other physiological problems related to sugars are that they promote tooth decay and type II diabetes (not to mention a string of other terrible problems – from biodiversity loss to slavery - dating back centuries (Mintz, 1985)). Yet, it can be frustrating these days to monitor one's sugar consumption because sugars are found in most processed foods, and the lists of ingredients for these foods are often cryptic. Over two thirds of the sugar in the average American diet comes from processed foods (McGee, 2004). Some of the worst foods for containing excessive amounts of sugar are sweet drinks, especially soda – containing several teaspoons of sugar in each can or bottle. The average American drinks about 30 gallons of soda each year, plus additional gallons of other sweet drinks such as juice, sports drinks, and coffee drinks (Moss, 2013). Nestle (2002) notes that aside from their sugar content, sodas have no nutritional value. Essentially, they are candy in liquid form. She admits that there's nothing wrong with having candy as a treat every once in a while. However, the sheer amount of sodas consumed by Americans, especially children, and the substitution of sodas for more nutritious beverages such as juice and milk, are major factors in the increase of chronic diet-related diseases such as type II diabetes (Nestle, 2002). Soda-drinking correlates with decreased milk-drinking/lowered bone density, increased cavities, and increased weight gain in everyone (Wilson, 2012), and violence,

aggression, and decreased attention span in young people especially (Penman, 2015).

Substituting “diet” sodas is not a healthy solution (Wilson, 2012).

The sweet taste of sugar can sometimes be overpowering. Sugar has a “bliss point” at which it is present in a food at an optimal amount. Adding more sugar to food after the bliss point has been reached will cause a reaction that is the opposite of bliss. The bliss point for sugar is different depending on its presence in different foods and drinks, and for different combinations of foods (Moss, 2013).

Plants may stockpile their reserves of the simple sugar glucose by combining the relatively small glucose monosaccharides together into long, complex chains (polysaccharides) called starches. Because starch molecules are so big and dense, humans need to start digesting them right away, as soon as they enter the mouth. Saliva has a chemical in it called amylase, which breaks down starch. People have varying levels of amylase in their saliva depending on how many copies they have of the gene that makes it. Biological anthropologist Stephen Le (2016) notes that although the number of copies of the gene that makes amylase ranges between 2-13, most people have 5 copies. Starchy foods can be a problem for people who have less copies of the amylase-producing gene. Starches may be stacked together to form granules, which absorb water when cooked, causing foods such as rice and pasta to puff up and become sticky (McGee, 2004).

Not all of the complex carbohydrates made by plants are digestible by humans. Undigestible compounds such as cellulose and pectin are known as dietary fibers and while not essential to one's diet, they are considered a very healthy addition. Dietary fibers help prevent chronic diseases (like type II diabetes) and regulate bowel movements (McGuire and Beerman, 2007; Temple and Steyn, 2012).

Lipids - Smooth Macronutrients

The “fats” nutritional grouping contains not only solid fats but oils (liquid fats), waxes, cholesterol, vitamin E, and some phytochemicals such as beta-carotene, lycopene, and chlorophyll. All of these molecules are named after the Greek word for fat, lipids. Lipids impart food with pleasing flavor and texture. Some scientists have pushed for “fat” to be officially regarded as a basic taste (in the company of sweet, salty, sour, and bitter) (Running et al., 2015). However, the sense of taste doesn’t seem to include any identifiable receptors for fat in the array of human taste buds. The sensation of fat may be more of a feeling than a taste, something felt with the trigeminal nerve that connects the mouth and brain (Moss, 2013). About twice as much energy is stored in lipid molecules as in carbohydrate or protein molecules, about 9 calories per gram (McGuire and Beerman, 2007). Of course, if human bodies can’t use all that energy right away, then they convert the fat in food into body fat (Moss, 2013). Most Americans can tolerate quite high amounts of fat in their food. In fact, many seem to prefer it – especially with the addition of a little bit of sugar (Moss, 2013).

The fats and oils that occur naturally in plants and animals are triglycerides. That means they are composed of three fatty acid molecules, long chains of carbon and hydrogen atoms, linked up with a glycerol molecule. Fatty acids vary by chain length and saturation (amount of attached hydrogens). Saturated fatty acids are full of hydrogen atoms. They don’t contain any double bonds. For several years, public health guidelines have encouraged Americans to limit saturated fats (although most recently their views toward these types of fats may be changing). The most significant sources of saturated fats in the American diet are meat and cheese (Moss, 2013). Nestle (2002) claims that even though the US government thought that the saturated fats in meat and cheese were bad for people, they created programs to boost consumptions of these products because of pressures from industry lobbyists. The main reason that saturated

fats could be considered unhealthy is that they raise the body's cholesterol (Moss, 2013), which could lead to heart disease.

Monounsaturated Fatty Acids are known briefly as MUFAs. They have one double bond along their carbon chain. Polyunsaturated Fatty Acids are called PUFAs. They have more than one double bond in their carbon chain. The different fatty acids in each type of triglyceride determine the chemical and nutritional properties of that fat or oil, such as its melting temperature. Fats and oils boil at fairly high temperatures, but they may start to smoke at lower temperatures (McGee, 2004).

Although the human body can make many different types of fatty acids on its own, it is incapable of forming two very important ones, linoleic acid and linolenic acid. These are known as essential fatty acids because humans have to get them from the foods they eat. Examples of foods that are high in essential fatty acids are nuts and seeds, and their oils (McGuire and Beerman, 2007).

Trans fatty acids, aka “trans fats”, are the worst type of lipids, especially for young people. Some trans fats are naturally found in foods such as red meat and dairy, but these natural trans fats are not the problem. The main contributor to cardiovascular disease are the man-made trans fats that are found in margarine and many processed baked goods and other processed foods (McGuire and Beerman, 2007). Fast foods are the biggest sources of trans fats (Whittle et al., 2012). Trans fats are used in processed foods because they extend the food's shelf life and impart a pleasing texture – not because they have any health benefits. In fact, they have been found to increase inflammation (Le, 2016). A 2015 law ruled that all trans fats should be removed from the market by 2018 because they are not considered safe for human consumption (United States Food and Drug Administration, 2018).

Although full-fat dairy products can be problematic when not enjoyed in moderation, people should consider milk a healthy addition to their diet. Wilson (2012) writes that even if they are lactose-intolerant (lacking the body chemistry to properly digest dairy sugars, like two-

thirds of the world's population), people should try to consume some dairy products. Milk lowers blood pressure and boosts bone health, and there are lactose-free dairy products available.

Proteins - Rich Macronutrients

Like CHOs, the proteins yield roughly 4 calories of energy per gram (McGuire and Beerman, 2007). Proteins are dynamic molecules with many biochemical functions. They may be building blocks for materials such as muscle tissue in animals, enzymes that facilitate cellular reactions, or carrier molecules that move other substances around the body. Because proteins are not just energy storage molecules like lipids and carbohydrates, but active molecules, they are the least stable type of food molecules and may be easily changed, or “denatured”, by temperature, chemicals, or time. Proteins are large molecules like starches. They are composed of smaller molecules called amino acids that are chained together and sculpted into a highly specific three-dimensional configuration. There are twenty different major amino acids that human bodies use to make proteins, but luckily 11 of them can be made in house. The remaining 9 are the essential (aka indispensable) amino acids which humans must get from food. If a food contains good amounts of all 9 of the essential amino acids then it is called a complete protein source (e.g. meat, milk, fish, eggs, and soy). Foods that don't have such a good balance of essential amino acids are called incomplete protein sources. Incomplete protein sources should not be ignored though, because they can be paired with other foods that have complementary amino acid profiles to create dishes that offer complete protein (e.g. rice and beans or corn and beans) (McGuire and Beerman, 2007).

Although the flavor of food is primarily determined by fat (J. Baum, Personal Communication, 2018), amino acids also help with flavors, especially when food is cooked at high temperatures. The nonessential amino acid, glutamate, is especially important because it is responsible for the taste sensation known as umami (which means “delicious” in Japanese). In the US sometimes umami is referred to as “savory” or “brothy” (McGee, 2004:806) and often

“cheesy” (Le, 2016). Meats that have been cooked or aged have a strong umami taste (Breslin, 2013). The flavor of mushrooms is rich in umami as well.

Cooking fatty meats at high temperatures creates harmful molecules known as AGEs (not because they cause premature AGEing, which they do, but because AGE is an acronym for Advanced Glycation End products). Eating foods raw or cooking them slowly by boiling, braising, or steaming generates less AGEs. AGEs may cause problems for bones, muscles, eyes, kidneys, and the liver (Le, 2016).

Vitamins - Micronutrients

Vitamins are carbon-containing molecules that are involved in the body’s chemical reactions (Nestle, 2002). Some vitamins dissolve in water (vitamin C and the 8 B vitamins), while others dissolve in fat (vitamins A, D, E, and K). Water soluble vitamins are found naturally in many foods and added to others to create “fortified foods”. Unfortunately, these vitamins are easily degraded. Exposure to water, heat, light, high/low pH levels, and even air cause the loss of water soluble vitamins from foods. Therefore, foods containing these vitamins need to be carefully cooked and stored (McGuire and Beerman, 2007). It’s hard to overdose on water-soluble vitamins because excess amounts will just be dumped into the urine (Nestle, 2002).

Fat soluble vitamins, however, can be toxic in large amounts (McGuire and Beerman, 2007). That’s because instead of excreting excess amounts of these vitamins, the body stores them in fatty tissue (Nestle, 2002). “Many vitamins and minerals participate in energy-yielding biochemical reactions, and the phrase ‘contains vitamins essential for energy’ would accurately describe just about any food except pure sugar, starch, or alcohol (which have calories, but no nutrients) (Nestle, 2002:315).” People who market food products do take advantage of this fact.

It is essential to eat foods that contain enough of all the vitamins. Vitamin C is important for the brain, among other vital functions (Le, 2016). It is only found in plant foods (Nestle, 2002). Ancient hominids, prior to about 60 million years ago, could synthesize their own vitamin

C (Le, 2016), but modern humans have to ingest it by eating plants. Vitamin B₁₂, on the other hand, is only found in animal foods (Nestle, 2002), so vegans need to make sure they take supplements. Lack of one or more vitamins can lead to debilitating, even deadly diseases. Vitamin A deficiency is a problem in many parts of the world, including the RMI. It is a disease that is especially terrible for children.

Minerals - Micronutrients

Minerals are basic chemical elements. Plants absorb them from the soil (via symbiotic fungi called mycorrhizae), water, and air. Farmers know that good nutrition begins with good soil. Once in the body, minerals have a variety of helpful functions. Some of them can protect and repair the body's DNA (McGuire and Beerman, 2007).

There are six major minerals (aka macrominerals) essential for humans, in addition to eight trace minerals (aka microminerals, aka trace elements). The daily requirements for the major minerals are over 100 milligrams (mg) (McGuire and Beerman, 2007). These minerals are calcium, chloride, magnesium, phosphate, potassium, and sodium (Nestle, 2002). Humans require less than 100 mg per day of the trace minerals (McGuire and Beerman, 2007), chromium, cobalt, copper, fluoride, iodine, iron, manganese, molybdenum, selenium, and zinc (Nestle, 2002).

One example of a major mineral is sodium (McGuire and Beerman, 2007). Humans consume most of their sodium as table salt (a molecule made of one sodium atom and one chloride atom, and the saltiest tasting of all the salt types (Herz, 2018)). Cross-culturally, humans tend to prefer similar concentrations of salt in their diets (Breslin, 2013). However, humans are not born liking salt, as they are sugar. It takes at least 4 months for babies to hone their taste for salt (Moss, 2013). Most adults in the US are recommended to consume less than a teaspoon of salt per day (Moss, 2013). That is because sodium is linked to high blood pressure, aka hypertension. Hypertension is having a systolic blood pressure over 140 mmHg

and or a diastolic blood pressure over 90 mmHg. Sadly, the majority of the US population has hypertension. It results in more preventable deaths than any other condition except for cigarette smoking. Most hypertension-related deaths are due to cardiovascular diseases such as heart attacks and strokes (Zirakzadeh, 2012). Unfortunately, the scant teaspoon per day limit may be hard to adhere to because most processed foods contain extravagant amounts of salt – for flavor. Adding salt to foods is a cheap way to add flavor, since it is priced around 10 cents/lb. Salt is funny because human bodies can adjust to get used to eating a lot of it, and they can also get used to eating much less of it (Moss, 2013).

Iron deficiency anemia is another micronutrient related problem in both developed and developing countries (leading to more deaths in developing countries). It may result in weakness and brain fog (Wilson, 2015). Of the 2 billion iron-deficient people in the world, most are women. That is because when women start their periods, they need twice as much iron as they normally do. Then, when women get pregnant, they require twice as much iron as they did when they were menstruating (Wilson, 2015). Iron from animal sources is incorporated into the human body more efficiently than iron from plant sources (Davis and Milner, 2012).

Phytochemicals and Zoonutrients

Many plants produce “secondary compounds”, which are just any chemicals they don’t need for their basic physiological function. Plants have complex physiologies like people do. I should know, I studied plant physiology for my master’s degree. Some plant secondary compounds are toxic to humans in small amounts, such as the coniine in hemlock (*Conium maculatum*), responsible for the death of Socrates. Others are toxic only in large amounts but may actually be beneficial in small doses. An example of such an effect is the cocaine in coca leaves (*Erythroxylum* spp), which gives Andean farmers a stimulating boost (Allen, 1988) much like the caffeine from coffee (*Coffea* spp) found in Americans’ Starbucks cups.

Phytochemicals are plant secondary compounds that protect humans against diseases (Nestle, 2002). Phytochemicals are not considered nutrients, but eating them can help decrease the risk of getting cancer, heart attack, stroke, etc. (Liu, 2012). There are over 5,000 known phytochemicals. They are classified by their chemical structures. There are probably more phytochemicals that haven't been discovered yet (Liu, 2012). Examples of phytochemicals include carotenes, lycopene, and isoflavones (McGuire and Beerman, 2007; Nestle, 2002). These molecules are involved in the detoxification systems of the body (Nestle, 2002). The benefits of phytochemicals are best reaped from including whole plant foods in one's diet, as opposed to taking plant extracts in pill form (Liu, 2012). That is because whole foods are much more than the sum of their parts. The various nutrients and other molecules in foods have synergistic effects (Jacobs and Temple, 2012).

Anecdotal evidence from around the world suggests that one of the best beverage choices one can make is green tea (*Camellia sinensis*). Tea is the second most popular drink on the planet, after plain H₂O. Drinking green tea lowers the risk of cancer and cardiovascular disease. The component of green tea thought to be responsible for these benefits is the phytochemical epigallocatechin gallate (EGCG). Although green tea contains less caffeine than coffee, it boasts a similar chemical called theophylline which offers a little boost of alertness. The energy boosts from tea and coffee are much, much better for the body than "energy drinks" (e.g. Monster, Red Bull).

Eating for Good Health

According to Temple (2012b), healthcare costs in the US exceed 2 trillion dollars per year, affecting both private and public bank accounts. However, many illnesses can be prevented or ameliorated by eating a healthy diet. But what exactly are the "healthy diet" and "healthy lifestyle" that will allow people to avoid illness, live longer, and grow long, shiny hair? The modern-day gurus disagree somewhat. While journalist Michael Pollan's advice is to "Eat

food. Not too much. Mostly plants (Pollan, 2008:1).”, biological anthropologist Stephen Le points out that “...eating plants has never been conclusively shown to improve a person’s health prospects; by comparison, drinking moderate amounts of alcohol, consuming moderate amounts of salt, or being somewhat overweight have shown more tangible benefits for overall health (Le, 2016:81).” However, Le (2016) does admit there is evidence that limiting one’s protein intake may prolong her lifespan. Of course, that is only if she is eating too much protein to begin with.

Food Insecurity

Approximately one billion people on Earth are food insecure (Breslin, 2013). That means they do not have access to enough healthy foods (McGuire and Beerman, 2007). Children are especially vulnerable. Globally, the leading killers of children are malnutrition and diarrhea (Breslin, 2013). The type of malnutrition that results in the deaths of too many children is under-nutrition, in which they do not get enough of the nutrients their bodies need to function. If a person is not able to eat for 24 hours, their body enters acute starvation mode. During this time, the body slows down metabolism, breaks down stored fats, and actually suppresses hunger pangs. The body’s ability to perceive bitter tastes decreases (Herz, 2018). After 5 days without proper food intake, the body will switch to prolonged starvation mode. It starts to break down muscle and organ tissue, eventually leading to death. Even those who recover from starvation suffer residual psychological and physiological effects (McGuire and Beerman, 2007), in addition to epigenetic effects that may be passed down to subsequent generations. In the US, starvation is not common, but under-nutrition is still a challenge faced by many children in low-income environments. Some of the problems caused by under-nutrition in the US are iron-deficiency anemia and stunted growth (Nestle, 2002).

Unfortunately, food insecurity in the US is a growing problem (McGuire and Beerman, 2007). At the end of the last millennium, well over half of Americans living below the poverty

line were food insecure (Nestle, 2002). Another type of malnutrition, over-nutrition, is also quite harmful. Over-nutrition also hits much closer to home. The US has less of a problem with true hunger, or lack of food, than some other nations. In the US, food is relatively cheap given average job earnings (Le, 2016). Studies have found that most Americans eat not in response to a lack of fuel for their bodies, but as a reaction to other cues. These include motions, as well as the characteristics of crave-able foods themselves (flavor, smell, aesthetics, and mouthfeel) (Moss, 2013). Eating less food in general could benefit most Americans (along with eating more plant foods and exercising) by preventing over-nutrition (and providing phytochemicals). Yet, getting less of anything seems to go against America's national values, at least the economic ones. The industries that make crave-able, unhealthy processed foods, and those that produce fattening meat and dairy products are very powerful. Despite the science against their products, these industries have been able to influence people on both the governmental and individual levels to eat more, not less (Nestle, 2002).

Jacobs and Temple (2012) have defined the "Western Dietary Pattern" as the overconsumption of red meats, processed meats, refined cereals, French fries, and desserts. Such a diet raises the risk of developing – and consequently dying from – any of the chronic diseases. Produce, the foundation of healthy eating (and environmental sustainability), can be expensive. Instead of aiding fruit and vegetable farmers as Martin et al. (2013) recommend, the US government subsidizes less healthy foods that are backed by greater political power, such as cheese (Nestle, 2002). However, if one takes into account not the energy (calorie) content of the food but its weight, then nutrient-dense items such as broccoli are actually cheaper per pound of food than fatty, sugary items such as store-bought cookies (Moss, 2013).

Similar to food security is the idea of food sovereignty, or the power of people to access enough of their own culturally important foods (Nolan and Pieroni, 2014). Food sovereignty ties into indigenous rights to natural resources, as well to the mental health of migrants living in a new environment, and to those of anyone living in a very urbanized environment.

Obesity

Body fat has some health benefits. Fat provides a buffer against the wasting symptoms of some chronic diseases and provides a place to filter and store excess toxins in the body. However, obesity, defined by McGuire and Beerman (2007:G-9) as simply “excess body fat” , has been called an epidemic in the US and the world (Martin et al., 2013). For practical reasons, anyone with a Body Mass Index (BMI) greater than 30 is considered obese. BMI is calculated by dividing one’s weight (in kilograms) by the square of her height (in meters). Over the past three decades, adult obesity has increased almost everywhere, but it is still highest in the US (Whittle et al., 2012). Obesity related diseases include not only type II diabetes and cardiovascular disease but also colon cancer, gout (crystals of uric acid accumulate in the joints), gallbladder disease, and osteoarthritis (bones grind together) (McGuire and Beerman, 2007).

Both genetics and lifestyle (e.g. junk food, exercise, cultural norms) determine obesity (McGuire and Beerman, 2007). The condition is not the result of a lack of willpower. It may sometimes be caused by a hormonal imbalance, but not always. Recent research on hunger-satiety signals in brain chemistry has shown that obesity may be related to a kind of “addiction” to the “wrong” kinds of foods (Kenny, 2013). Breslin (2013) refers to the “wrong” foods, processed foods packed with salt, sugar, fat, and glutamate, as “super stimuli” because they provide much too much of a good thing (that thing being calories). Moss (2013) calls the high calorie junk foods “engineered foods”. He compares them to hard drugs because they are unhealthy and seemingly addictive. Surprisingly, drinking alcohol has not been shown to correlate with obesity, despite what the term “beer belly” might insinuate (Temple, 2012).

Nutritional scientists disagree on whether obesity is caused by a true addiction to processed foods. Kenny (2013) points out that the only reason it would matter is if doctors were able to treat obesity with the same medications and therapies they would use to treat any other

addiction. It is obviously a complicated situation because people have a biological need for calories: Does that mean that humans are all addicted to food? The foods that are especially addictive contain a complex mixture of salt, sugar, and fat, unlike drugs that contain a single addictive chemical compound like nicotine or cocaine. Certainly the processed foods that are capable of causing obesity are different from the “whole” foods that biological systems evolved feedback mechanisms to absorb (Kenny, 2013). Finally, Herz (2018) notes that obesity in itself is not a fatal diagnosis. The human body is capable of readjusting to function at a higher weight, to the extent permitted by one’s unique genetics and lifestyle.

In developed countries, many pets also suffer from obesity (Moss, 2013). In contrast, studies have shown that animals who eat less food end up living longer, more healthy lives (as long as the food that they do consume is very nutritious). There’s even an acronym for this type of diet, CRON, which stands for Caloric Restriction with Optimal Nutrition. Of course one has to wonder if the CRON diet would work as well for humans as for lab rats. However, human trials have been deemed unethical (McGuire and Beerman, 2007). Sometimes when animals are put on a CRON diet they suffer from infertility, impeded growth, infections, and sensitivity to cold (Le, 2016).

Diabetes

The cells that make up human bodies like to use glucose for fuel. Glucose travels to all of the different cells through the bloodstream. However, too much glucose in the blood is bad for people’s kidneys, eyes, circulation, and nerves. The natural system that human bodies use to regulate blood glucose levels involves the hormone, insulin. In the case of diabetes (aka hyperglycemia), the body does not have enough insulin to deal with all the sugar in the blood (McGee, 2004). Before the discovery of insulin in the last century, diabetes was a deadly diagnosis (McGuire and Beerman, 2007). Even today, diabetics must be careful to limit their intake of sweets (McGee, 2004). Having diabetes increases the risk of heart attack, stroke, and

kidney failure. It can easily take ten years off one's estimated lifespan (Temple and Steyn, 2012). There are several forms of diabetes, depending on the genetics and lifestyle of the patient. However, the version of the disease that is most responsive to diet and exercise is called type II diabetes (aka non-insulin-dependent diabetes mellitus, NIDDM, or adult-onset diabetes). It's the most common diabetes in the world and it's on the rise, although as many as half of type II diabetes cases go undiagnosed (Temple and Steyn, 2012). Most diabetic Americans have type II diabetes (McGuire and Beerman, 2007). One in three kids born in the US in the year 2000 are expected to develop diabetes (Temple and Steyn, 2012). Dietary recommendations for diabetes prevention and control include increasing exercise, whole grains, magnesium, PUFAs, green leafy vegetables, and nuts. One should also simultaneously attempt to decrease SFAs, sodas, processed meats, and alcohol (Temple and Steyn, 2012).

Type II diabetes is an important health issue facing many communities. Far from being an exception, the Marshallese community in Springdale has a relatively high incidence of the disease. In fact, McGuire and Beerman (2007:164, Table 2) list "Being of African, Hispanic, Native American, or *Pacific Island* [emphasis mine] descent" as one of the "Risk Factors Associated with Type 2 Diabetes". Forty percent of adults in the Micronesian island country of Nauru have type 2 diabetes, making them the second highest affected population in the world (after the Pima of the US) (Temple and Steyn, 2012).

Cardiovascular Disease

The term cardiovascular disease (CVD) encompasses many different conditions that threaten blood flow, including heart disease (impaired blood flow to the heart) and stroke (impaired blood flow to the brain). Heart disease is the number one cause of mortality in the US. While some of the risk factors for CVD are genetic (ex. gender, ethnicity), others are more controllable. Some easier-said-than-done tips for decreasing the chance of getting CVD include quitting smoking, drinking in moderation, and reducing stress. Then of course, there is the issue

of diet. Both obesity and diabetes are risk factors for CVD, as well as high blood pressure (typically caused by excess salt) and high blood lipids (typically caused by excess meat and dairy, and inadequate fiber). Certain diets, such as the Mediterranean style of eating, are correlated with a lower incidence of CVD (McGuire and Beerman, 2007).

Cancer

The US has a very high incidence of cancer. Fortunately, the risk of developing cancer can be lowered by eating right, exercising, and practicing healthy habits (Davis and Milner, 2012). Approximately a third of US cancer cases are caused by poor dietary practices. Eating too much fat and processed meats will increase a person's cancer risk, as will drinking too much alcohol (McGuire and Beerman, 2007; Davis and Milner, 2012). However, eating certain healthy fats (e.g. olive oil), fiber, and plenty of micronutrients (especially selenium and folate) and phytochemicals (from fruits and vegetables) will decrease the risk, as will getting regular exercise (McGuire and Beerman, 2007; Davis and Milner, 2012).

Sometimes the foods that people choose to eat, or the ways in which they prepare them, have carcinogenic (cancer-causing) effects. The blame isn't wholly due to the fairly new introduction of radiation or pesticide contamination to the global food supply. Things that humans have been doing for thousands of years, like drinking alcohol and burning meat, introduce the body to cancer-causing substances. When meat is burned, harmful molecules called polycyclic aromatic hydrocarbons (PAHs) and heterocyclic amines (HCAs) are created (Davis and Milner, 2012).

Tasting

Taste is one of the primary human senses, along with sight, hearing, smell, and touch. However, it is difficult to study because it lies inside the body. Therefore, taste may be the least understood of these senses. The purpose of the ability to taste dates back 7 – 8 million years

ago, when omnivorous hominids living in the forest primeval relied on taste to distinguish the foods that would best meet their nutritional needs from those that were suboptimal or worse, poisonous (Breslin, 2013). The taste of an edible also helps prime the human body to digest it. Some other species can also use their sense of taste to receive social cues. For example, male fruit flies can taste whether a potential partner is male or female (Breslin, 2013). Thankfully, humans don't seem to do that, although Breslin (2013) points out that this topic has yet to be fully studied (certain activities such as "French" kissing do involve humans tasting each other).

Some of the evidence supporting the importance of taste is that it's uncommon to meet someone who can't taste at all, and damaged taste organs will regrow (at least to a greater extent than other damaged organs) (Breslin, 2013). Omnivores have more taste receptors than generalists (e.g. koalas, pandas) or strict carnivores (e.g. lions) (Breslin, 2013). Human taste receptors are bundled into 10,000 or so "buds" (Moss, 2013).

The main organ of taste is the tongue (humans also use the soft palate – the top of the mouth, and the pharynx). However, the tongue map I was taught in elementary school is bogus (Moss, 2013). The four basic tastes, sweet, salty, sour, and bitter, can be sensed all over the human tongue, with the exception of the center line (Herz, 2018), although the original research from 1901 that gave rise to the myth of the tongue map showed that perhaps the tip of the tongue can taste sweetness especially intensely. Humans have an array of sensory cells that extends from the tongue all the way to the gut. Children sometimes have more taste cells than adults (Breslin, 2013). Even though the tastes are not bounded into certain regions of the tongue like the counties of a state, they are compartmentalized by the brain (Herz, 2018).

Humans are best equipped to detect bitter tastes, which often signal toxic substances. Humans generally disdain things that taste truly bitter. Reactions to strong bitter tastes may include gagging, nausea, and vomiting. Young children, with their extra abilities to taste, are especially averse to bitter foods such as broccoli and kale (*Brassica oleracea*). It is much easier to coax them to eat carrots, peas, yams, and other produce that tends to taste sweet. Yet taste

is complicated and there are many interactions that can occur between the basic tastes. For example, sweet sugar can mask the bitter flavors in coffee, tea, and cocoa (*Theobroma cacao*).

There has been a great deal of conversation in sensory science circles about the basic tastes, mainly arguments about whether there are truly just the four. In addition to the physiological reactions caused by sweet, salty, sour, and bitter tastes, humans have specialized responses to four other types of tastes: Umami, Spicy, Fat, and Calcium. People also respond to a broad range of other oral sensations including electric, soapy, and metallic (Herz, 2018).

The human perception of the various tastes, both the basic and the controversial ones, has been shown to be affected by other senses and experiences, and vice versa. For example, Herz (2018) reports that tasting sweetness can positively influence people's moods and their levels of generosity – to the point of suppressing the pain response. And then on the flip side, people's moods affect their ability to register the intensity of sweetness or sourness of foods and or drinks. The tastes of foods are also culturally influenced by their colors, shapes, and textures, by sounds in the dining environment, and even by the language used to describe their flavors, preparation, and ingredients.

Altogether, the various tastes that are triggered by a certain food, along with the smell of the food, and how it feels in the mouth make up the food's flavor (Breslin, 2013). The way that flavors are perceived is more complicated than the way that tastes are perceived. The human sense of taste develops in the womb and remains fairly stable through the lifetime, but the enjoyment of different flavors must evolve from experience – and will constantly grow and change with each life experience (Wilson, 2015). Stronger flavors (Moss uses turkey tetrazzini as an example) send stronger sensory signals to the brain. When confronted with these strong signals, the brain quickly registers the feeling of having eaten enough, or satiety. On the other hand, humans can eat plenty of uninspired foods such as white rice without feeling filled up, because bland and balanced flavors don't overwhelm the senses. The term for this strange phenomenon is "sensory – specific satiety" and some of the most popular processed foods in

the US (e.g. Velveeta cheese, Coca-Cola) take advantage of it. Sensory – specific satiety may have evolved as an omnivorous adaptation to help motivate early humans to eat a varied diet (Moss, 2013).

Another weird and relevant characteristic of taste and flavor is that responses to them can change. Food aversions commonly occur when the ingestion of a specific food flavor co-occurs with a bout of nausea. On the other hand, humans can learn to enjoy even very bitter substances such as coffee and wine when they begin to appreciate rewarding stimuli such as alertness and “buzz”. Through experience, humans also learn about the “correct” flavors that foods are supposed to have, as well as how they are supposed to smell. Pregnancy is one factor that can cause a person’s taste, flavor, and smell responses to change. During pregnancy, women may experience a lot of nausea, especially in response to bitter tastes. Studies have shown that this helps them avoid substances that might potentially harm the fetus, so they have a higher chance of birthing healthier babies (Breslin, 2013).

The sense of smell is inextricably linked to that of taste, and to the perception of flavor. Heat increases the aromas of foods and beverages, and therefore enhances their flavors. It especially boosts the sweet taste. Smelling foods also whets the appetite (Herz, 2018).

Disgust

Disgust is a negative biocultural response characterized by a specific facial expression (narrow nostrils) and a physiological reaction including increased saliva and tightened throat (Jones, 2000). From a biological standpoint, disgust is strongly linked to bitter tastes. Indeed, people intrinsically make the same expression of disgust in response to tasting something surprisingly bitter (Herz, 2018). On the cultural side, waste, especially feces, and primarily the feces of strangers, is generally considered the most disgusting substance, followed by various other animal products, and finally by rotten, slimy, or smelly plants (Jones, 2000). The purpose of disgust may be to help people avoid things that might make them sick. However, that simple

explanation doesn't go far in explaining why it is that some people are so disgusted by the prospect of eating invertebrates that they would rather starve, or conversely, why some people are so fond of moldy blue cheese or Faroese *raestur fiskur* (air-dried fermented fish) (Svanberg, 2015). Freud might be interested in explaining the correlation of disgust to potty training. Some people will point out members of other groups for engaging in behavior they themselves deem too disgusting. This attitude of superiority points to distinction as a reason for disgust. However, other people like to challenge themselves and others within their own group, for various reasons, by doing disgusting things like eating worms or working closely with sick people (Jones, 2000).

The Future of Food Science

Learning what to eat and when to eat it is the key to solving the omnivore's dilemma. However, the pace of nutritional breakthroughs has slowed since the discovery of vitamins. Human bodies and food are both biochemically complex, funding for scientific research is limited, and the types of research experiments that scientists are allowed to perform on other humans are tightly controlled.

A major development in the 1990s in agricultural science and food production was the creation of Genetically Modified Organisms (GMOs). GMOs are plants (mostly) that have been altered by novel laboratory methods to contain genes from other species (not necessarily other species of plants). One example of a GMO is "Golden Rice". In contrast to normal white rice, a variety of *Oryza sativa* was genetically altered with a gene that allows it to manufacture its own beta-carotene (a pre-vitamin A molecule). Vitamin A deficiency and rice eating cultures overlap in many places, making Golden Rice a potential life saver. Unfortunately, GMO technology never achieved the positive reception from farmers and consumers that it enjoyed in the scientific community – although Americans now consume GMOs (not Golden Rice) daily in

sodas, cereals, and so on. The scientific community is working to dispel the fears that many consumers have about the health and ecological impacts of GMOs.

The Cultural Side of Food

The cultural aspects of foodways are important during what Young and Pelto (2012) designate as the “pre-dental” stage, when people engage in food choice behavior (the part of eating that takes place before they swallow). Such behavior is especially significant at the community level, at least as far as anthropologists are concerned. Of course, it is also important at the level of the individual for the purposes of identity construction.

A Brief History of Anthropological Food Studies

Mintz (2002) explains how foodways may have been taken for granted by early anthropologists. For much of Anthropology’s youth, which was dominated by European male thinkers, food studies were overlooked (or actively denigrated) because of food’s association with women’s work and boring daily life. However, Sutton (2001) argues that some food-related details that might seem unimportant to Euro-Americans could carry more meaning in other cultures, stressing the importance of repetition of details to memory. Belasco (2002) offers another possible explanation for the past disregard for foodways as a field of study by American academics: The influence of Protestantism. The Western idea that humans are separate from nature actually began with Aristotle (384-322 BC). It gained religious justification – recall Adam and Eve getting booted from the garden – and continues to challenge environmentalists to this day.

Fortunately, as the centuries passed, anthropological interest in food and foodways began to grow among anthropologists (such as the late nineteenth century’s Franz Boas, who wrote about salmon-eating among the indigenous peoples of the Pacific Northwest) and mainstream publications (such as the journal, *American Anthropologist*) (Mintz and Du Bois,

2002). The anthropology of food gained momentum in the mid-1960s with important works by the Structuralists, Lévi-Strauss and Barthes (Frenchmen stereotypically preoccupied with food), Douglas, and others. Anthropological food studies have expanded exponentially since the 1980s. It appears that contemporary anthropology is engaged in a love affair with food. The concept of food as a proxy for culture has been well-established in the literature. However, there is still room for further anthropological work using food as a foundation (Williams-Forson, 2011). Humphrey (1989) reminds us that traditional foods can illustrate the important values of a person or ethnic group. Some of the major issues that people face today are directly related to food such as hunger and chronic diseases. Other issues relate less directly to food but may be illuminated by an understanding of the domain, such as globalization. And as Mintz and Du Bois (2002) suggest, food studies are useful in testing anthropological methods and theories. This study of Marshallese foodways and culture in Springdale represents, in part, one such test, as I use subject foodways research to cognitive anthropology methods.

Food studies are not limited to anthropology. History, sociology, psychology, and many other disciplines are equally engaged in this delicious subject. Furrow (2016) sees the relatively recent academic interest in food as a counter-revolution. The special emphasis on food's quality, flavor, community, symbolism, and *terroir* directly oppose what he refers to as the "production paradigm", the tendency of American society to value efficiency, growth, production, and consumption. One of today's major trends in anthropology is multi-species ethnography, as championed by the British anthropologist Timothy Ingold. It takes a post-modernist approach in studying humans as symbiotic with the world around them. An example of the multispecies way of viewing the world would be a human individual – plus her billions of attending gut microbes. Another example would be including herders along with the animals in their flock.

Food and Identity

Barthes (2008) wrote that all foods are signs, ripe with meaning. In the current era of shifting populations, the symbolism of unique foodways are especially important to identity (Vu and Voeks, 2012). In public, people are constantly performing their identity for others (perhaps even for themselves). Eating the traditional foods of one's culture communicates that one belongs to that particular group. The action of eating, repeated daily (ideally three times per day), is the continual performance of identity (Prosterman, 1984). Of course, people can belong to multiple groups at the same time, with each of their groupings influencing their diet (Goode et al., 1984). For example, people belong to different age groups, regional groups, ethnic groups, genders, and tax brackets.

If our identities are to be defined by our diets, they must necessarily be fluid. That is because we are all omnivores. We eat according to our biological needs, emotional desires, and the availability of various foodstuffs in our physical environments. To exemplify this point, Furrow (2016) lists the different types of vegetarians: those who eat no meat at all, those who eat no dairy nor eggs nor meat, those who eat seafood, those who occasionally eat meat, and those who (like me) were vegetarians once but have since reformed. Just because identity is fluid however, does not mean it is unimportant. According to Furrow, identity becomes most important when it is challenged. Kalčík (1984) mentions one of the challenges to identity, the pressure to assimilate, or change, to fit into a new dominant culture.

Belasco (2005:219-220) defines the term "cuisine" as "a set of socially situated food behaviors with these components: a limited number of "edible" foods (*selectivity*); a preference for particular ways of preparing food (*technique*); a distinctive set of flavor, textural, and visual characteristics (*aesthetics*); a set of rules for consuming food (*ritual*); and an organized system of producing and distributing the food (*infrastructure*).” He goes on to include one more buzzword, "*ideology*", to explain the symbolism that all of the other components share.

National cuisines may be constructs invented and espoused by organizations that directly benefit from them (Belasco, 2002). They aren't necessarily germane to most people's

day-to-day existence. Wilk (2002:70) notes that among other environmental differences in foodways, "national" cuisine is part of the public domain. He refers to its nuclear-family equivalent as "regional" cuisine. Whereas the former is a product of "modern artifice", the latter comes from "ancient tradition". The idea that a certain food (or donut shop chain) becomes a part of "national cuisine" in the same way that folklore precludes fact is echoed by Penfold (2002) in his essay on *Tim Horton's* (the Canadian equivalent of *Krispy Kreme*). So, traditional foods don't have to have a long history of being eaten by a specific group to become a key aspect of group identity. Some examples of more recently established traditional foods are King's Hawaiian rolls in Hawaii and fry bread in many Native American communities (Raspa, 1984). Even though these foods are relatively unhealthy, they are considered cultural markers, and as such, group members are loathe to give them up.

The "national cuisine" is actually a relatively new idea, driven by globalization, even though it may claim a relationship to *terroir* or tradition. The former is a word that suggests not only the physical qualities of a place (climatic, topographic, and edaphic factors) which can be studied scientifically but also the metaphysical, the soul of a food's producer (Guy, 2002). *Terroir* practically defies direct English translation. Although the concept originated in France to describe wine and cheese, it has spread around the world and been used to describe many different products (ex. chocolate, maple syrup) as foodways have become more globalized. *Terroir* encompasses the idea of food culture. A California fruit farmer defined *terroir* for Trubek (2008:123) as "40 percent climate, 40 percent soil, and 20 percent cultural. Despite the popularity of farmer's markets and the emergence of the Slow Food movement, Trubek (2008) notes that these days *terroir* may be difficult to embrace, partly because just five supermarket chains, including the Arkansas-based Walmart, have rapidly become responsible for nearly 50 percent of all retail food sales in the US. That kind of food distribution system doesn't do much to promote variety, especially when it comes to fresh fruits and vegetables. American consumers are used to thinking of foods as commodities. Since most of the food in the US

comes from far-away places, via large supermarkets, the term “local food” takes on new meaning. Vermont restaurant owner Tod Murphy told Trubek (2008:208) “Food is local as long as it is knowable.” Knowledge of food means spreading source information so that distant people who may consume the food have more than abstract ideas about it.

A national cuisine may arise within a country where it is spurred by cookbooks, government nutritional policies, or local politics (Wilk, 2002:80). In some cases, however, the national cuisine is formed or popularized more through expatriation (Wilk, 2002).

Eating the Other

The US is a country with an overwhelming variety of people eating different types of food. It sometimes seems as if the US has no national cuisine of its own, unless one counts that of the dominant ethnic group (Euro-Americans). This group has heavily influenced American cooking in general, as Barthes (2008) notes it must have been the first Dutch and German immigrants who instigated the national craving for sweet and salty foods.

Cultural differences in cuisine are easy to spot. Flavor principles are one way to determine to which ethnic category a specific dish belongs. Flavor principles are ingredient combinations that equate to the flavor of a given geographic region. For example, a flavor principle for Russian food might be sour cream + dill + onion + parsley (Kittler et al., 2012), a formula used throughout the country to masterfully elevate potatoes, beets, and fish. Harbottle (2000) notes that there may be more than one distinct flavor principle within a given cuisine, and even more variances may be contained within each flavor principle due to regionality.

Key ingredients also may determine the provenance of a dish or cuisine. For example, Americans avoid eating eels because they resemble snakes. However, some groups of people in other countries, and even some immigrants in the US such as Italians, enjoy eating eels. Apparently they are quite delicious when portioned, breaded, and pan fried in a cast iron vessel (Gillespie, 1984). Then again, what food isn't delicious when fried? To many long-time

residents, the food of immigrants has historically been viewed as untrustworthy at best and contaminated at worse (Rohrleitner, 2016). The most poignant example of the latter was Mary Mallon, aka “Typhoid Mary”, an Irish immigrant to the US who poisoned several of those who employed her as a cook. Vu and Voeks (2012:36) remind us of the geographical associations between some groups of people and specific foods with their examples of the sometimes derogatory terms for the Irish “potato people” and Sicilian “macaroni eaters”.

Today, concepts such as *terroir* may be beneficial in attracting culinary tourists. Culinary tourism is the experience of eating something perceived as new. Sometimes the new food is the main reason for the implied travel event (not necessarily a physical form of travel). Other times the new food serves as a window into another culture, or a Long (2004) explains, a vehicle for transporting a person from one place, or group, to another. The transportation, or transformation offered by the food of others has been cited as a source of power by Humphrey (1989) and Ferrero (2002). Eating the food of another culture has the power to broaden one’s mind, elevate one’s health, and alter one’s identity. Sharing food with someone from another culture has the power to bring people (and flavors) together.

Marketing Food

Different brands or variations of similar – or even of identical – products may be appealing to people who are either familiar with or curious about a certain type of food. Therefore, buying a specific brand somehow deemed “authentic” can be a way of incorporating the qualities of another culture into one’s own life – what foodways anthropologists refer to as “eating the other”. Likewise, eating certain products can be a way of asserting one’s own cultural savvy. Or buying a certain brand can communicate status, add imagined value to a product, and connect immigrants with memories from their home countries. Here in Arkansas, the largest producer of rice in the US, I can go to the local grocery store (operated by Walmart, of course) and buy RiceLand brand rice grown in the Southern part of the state. The very same

grocery store sells other brands of rice that are imported from Asia. Bags of Asian rice, however, are found in a special section along with soy sauces, tins of water chestnuts, and “baby corn”. Furthermore, if I’m going to buy and eat rice like a real Asian person, I can go to a specialty grocer in Springdale and get a 50-pound sack of Taiwan’s most popular brand of rice.

Hungry and Full

Hunger is basically just the body’s need for food. Signals of hunger come from the brain, stomach, pancreas, and fat. Appetite however, is all psychological. Therefore, appetite may be partly culturally conditioned. Appetite refers to a general desire for sustenance. However, when a very specific food item is desired, appetite becomes craving (McGuire and Beerman, 2007). Satiation, the signals to stop eating, and satiety, the feeling of fullness after a meal, may be partly culturally conditioned as well. For many peoples' meals, the keystone ingredient is a starchy base such as rice (D. Chen, Personal Communication) or bread (Harbottle, 2000:43). In the absence of their key starch, a person may not achieve the feeling of satiety, even though their nutritional needs have been met. Familiarity, not just with the food item but with the context in which it is consumed, is a factor in feeling full. Additional factors related to satiety are the length of time the food remains in the mouth, and being mindful when eating, paying proper attention to the experience of eating (Herz, 2018).

Signals associated with feeling hungry or satiated are not linked to the experience of thirst. That’s why sodas and other high-calorie beverages are so dangerous (Popkin, 2012). To quench thirst, a person may drink a soda. The calories in the soda are about the same as from eating a snack, but they don’t register in human brains or stomachs that way. Therefore, when drinking sodas, people are more likely to consume more calories than they actually need (Bray et al. 2004).

How to Study Foodways

Though they are complex, foodways are relatively easy to study because everyone has to eat, and they usually follow obvious patterns of eating (Anderson, 2005). Several different approaches have been successfully used to study foodways, including structuralism and functionalism (Mintz, 2002). However, the field is not without its challenges, especially in the US where many different ethnic groups intersect with just as many different socioeconomic groups, age groups, trends, and natural habitats, as well as millions of uniquely personal preferences (Goode et al., 1984). Taste has not been well-covered in the anthropological literature. Sutton (2001) notes that the range of taste and smell categories is limited compared to the domains of other senses, such as color terms. The latter have been shown to be culturally determined. Perhaps tastes are culturally determined as well. Yet, everyone tastes and smells in their own unique way, undergoing private experiences. Thus, a movie theater may be filled with a hundred people all seeing and hearing roughly the same dramatic scene. However, a popcorn-munching movie-goer is lost in a crisp, buttery world all to himself. And he is left with few words to describe the taste experience to his date, or anyone else. Sutton (2001) suggests that our lack of ability to compare our taste experiences is what drives us to keep searching for new products and flavors. Harbottle (2000) makes the point that food studies must be holistic in nature, as each food and each diner are subject to myriad internal and external forces.

The Levels of Foodways Analysis

One issue that arises in foodways studies is the distinction between foods comprised of a singular edible item versus a mixture of such items in recipe-specified proportions, and more encompassing levels of study (Goode et al., 1984). Food items may hold much symbolism (Gutierrez, 1984). Clearly, *mā*, or breadfruit (*Artocarpus altilis*) is a staple Marshallese food. *Raij*, rice, appears to have been incorporated into the core of the domain as well. To point out

that many non-Marshallese people also eat large amounts of rice would be a huge understatement. Thus, there may be problems in comparing the foodways of different groups based on individual ingredients, in addition to the fact that items lists are often dynamic. For example, a century ago Marshallese people did not eat rice. Another issue with single ingredients is that they may hold additional symbolic meaning - aside from their food symbolism - as naturally or locally available resources. For example, Gutierrez (1984) explains how for Cajun people, the crawfish is both a symbolic animal and a symbolic food. This intertwining of symbolic functions should be especially complicated for Marshallese plants and animals because they all have multiple functions in the resource-limited environment of the Islands. Some examples are the breadfruit, which is both a food and a source of boat-making wood, and the coconut (*Cocos nucifera*), *ni*, which is a beverage and a sugar source, but also used for medicine, materials, and as the RMI's only cash crop.

Cooking practices have also been used to define the foodways of some ethnic groups. Humphrey (1989) noticed some traditional techniques used to gauge the amounts of ingredients and the progress of the cooking in recipes that she collected from her students. Such practices might allow researchers some insights into culture because of their transformative power. For example, Gutierrez's (1984) crawfish transitions between its symbolism as an animal and its symbolism as a food once it is boiled alive. In urban US grocery stores, the natural symbolism of many products is cooked, pasteurized, bottled, frozen, packaged, and otherwise very well hidden by their symbolism as foods (Raspa, 1984). Goode et al. (1984) also point out that preparation methods, like individual food items, may generate false assumptions and provide a weak basis for comparisons.

The recipe level often represents the foodways of a specific ethnic group better than the single food item level (Goode et al., 1984). Recipes are most often passed down from generation to generation (through the females in the family) as opposed to sharing among peers (Humphrey, 1989), so they may reveal patterns of knowledge transmission. Although recipes

tend to vary greatly within a group (each and every grandmother has her own special recipe for each dish), they are more complex than single food items and thus offer the inquiring mind more substantial territory to explore. Recipes show how individual items are related. For example, in the Marshall Islands, recipes for *jokkwōp* (a stew) may combine both breadfruit and rice with coconut cream.

Even more complex than recipes are meals (how food items and dishes are put together) and meal cycles (how different meals are enjoyed over a given period such as a week, a year, or a whole lifetime). Like recipes, meals can reveal the relationships between different foods. They may also emphasize food hierarchies. However, it is the meal cycle, the broadest and most complicated level of foodways study, that offers the most information to unpack. The patterns of meal cycles may harbor the most traditional aspects of the foodways being observed, even into the third generation (Goode et al., 1984).

“Food narratives” are the ways in which people use food in their everyday lives. They may be very useful in studying the foodways of a given cultural group. Likewise, “foodscapes”, following Appadurai's 1990 theory of shifting cultural dimensions (scapes), may also be useful in tracking changes in ethnic foodways. Ferrero (2002) designates the foodscape as the movements of various foods around the world. Foodscapes include cookbooks and recipes.

Food and Gender

In many cultures, men and women are expected to prefer, or even to exclusively eat, different foods. Milk is typically considered a female food while meat, especially red meat cooked using fire or coals, is typically considered a male food. On American TV, advertisements for “diet” foods such as salad and yogurt often depict bubbly young women or handsome young men. That is to say, they are unapologetically targeted at women. Unfortunately, so are ads for “indulgent” foods such as chocolate and creamers. “Lite” foods and drinks that might interest men are marketed with commercials featuring hyper-masculine

tropes such as marathoners (Michelob Ultra) and mountain men (Dr. Pepper 10). The psychologist who came up with this marketing strategy was Ernest Dichter, a friend of Sigmund Freud (Moss, 2013).

There are physiological differences between females and males that help contribute to the stereotypes about which foods they should eat. Starting from at least seven years old, it is recommended that boys consume more calories than girls, even if the children are of similar size and activity level (Wilson, 2015). Still, both men and women need to eat a balanced diet. Meat (especially liver and steak), which is considered masculine, is an excellent source of iron for women (Wilson, 2015).

Of course, in most cultures, women have a very special relationship with food that goes beyond personal enjoyment. Their positions within the family as wives, mothers, and grandmothers may be defined by culinary tasks. Since women typically do the cooking (and perhaps even the majority of the grocery shopping, gardening, and so on), the power to choose the family's daily menu may primarily reside within them. Food giving is one way that women almost universally are able to gain social power (Harbottle, 2000). Williams (1984) offers a prime example of how this works, via *tamales*, in the communities of Mexican migrant workers in Texas and Illinois. While the world's women do most of the day-to-day cooking, many cultures allow men to show off their culinary skills at special events such as barbeques and crawfish boils (Gutierrez, 1984).

Women are often poetically depicted as or compared to food, especially to fruit (Cruz, 2016). Gendered differences in foodways may indeed cause certain foods to be sexualized, as seen in the media. The worst offenders in this case must certainly be those ads for "indulgent" chocolate.

Food and Memory

When Sutton wrote his book on food and memory in 2001, there were few other studies on the subject. Yet it makes sense both scientifically and anecdotally that food and memory are intertwined. The prefrontal cortex, the part of the brain that stores information about flavors, is also involved in memory function (Wilson, 2015). The sense of smell is especially evocative of memories, emotions, and motivations (Herz, 2018).

Sharing traditional foods reinforces the common past of people within a cultural group (Wilson, 2015). Memory provides a sense of continuity to migrants (Espín, 2015). Yet memories are subject to distortion, omission, and revision (especially recent memories). They are shaped by environmental, cultural, and other factors. Often, memories are not always of what was but of what a person may wish had happened, as positive memories endure more strongly than negative ones (Walker et al., 1997).

Food associations develop very early in life, perhaps in the womb. Strong flavors, such as that of garlic, have been detected in amniotic fluid (Wilson, 2015). During breastfeeding food becomes not just nutrition but warmth, sensation, closeness, and care (Harbottle, 2000). As children, humans are capable of forming strong emotional bonds to all kinds of foods, not just to sweets. Yet most processed baby foods are made extra sweet in order to appeal to adult sensibilities, since many adults now associate their happy childhood memories with junk foods (Wilson, 2015) (funnel cakes at the carnival, popcorn at the ballgame). Emotional memories are more likely to be accurate (Espín, 2015).

Mankekar (2005) notes that certain brands of food or other products from the home country can evoke powerful feelings of nostalgia in immigrants. Herz (2018:244) defines nostalgia as “a sentimental yearning and wistful affection for one’s past”, adding that it “typically involves memories of special occasions and meaningful personal connections with others.” In Harbottle's (2000) book about Iranian foodways in Britain, she did indeed find that traditional

foods triggered nostalgic memories in her respondents. Often the recollection of a certain dish is tied to memories of the chef who made it (Wilson, 2015). That explains why, even with the same recipes, it's so difficult to prepare food "just like mother used to make". The problem is not the recipe nor the preparation, it is the absence of "mother", a key ingredient of the food memory. Sweets are especially powerful reminders of the past. Miller (2013:240) notes that of all the Soul Food dishes, desserts brought out "the deepest sighs and the most wistful looks off into the distance" of his respondents. When folklorist Lin Humphrey (1989) collected traditional recipes from her students, she noticed that the majority were for desserts. Food memories serve to transmit culture from generation to generation. People get used to eating the foods of their childhood and tend to crave them later in life. So, as each generation satisfies their cravings – and shares the food with their children – ethnic foodways are perpetuated. Foods that remind people of their childhood, home, and family are often referred to as "comfort foods" (Herz, 2018:235). These foods cause an increase in the feel-good hormones, endorphins, in people who eat them. Herz also links comfort foods to physical sensations, known as "embodied cognitions". For example, eating warmed comfort food can feel like being physically comforted by a loving embrace. But everyone will experience every food differently based on their unique childhood experiences, interpretation of cultural cues, and physical factors such as stress level.

Food and Reciprocity

There are many types of material and non-material things that people can share, including childcare and other jobs, money, rituals, entertainment, knowledge, females (in some cultures), and food. Every gift is imbued with a sort of "spirit" (Mauss, 1967), however food seems to be especially powerful. "The sharing of food has always been part of the human story," begins a photo essay in a recent issue of *National Geographic* (Food, 2014:39). Human evolution is intertwined with adaptations facilitating food sharing (van den Berghe, 1984). Even

the human inclination to marry may be at least partially rooted in our desire to share food (Quinlan and Quinlan, 2007). Sutton (2001) suggests that food aid programs such as soup kitchens are designed to nurture the social as well as physical characteristics of people who might be marginalized.

"Our generosity reveals the degree to which we are independent of need (Furrow, 2016:19)." Well, at least that's true for most people at some time. At other times, when the going gets rough, people may count on the same folks to whom they previously offered aid to extend the same kindness to them. For most people, those folks are family members, kin. Human infants are utterly helpless, so parents must share their food with them when they are tiny. Then again, when parents become elderly it will be their children's turn to provide for them. Even for people who are only distantly related, or not at all related, the sharing of food and or other support can create kin-like bonds. For example, in the not-too-distant past it was considered good form for suburban Americans to offer baked goods to new neighbors. Food sharing reinforces group cohesion and pride (Anderson, 2005). Just within the family unit, sharing food every day strengthens the bonds between family members (Williams, 1984). The act of sharing food necessitates both trust on the part of the recipient and generosity on the part of the giver (Furrow, 2016).

Mauss (1967) literally wrote THE book on the use of gifts such as food to foster social interactions. In the cultures that he references, Samoa, New Zealand, and Melanesia, sharing is an action that takes place between groups of people (e.g. Clans, tribes, or families), not just between individuals. Pollok (1992) notes that on Namu Atoll in the RMI, people would not express open dis-satisfaction with meals because doing so would reflect poorly on everyone involved in gathering and preparing the food - which was everyone.

A sense of community may lead to a higher level of satisfaction with the food itself (the opposite is also true). There is pleasure in eating a dish that has been lovingly prepared by one's family or friends (Furrow, 2016; Herz, 2018). In some cultures such as that of the Cook

Islands, Alexeyeff (2004) writes about how gifts of food plainly replace the cheaper habit Americans have of saying out loud, “I love you.” Sometimes even in the broader American culture, there are instances of gifts being used to express love, as originally noted by Christian self-help guru Gary Chapman (Receiving gifts is one of his “5 Love Languages”). Well, the translation isn’t exactly a direct one in the sense that giving a Cook Islander a coconut doesn’t mean you’re in love with them. In this case, a different kind of love is being expressed, a kind that encompasses topophilia, fondness, and spiritual blessings.

Perhaps as a consequence of the practice of food sharing equating to love and social acceptance in many societies such as the Cook Islands, when people are without their friends, family, and traditional foods (as they are when they move from the Islands to mainland countries), they may experience intense feelings of loss even if they have access to other foods that are equally nutritious (Alexeyeff, 2004).

Food and Special Events

Food is an important part of many gatherings, including religious meetings. At the synagogue I attended growing up, the services were solemn and highly structured, but the *onegs* (featuring trays of kosher cookies and *rugalach*) that followed were relaxed social occasions. Prosterman (1984) wrote about the role of food in traditional Jewish-American celebrations, like those of my childhood. She noted that hosts often requested certain foods from their caterers just because those foods represented their culture and not because they were particularly fond of - or even familiar with - them. Humphrey (1989) has also distinguished between recipes served at family dinners (in the private sphere) and recipes served on traditional holidays/special occasions (in the public sphere).

Like Marshallese people in Springdale, Prosterman’s Jewish respondents wanted copious amounts of food at their parties – much more than could be eaten (especially in the case of dessert). She labels it a “psychological craving”. During holidays, some people like to

connect with or even attempt to recreate memories from their past. They may be able to do this through food (Humphrey, 1989).

All Foodways are Hybrids

With very few exceptions (the Arctic Inuit), the reality of ethnic foodways is that they are not "pure" (Kalčik, 1984:39). They all have histories of creolization, the interaction of multiple influences for the creation of a new form. Mixing is a form of creolization. Mixing may occur among ingredients or completed dishes. Sutton (2001) noted that in Greece, foreign food such as French cheese could undergo traditional types of processing (mixing with feta cheese) to make it more acceptable. Additional forms of Creolization include substitution, wrapping, compression, and alternation (Wilk, 2002). In their study of Vietnamese immigrants in California, Vu and Voeks (2012:38) refer to the substitutions of new locally available ingredients in Vietnamese food as a process of "Americanizing" or "watering down" the "Vietnameseness" of traditional meals. Harbottle (2000:61) uses the term "west-toxification", which emphasizes the pollution of traditional culture by the products of the Western world, especially in the seduction of the younger members of the group. The term comes out of Iran's strict Islamic society, but can easily be applied to other situations. With this term in mind, it seems reasonable to equate traditional food with less "toxins" and higher cultural value. The toxins might be chemical or they could be moral. New ingredients which are more readily available in the new environment may also be substituted for rarer traditional ones (Wilk, 2002). Since items that are more difficult to obtain are often more expensive, cost may also be a factor in food selection within different socioeconomic divisions of a group (Gray et al., 2005).

"At a distance from the home country, ethnic or national cooking tends first to become simplified and compressed, with a focus on a few prominent, emblematic dishes such as chow mein, tacos, or spaghetti (Wilk, 2002:81)." Special occasion meals become more prominent than everyday meals (Miller, 2013). In his work on cookbooks in India, Appadurai (1998) also

observed compression, or the decrease in what he referred to as "nuances" in ethnic food.

Many food items that were formerly considered "ethnic" are now American staples. Examples are pizza, bagels, hamburgers, and hot dogs (Miller, 2013).

Cook Types

In his 2013 book on soul food, Miller divides cooks into four categories with respect to how each prepares the dish "greens". His categories of Traditionalist, Pragmatist, Reformer, and Progressive are widely applicable. The Traditionalist prepares the dish in the traditional manner, using fresh ingredients. The Pragmatist prepares the dish using whatever is available (He "lives in the moment (p.146)"). On the other hand, the Reformer will get creative with the recipe, while the Progressive will radically diverge from the traditional recipe.

The Significance of Cooking

Cooking renders tough, often toxic, plant products edible (Le, 2016). Wrangham (2009) famously hypothesized that cooking was the very discovery that led to the development of large human brains, culture, and ultimately to the success of humans as a species. Chemical changes that happen to some foods during cooking render them more palatable and digestible (digestibility of food is particularly important for the critical period of brain growth that occurs during the weaning of infants). However, Anderson (2005) reports that there is too little evidence for Wrangham's idea, because the archaeological record does not contain the amount of ashes that so many early cooking fires should have left behind. However, just because cooking was not likely the earliest practice to distinguish humans from their primitive ancestors does not lessen its bio-cultural importance. A "natural symbol" may be transformed into a "cultural symbol" through cooking, Gutierrez (1984) explains. She uses the Cajuns' crawfish as an example. Cooking serves another important esoteric purpose. For many people, past and present, in many different cultures, cooking is an expression of love. It can also be a means of

control, especially for women. Across the globe, kitchens are almost universally the domain of women (Wrangham, 2009).

Fading Traditions

For dinner tonight, I can leave my Jewish-Chinese household and drive to various ethnic restaurants (sadly not including Marshallese food, but Hawaiian food is an Oceanic option) to enjoy a taste of “Otherness”. Although I’m quite fond of home-cooking, it seems there is a bit of a stigma attached to it where money is concerned. Instead of being about love and sharing home-cooking is now sometimes considered cheap and plain, food for poor, unrefined people. The reasons why home-cooking has been devalued include the fact that it is unpaid labor, mainly performed by women (Primeau, 1992). Scholars have observed that immigrants who adhere most strictly to the foodways of their homeland tend to be the least assimilated into the broader American culture (Kalčik, 1984). People in general are notoriously stubborn in their eating habits – green eggs and ham, anyone? Still, there are several mechanisms that may work to erode the endurance of ethnic foodways. Kalčik (1984) lists these mechanisms as age at immigration, occupation of the head of household, education level of the household cook, family composition, the economics of grocery shopping, convenience of food procurement and preparation, commercialization, urbanization, and the perceived status of traditional foods. Although the listed factors mostly work against tradition, they may also sometimes have the opposite effect. For example, people who immigrate when they are fairly young and those who are born in the US to immigrant parents tend to disdain the foodways of their homeland in favor of America’s “cool” hamburgers, and fries. However, third generation ethnic-Americans are quite likely to embrace and revitalize the traditional foods of their culture. The practice and propagation of any specific foodway hinges on social interaction (Goode et al., 1984). Some people believe that traditional foodways are among the last cultural differences to become eroded, but that may only be true for communities that are mostly closed to outside influences

such as the Amish. Groups that are more interactive may find their traditions wearing down more rapidly (Goode et al., 1984).

The Nutrition Transition

For better (in the case of “developed” countries) or for worse (in many “developing” countries), the majority of humans today don’t eat the way their ancestors did 250 years ago (Pelto and Pelto, 1983). Exceptions might be considered for the relatively small groups of hunter-gatherers residing in the Arctic and other extremely isolated environments. In general, the human diet has changed to become more diverse as a result of the migrations of humans, plants, and other animals, as well as industries. Pelto and Pelto (1983) use the term “delocalization” to refer to this broad process. Aside from the effects that delocalization has on diet, there are also cultural effects. Kalčík (1984) points out that in order for ethnic groups to retain their special traits, they must be bounded.

Technological advancements (“industrialization”) may also contribute to dietary changes (McGuire and Beerman, 2007), but they do so less frequently than delocalization (Pelto and Pelto, 1983). Whatever the cause or causes, there has been a marked change in the health of most populations even since the last century. Where people were frequently undernourished, they are now overnourished, and this trend is known as the “nutrition transition” (McGuire and Beerman, 2007) following the co-occurring demographic (populations are aging) and epidemiological (chronic diseases are replacing communicable diseases) transitions.

In developing countries, the nutrition transition appears to be speeding up (Popkin, 2012). There are several factors hastening this transition. One factor is of course dietary changes. Globally, people are consuming more added sugar and other sweeteners (especially in the form of sodas (Borges et al., 2017)), more meat and dairy products (plants are for poor people), and more plant oils such as canola oil (Kearney, 2010). Another problem is a decrease in physical activity levels as new technologies become available to either save time (cars and

vacuum cleaners) or waste time (television sets). Finally, there may be a biological component to consider. Different people respond differently to certain foods and or stresses (Popkin, 2012).

With the aid of modern medical technology, the nutrition transition has experienced an accompanying epidemiological transition. As the 1900s dawned, infectious diseases were the leading cause of death in the US. Infectious diseases are communicable, since they are the work of pathogens such as bacteria and viruses. Some examples of the worst infectious diseases in the 20th century US were tuberculosis, pneumonia, and diarrhea. In contrast, by the time the 21st century rolled around, the main threats to American longevity were chronic diseases (and accidents). Chronic diseases, including cancer, diabetes, and strokes, are not contagious. Yet in some ways, they are more insidious than those caused by pathogenic agents. Chronic diseases slowly and steadily debilitate and kill. Infectious diseases may be prevented, treated, even cured, via the miracles of modern medicine (e.g. antibiotics and vaccines). Unfortunately, chronic diseases resulting from poor lifestyle choices, or from poor luck in the genetics department, are much more difficult to treat (McGuire and Beerman, 2007).

Scientific research doesn't support the widespread beliefs that the poor health effects of the nutrition transition are caused simply by people eating more food and exercising less than they used to (Le, 2016). It's more complicated than that. The problem is that people are eating the wrong foods. As for exercise, Le (2016) suggests that all things considering, the problem these days is not a lack of exercise but a lack of stimulation. Just as people are not eating the right types of food, they are not engaged in the right types of activities (watching TV is especially unhealthy).

Traditional Cuisine

The biological and cultural sides of food pair up to form traditional cuisines. Traditional cuisines are the product of intimate ecological knowledge (Le, 2016), thus they should be more sustainable than say the globalized cuisines represented by McDonald's and other major fast food chains. In addition, because they have co-evolved with humans for hundreds of years, traditional cuisines are uniquely suited for their nourishment. After all, "creating a tasty balanced diet from scratch is a lot tougher than eating something that was tested and savored over hundreds of generations (Le, 2016:113)."

What is "Traditional" Food?

"Traditional" is an abstract concept difficult for people to define (Guerrero et al., 2009). The term "traditional" generally has positive connotations when it is applied to food, even though it implies that the food is old-fashioned. When it comes to cuisine, older (over a hundred years or more) traditions tend to be healthiest (Le, 2016). Of course, traditional foods need not be quite that enduring. Labelling a food "traditional" is a form of approval (Humphrey, 1989). For something, a food, to have authenticity, it must have primarily a commitment to continuity (Furrow, 2016). Harbottle (2000) notes that although continuity in tradition is important for cohesion of cultural groups, change is often necessary. Often, foods labeled traditional are those time-tested recipes handed down from grandmothers or great-grandmothers. Once a recipe is determined to be traditional, it gains respect (Humphrey, 1989). Aside from cultural benefits, traditional foods can benefit communities economically. Guerrero et al. (2009) list several economic advantages to marketing traditional food products (TFP) in Europe including rural development, consumer choice, and sustainability.

Traditional Foods Are Healthy

Human bodies evolved to adapt to regional diets over hundreds of generations. Conversely, the nutritional transition has occurred in about the past hundred years.

Unfortunately, many Americans today are unable to trace their ancestry back to a single part of the world and accompanying regional cuisine. Therefore, it may be difficult to know which traditional diet to follow. Michael Pollan perhaps gives the best, simplest advice on traditional fare as, “Don’t eat anything your great-grandmother wouldn’t recognize as food (Pollan, 2009:7).” Unfortunately, the global population is now too large to ensure adequate calories for everyone should humans revert to pre-Green Revolution agricultural practices (Lang, 2010). One additional issue with the idea of traditional cuisines is that it seems a bit environmentally deterministic.

EATING MARSHALLESE

"I went to the Outer Islands one time and that's what they made one night. And you know, the cookhouse was right by the beach. And so you just go sit out on the sand and just eat it with your cousins. There was just nothing like that. I don't think I will ever have that experience here in the States."

Thirty-six year old woman from *Mājro* Atoll, Republic of the Marshall Islands, referring to her experience with the traditional breadfruit soup called *jokkwōp*

A Brief Overview of Foodways in the RMI

Marshallese people view food much differently than do most Americans. After all, "food" is a culturally specific term. To a Marshallese person, the good health awarded by good food is not entirely a physical state. Food is not merely fuel for the body of one individual. For Marshallese people the concept of food incorporates a significant social component. Furthermore, the most valuable type of food is not meat, or "protein" - it's carbohydrate or "starch". And even then, enough food to feed oneself and one's family is simply not enough food, as extra is necessary for friends, neighbors, chiefs, and relatives (Pollock, 1992).

The term "traditional" Marshallese foodways is commonly used to talk about the distant past, before European contact started a cascade of cultural change in the Marshall Islands. Although people living on the Outer Islands of the RMI today may eat similar foods to those of their ancestors, their current diet is not "traditional" but "rural".

A Marshallese Meal

A traditional Marshallese meal consists of two types of food eaten together. *Ṁōñā*, the "real food", and *jālele*, the accompanying "sauce" (or "relish") (Pollock, 1992). Although the dichotomy is clear, it is different than that of Levi-Strauss because while the *Ṁōñā* is always

cooked, the *jālele* may be cooked or raw. Just as my Chinese husband does not feel full unless his meal includes rice, satiation (physical satisfaction) for Marshallese people requires both the *mōñā* and the *jālele*. Yet complete satisfaction with a meal goes a step beyond the physical level of the individual to include the community as well. This is a phenomenon Pollock (1992:31) refers to as "cultural satisfaction".

The Marshallese word for starchy food, *mōñā*, also means "eat". In keeping with this dearth of nuance in the Marshallese language, *nn̄* means both "tasty" and "edible". "The idea seemed to be," reasons Rudiak-Gould in his book, *Surviving Paradise*, "that if it doesn't kill you, that's the best food you're going to get (Rudiak-Gould, 2009:26)." A Marshallese proverb echoes this sentiment, "*Ḷḷje kōḷḷa*." It means that stomachs are like trash heaps, so don't be a picky eater (Stone et al., 2000:17).

Many Westerners have been disappointed by Marshallese foodways. Pollock (1992) classified the food supply on Namu Atoll as less varied and abundant than anywhere else she had visited in the Pacific. She also noted that there were no stores on the atoll at which to buy food, only the odd supply ship. Fresh food is not easy to store on a Pacific Island, and the amount of food that people ate varied according to the season. In the Outer Islands, Marshallese people eat whenever the food is available. When it is unavailable, there are problems with hunger. Unlike some other cultures in Oceania, Marshallese people did not overeat regularly (Pollock, 1992). Rudiak-Gould describes the food on Wūjae Atoll during the early 2000s as "a reverse Atkins: the four Marshallese food groups appeared to be starch, starch, starch, and starch (Rudiak-Gould, 2009:26)." Another more recently deployed WorldTeach volunteer said that after his one-year stint on Jālooj Atoll, he was "Not a fan of the food." The fact that the traditional foods of Pacific peoples were predominantly plant starches was noted by European explorers as early as the 1700s. Several Americans adapting to the foodways of the Marshall Islands during more recent visits have claimed that they didn't miss red meat as much as they missed fresh fruits, greens, and spices.

Daily meals in the Marshall Islands were not traditionally separated into breakfast, lunch, and dinner, so there seems to be some debate about the correct Marshallese expressions for these meals. Pollock (1992) notes that food and the time of day are combined to identify the meal, as in *mōñā in jibboñ* (morning food) for breakfast, and *mōñā in raelep* (mid-day food) for lunch. However, the standard Marshallese-English dictionary by Abo et al. (1976) gives *mjabuñ* as the entry for breakfast and does not have translations for either lunch or dinner.

On the Outer Islands, the cooking fire may only be kindled once each day to save on time and fuel. However, cooking must be done every single day because leftovers will not stay good for long in the Tropics. Cooking renders the starchy, sometimes toxic food edible. Once cooked, the food need not be eaten hot (Pollock, 1992).

Marshallese Foods

Traditional Marshallese food relies heavily on a few fruits. This contrasts starkly to the Western view of fruits and veggies prior to discovery of vitamins and nutrients in the early 1900s. Produce was viewed at best as excess roughage with no nutritional benefits and at worst as the cause of diseases such as cholera (Bentley, 2002). Marshallese *bwebwenato*, folktales, credit a female culture hero with the creation of the traditional diet. She not only helped to create the staple foods, she also taught the other gods and mortals when to harvest them and how to take care of them (Tobin, 2002). Traditional starchy plant foods include breadfruit (*Artocarpus altilus*) (both fresh, and fermented into *bwiro*), pandanus (*Pandanus fischerianus*), taro (*Cyrtosperma chamissonis*), arrowroot (*Tacca leontopetaloides*), and perhaps bananas (*Musa spp*), depending on the atoll. Most traditional Marshallese dishes are relatively simply, if not easily, prepared because of the short list of ingredients. For example, fermented breadfruit with coconut (*Cocos nucifera*) could be a simple meal that takes almost a year to prepare. Some more recent recipes for Marshallese soups and stews are more complex. The

flavors of Marshallese foods are sweet and mild. It has been proposed that the spiciness of cuisines inversely correlates to their meat content (Le, 2016). For example, the islands of Japan are surrounded by prolific fisheries and most Japanese food is delicately seasoned. The argument certainly holds true for the RMI, where the seafood heavy diet is known to be relatively bland.

"The food everywhere was terrible," Evans (1992:240) complains about the RMI in his 1992 book, *Transit of Venus*. He criticized Marshallese people in the Urban Centers for eating refined carbohydrates and giving their kids junk foods. Neither did he have anything nice to say about the diet of Outer Islands dwellers, which he describes as monotonous, mentioning breadfruit, coconut, and fish. And more fish.

An abiding tidbit of pop-anthropology claims that the Inuit have at least fifty different words for "snow". Whether this fact is linguistically true or not, the take-away point is that snow was something of which the Inuit had a profound and intimate knowledge. During what was surely an epic spell of boredom, Rudiak-Gould (2009) analyzed the Marshallese-English Dictionary by Abo et al. (1976). He counted 159 coconut-related terms, not including at least eleven words for specific ripening stages of the fruit. There were 73 entries having to do with breadfruit and 153 words relating to pandanus. Fish and fishing comprised 319 dictionary entries. The Marshallese lexicon does not have as many words as that of the English language. The fact that there are so many Marshallese words devoted to food indicates its importance and endurance in Marshallese culture.

The main tools that Marshallese people originally used in production of traditional Marshallese foods were digging sticks and poles (Pollock, 1992). Most traditional Marshallese foods require some degree of preparation. Traditionally, everyone except infants and sick people were involved in this preparation, especially for larger, celebratory meals. The division of labor is split according to gender. Men fish and climb trees to collect fruit, while women do the cooking. While performing these various tasks, people get to socialize with each other,

building a sense of community (Pollock, 1992). Community cooking is common in Pacific societies whose staple food is breadfruit because the size and abundance of the fruits make processing unmanageable for a single family unit. It does not mean that on a typical weekday after the breadfruit has all been processed (into *bwiro*) men will help cook meals for the family. Women are still expected to do the cooking for the family (Wrangham, 2009).

Bwiro

An important time in traditional Marshallese society was the Summer preparation of *bwiro*, fermented breadfruit. *Bwiro* has been described as the Marshallese “hamburger”, but more often as the Marshallese “cheese”, because like a fancy French cheese, *bwiro* may have a strong odor. The first Europeans, Spanish sailors, to encounter this particular food wrote that it stunk so badly they could not stand near it – and they were starving. It was explained to me that Marshallese elders do not find the odor of *bwiro* unpleasant but that other people prefer to knead the paste until most of the stinky gunk is squeezed out, then cook it in coconut milk to further sweeten it. I have enjoyed some small slices of the semi-sweet, grainy *bwiro* sprinkled with shredded coconut. I did not find the odor or flavor of it particularly strong. Today, there are a few different kinds of *bwiro* available in the Marshall Islands. One kind sometimes encountered at special events such as parties and box-lunch fundraisers resembles gelatinous bricks with a reported “bean-like taste”. With its strong flavor and chewy texture, this particular kind may be repulsive to American palates. “I had a hard time physically swallowing it.” Said one WorldTeach volunteer.

Marshallese Cooking

In Pacific societies, a meal has two, equally social parts: Preparation and Eating (Pollock, 1992). Cooking fires in the Marshall Islands were traditionally made from coconut husks, which Takeuchi compares favorably to mesquite. Fires made from coconut husks burn

hot, steady, and smoky. "The result on marinated chicken is sublime (Takeuchi and Koning, 2010:50)." Of course, chicken (*Gallus gallus*) is not a traditional Marshallese food in the time-tested sense of the word. Rather, traditional Marshallese foods cooked over coconut husk fires would have been fish and breadfruit. These foods, and sometimes bananas, could be grilled on rocks in the fire or roasted in the coals. In the RMI today, fires may be lit with matches. However, when matches are in short supply, fire is shared with neighboring households or kept smoldering (Pollock, 1992). It is typically the women's job to tend the cooking fire.

Boiled foods and soups/stews are more recent additions to Marshallese cuisine (Pollock, 1992) because in ancient times, the Marshallese did not have cooking pots. The missionaries brought cooking pots with them in the 1800s. The WorldTeach volunteer I spoke to was not impressed with boiled, unseasoned fish - "It tastes like the Ocean in the worst way." He preferred the more common grilled or fried fish. Some traditional Marshallese dishes prepared by boiling are *kojeiaat* (boiled preserved breadfruit) and *jāibo* (dumplings) (Abo et al., 1976).

Frying is another more recent addition to Marshallese foodways. In frying, food may get hotter than the boiling point of water, so the outer layer dries out and becomes crispy. The depth of flavor that may be achieved by frying foods in fats/oils is also much tastier than that of boiled food (McGee, 2004). In the RMI, *namonamo*, pancakes like those eaten for breakfast in America, are fried. Other fried foods include banana fritters and small fish. However, because cooking oil must be imported, such foods tend to be luxuries (Pollock, 1992).

The Umj

In the RMI, the earth oven is called an *umj*. Although such ovens have been popular throughout the Pacific for centuries, some scholars believe they may be a more recent introduction to Micronesia (Pollock, 1992). Inside the *umj*, food such as pork and large fish can be heated evenly without drying out. Preparation of the *umj* has traditionally been men's work,

like many backyard barbeques in the US. Pollock (1992) outlines roughly ten general steps of earth oven cooking. First, a hole is dug in the sand near a family's home. The size and depth of these holes vary. Of course, they can be very big when several families work together to put on a feast. However, the method of preparing a larger *umj* is the same as that of preparing a smaller one. Next, the hole is lined with stones. Fuel is added in the form of coconut husks or driftwood and the fire is lit. As the fire burns down, the ashes are moved to one side of the pit and hot stones are picked out with tongs fashioned from the bent midrib of a coconut leaf. Green leaves are placed on the hot stones and food is sandwiched between the leaves and additional hot stones. Finally, more leaves, mats, or even empty flour sacks are layered on top and covered with earth. The *umj* is left to slowly cook the food for at least two hours. Wrangham's (2009:124) research indicates that earth ovens are ideal "for gelatinizing starch and other carbohydrates", as in the Marshallese dish *peru*, pandanus pudding. Peru is wrapped in a leaf packet and baked in the *umj*. In their neat packets (which are more often today made of aluminum foil than leaves) such puddings could be taken to eat as snacks any time of day (Pollock, 1992), and packed for long ocean voyages. Wrangham also adds that meats cooked in earth ovens come out quite tender and juicy.

A far newer technology, the *umj in gajolin*, is often used in the RMI these days. This gasoline oven is simply a fifty gallon drum laid sideways in the sand. A lid is cut out and rocks and fire are placed inside. In addition to saving on fuel, the gasoline oven produces the drier heat needed to bake white bread (Pollock, 1992). By the time Pollock visited Namu in the 1970s, most people there had these types of ovens. They cook food quicker than the *umj* and require less fuel. However, the *umj* was still used on the weekends and special occasions. In the 21st century, it is less common for visitors to the Outer Islands to see a traditional-style *umj* in action (C. Burrus, 2016, Personal Communication).

Food Sharing

A well-known Marshallese proverb goes something like, "*Kandikdik in/kōn iōkwe*", or "Share whatever small food you have with love" (Miller, 2010:146). Le (a Vietnamese-Canadian with apparent Marshallese values) asserts that the "original role" of food is "as a means of binding and protecting citizens (Le, 2016:190)."

Pollock (1992) observed that at the household level, food was prepared communally in the extended family's cookhouse. Nuclear families then ate together (in the cookhouse or on outside mats), either taking handfuls from one pot or using bowls fashioned from halved coconut shells. Spoons could be made by twisting coconut leaves. The men and children of the family get served first. Elders were also served before everyone else (Rudiak-Gould, 2009). If a person was absent from the meal because he was out fishing or something, food was set aside for him. Friends, neighbors, and other folks who happened to pass by during the meal were offered food as well. Enough food needs to be prepared at each meal to feed all these people, but it is impossible to calculate exactly how much, so cooks tend to err on the side of abundance.

Feasting

Feasting, which occurs throughout the Pacific as well as in other places, is food sharing on a large scale. Although to Europeans feasts may seem wasteful, they are extremely important for Marshallese people as an opportunity to act out power roles, strengthen bonds between friends, neighbors, and kin, and redistribute material goods. In Marshallese culture, as in most groups, there are different degrees of feasting. For example, Christmas is one of the times for the highest level of feasts, but the typical Sunday after-church meal would be one of the lower ones. "Election time was also feast time." Writes Rudiak-Gould (2009:85). "Each candidate organized a lavish campaign party replete with all manner of Marshallese cuisine." Pollock noted a few differences between a normal meal and a feast (Pollock, 1992). In the

Marshall Islands, several households work together to prepare a feast. Another difference between a feast and a normal meal was the preparation of chicken or pork. Pollock notes that on Namu in the late 1960s, every household in turn presented a large gift to the chief. These gifts included chicken, large fish, or local foods such as breadfruit and coconuts. A fact noted by the first Europeans in the Pacific was that the chiefs there did not eat meat in larger portions or more frequently than any of their subjects. Instead, the food was shared fairly equally. Since everyone worked together and contributed to the feast, everyone received a portion. They ate a little bit at the feast and took the rest home to eat as leftovers. The food presented at a feast does not necessarily have to be special, it just has to be sufficiently abundant in quantity and variety. The more food that is in front of people, and the more people that are present, the more they are likely to eat (Herz, 2018), which could further explain feasting as a way to ward off hunger in Island cultures.

Food redistribution and gifts are still common (Hezel, 2013). One Springdale resident interviewed in 2015 spoke of taking garden produce to local leaders (*a/ap*) with her father when she was a child in the RMI. Although food is the traditional gift to honor someone, these days it could be material goods. At some of the events I attended as a special guest in Springdale, I received many beautiful items including shell necklaces, hair clips, daintily trimmed washcloths, and a purple handbag. "In Micronesian societies," explains Hezel (2013:30) love implied a willingness to nurture an individual, primarily through food in traditional times, but increasingly today through generosity with money and other resources." Food sharing displays both respect, generosity, and power. It helped ensure that everyone living in the precarious environment of the Marshall Islands had something to eat, although the kindness of the early Marshallese people was not unlimited when circumstances were dire (D'Arcy, 2006).

The value of reciprocity that once assisted Marshallese people in their survival has not served them well in exchanges with the US, which have historically been unbalanced. For example, one of the reasons why it was relatively easy to convince the Bikinians to desert their

home atoll in 1946 was because the US had just recently liberated the Marshall Islands from the Japanese military rule of WWII. The Marshallese wanted to do something for the US as a means of returning the favor (Barker, 2013).

The Specter of Hunger

Before globalization, life in the Marshall Islands was precarious. While there is some scientific evidence to suggest that intermittent fasting is healthy, starvation is definitely NOT a desirable condition. Famine could easily occur in the Islands after a typhoon or a drought. With the exception of a few salt-tolerant varieties, most atoll plants require five to seven years to recover after a destructive typhoon (D'Arcy, 2006). Sharing food is one way to prevent any individual or small group from starving. One Marshallese saying about famine goes, "When we go down, we all go down together" (Pollock, 1992:201). Another way to alleviate famine, at least in the ancient times, was to find new islands to colonize (D'Arcy, 2006).

Food Storage

Despite an environment that accelerates putrefaction and a general lack of modern refrigeration, there are several ways to "keep" food in the tropics. In the case of the fast-ripening breadfruit, the Marshallese use fermentation to make *bwiro*, which can last up to fifty years. Breadfruit, as well as pandanus and fish, could also be dried. Pandanus and arrowroot were ground into flour. Taro could be preserved by delaying its harvesting, as the plant has no dormant period. *Cyrtosperma chamissonis* is the slowest growing plant in the aroid family. It can be left in its swamp pit for up to ten years (Pollock, 1992).

Marshallese people were able to thrive in their unique environment by storing food, eating from a range of starchy plant foods, and maintaining good ties with friends and family. In the past, they did not place undue pressure on any one food resource. However, in the 1800s when Europeans began demanding supplies for their ships, the local food, water, and fuel

supplies began to decline. Unfortunately, rapid population growth in the RMI has been emptying the *bwiro* pits faster than ever (Pollock, 1992).

Health

The traditional Marshallese diet was high in carbohydrates and fiber, but low in refined sugar. Herz (2018) explains that CHOs from fruit are in fact more satiating than those from processed items such as baked goods and candy. It is estimated that although caloric intake varied from day to day, over the course of a year it averaged out to 2,000-3,000 calories per day (Pollock, 1992). Based on past fertility rates (10-15 children per woman), scholars agree that traditional Marshallese foodways were adequate for meeting the nutritional needs of the population. American Atkins Diet devotees may not believe that a carb-laden lifestyle could be so healthy. The reason that it suited the Marshallese people so well probably had to do with their uniquely adapted microbiota, as different bacteria extract different amounts of energy from carbohydrates (Ramakrishna, 2013).

Although Micronesian babies weigh less at birth than their Australian counterparts, they flourish during their first year (Pollock, 1992). Micronesian people are often small-statured and of course, the size of a woman's baby is proportionate to her own size (Barker, 2013), so it makes sense that Micronesian babies will be on the small side. Low birthweights are further attributed to a mother's nutritional status, especially during her third trimester of pregnancy. In many countries, the major dietary cause of small babies is a lack of micronutrients. Petite mothers may believe that there's nothing inherently wrong with having small babies, and in fact, smaller people are certainly better adapted to periodic food scarcity (such as occurs living off an atoll environment) because they require less food. However, smaller people naturally have smaller organs that are more susceptible to chronic diseases (e.g. type II diabetes, stroke, heart attack, and stress). Barker (2013) identifies exactly the low birth weight-rapid weight gain

growth pattern mentioned by Pollock (1992) as a major indicator of heart disease later in life. Pollock (1992) also noted that Micronesian children's nutritional health began to deteriorate when they switched to adult foods.

The trouble is, the Marshallese concept of health differs from the sterile, clinical concept promoted by Western allopathic medicine. Health in the Marshall Islands has more to do with the good of the group than the physiology of one individual. Eating the "right" foods definitely factors into Marshallese health, as food and medicine are traditionally closely linked. Eating enough food to feel full is also important. Other factors include adhering to the code of conduct appropriate for one's religion/gender/age/etc. Nutrition studies of Pacific peoples that follow Western assumptions such as the need for regular, structured meals can create skewed versions of Pacific health (Pollock, 1992).

Breastfeeding

After the contamination of their atoll by the "Bravo Shot", Rongelapese people were unsure if breastfeeding was safe (Smith-Norris, 2016). Breastfeeding is usually considered a good practice because it has many benefits, such as reducing the risk of obesity for the baby when it grows up (Whittle et al., 2012).

Radioactivity and Traditional Foods

After US nuclear testing in the Islands, many atolls were so badly contaminated by radioactive fallout that the plants, animals, and fish remaining on them became toxic. When Marshallese people were told not to eat their local foods, or when local foods were not abundant enough in relocation zones, they were given canned subsidies from the US. The canned foods were high in fat and sodium (Barker, 2013). The Marshallese people could tell that the US foods were unhealthy (Smith-Norris, 2016), but they had no other options.

After the nuclear tests, arrowroot productivity steeply declined. Some coconuts, pandanus, pigs, and fish appeared with noticeable deformities. Other staple plant foods, as well

as some animal foods, did not look different but contained unsafe amounts of radionuclides. One of the most problematic radioactive substances in Marshallese plants is Cesium (Cs)-137. Uranium, Plutonium-239 and Pu-240, Strontium-90, radioactive Zinc (Zn-65), and radioactive Iodine are also significant pollutants that render locally harvested foods unsafe in former testing areas. In the early 1970s, samples of foods such as pork and papaya from Pikinni Atoll were found to contain 100 times more plutonium than the foods available in New York City (Smith-Norris, 2016). Some remediation efforts on contaminated atolls such as Āne-wātak include scraping off the surface layers of soil and replacing with new soil from elsewhere, and treating the contaminated soil with potassium chloride (KCl). The KCl binds radionuclides such as Cs-137 so that plants can't incorporate them. It also fertilizes plants.

Smith (2005) views the contamination of the Marshall Islands as a crime against Marshallese women, citing the harmful effects of the radiation on reproduction. Trask (2002:254) makes a similar case in Hawaii. Although Hawaii was not a nuclear test site, it does have a history of US colonialism much like the RMI. Trask blames that colonial history on the "lack of control" that Hawaiian women have over their bodies, not just of their reproduction, but their health and diet in general. "Therefore, poor Hawaiian health is directly traceable to Americanization of our country, including loss of our lands where we once grew healthful Native food. High breast cancer rates for our women are similarly related to our forced assimilation into the junk-food, supermarket, American diet. In specific cases like these, our problems – such as high infant mortality, oppressive working conditions, and low wages – relate to our loss of self-government and the subsequent loss of control over our lives."

Changing Foodways in the RMI

Traditional foodways were not static and un-changing and Marshallese people tend to be rather accepting of ongoing adaptations. However, the dynamics of the past were trivial

compared to those of the past century. Traditional Marshallese foodways persisted until roughly 1945, when WWII increased the urbanization of the Pacific. As in many societies, food is seen as an identity marker in the RMI. So it makes sense that the local food renaissance there happened to coincide with the independence movement of the 1970s (Pollock, 1992).

During the Japanese occupation of the Marshall Islands, from 1920-1945, there were trade stores on most atolls. Canned fish, rice, cotton cloth, and other foreign goods were available at these stores. However, Pollock (1992) notes that the imported food merely added to the Marshallese diet (at least while the Marshallese people were allowed to have it). Imported food could not completely replace local staples because of the irregularity of deliveries - it still can't. Perhaps because of their rarity, Western foods, especially American foods, have increased status in the RMI. "They served Kool-Aid, but treated it like Perrier; ate Spam, but savored it like filet mignon (Rudiak-Gould, 2009:223)."

It has been estimated that 85% of the calories ingested by people in Oceania come from plant starch. The nature of the plant starch chiefly consumed in the RMI today has shifted from breadfruit to rice. "LUNCH OR DINNER IS NOT COMPLETE WITHOUT RICE (emphasis original) - even if you have breadfruit or another starch," a WorldTeach volunteer wrote (C. Burrus, 2016, Personal Communication). "The rice has to cover the whole plate", a Marshallese friend explained (J. Rubon, 2015: Personal Communication). And Marshallese plates can be quite large. Rice is especially prestigious in the Outer Islands, even more so than other highly coveted imports such as canned goods, coffee, and cigarettes (Johnson, 2013). The increased status of highly processed foods such as white rice and canned goods has been observed in other formerly colonized regions such as Belize (Wilk, 2002). Often, these industrialized foods are seen as symbols of America (Gabaccia, 2002), resplendent with scientific innovation. Miller (2010:46) refers to this phenomenon as "valorization of the other". In the RMI, valorization of foreign foods extends to the generous treatment of foreign people. However, traditional foods are still popular gifts for chiefs and visitors, both in the RMI and in Springdale.

Diabetes in the RMI

In the early 1980s, diabetes was already a scourge in the newly minted RMI, at least on Mājro. The hospital's nursing director at that time, Phil Hunt, told Nakano (1983:134), "Their food is so bad. They eat rice, breadfruit, taro root, fish and pork, but they won't touch vegetables. The children don't like fruit so their parents compensate by giving them soft drinks, which cause malnutrition. They drink too much pop and eat too much candy. You import thirty tubs of ice cream and in two months it's all gone. They also suffer from hypertension and have cardio-vascular problems because of lack of exercise and obesity. There are many amputees here because of gangrene, sores, and diabetes." But the question looms: Is the especially high prevalence of diabetes (mainly type II diabetes) among Marshallese people related to radiation poisoning? Although tempting to blame the epidemic on a late blooming nutritional transition, it seems there must be additional factors, whether genetic or environmental (or both), exacerbating the issue.

In general, people in urbanized areas of the Pacific are eating more refined carbohydrates, sugar, fat, and salt, and less fiber than they traditionally have eaten. While Rudiak-Gould (2009) found the Western-style supermarket on *Mājro* to be expensive, he noted that it did sell fresh fruits and vegetables whenever a supply ship came in. Today, food accounts for 20% of imports to the RMI (Thomas, 2008b). Dietary changes have led to increasing cases of obesity, disease, and malnutrition (especially in children) (Pollock, 1992). Of course this pattern of dietary change and increased chronic illness, termed the "nutrition transition", is by no means restricted to the Pacific. With the addition of fried foods, industrially processed foods, and health problems, body composition has become an issue in the RMI. Traditionally however, a fat body was considered healthy. It showed that a person was well cared for (Pollock, 1992). Evans (1992) criticized Marshallese mothers on *Mājro* for feeding

their kids junk food. While on *Namu*, Pollock (1992:223) observed that a slightly chubby figure was valued over a slim frame, but obesity was considered an "encumbrance".

Meal Patterns in the RMI

On weekdays, people still wake up at dawn (around 6 am) on the Outer Islands and have breakfast soon after, before the children leave for school (C. Burrus, 2016, Personal Communication). Breakfast is usually simple, sometimes sweet and starchy as in the US. The morning meal might be pancakes, donuts, bread, *jāibo* (dumplings), ramen, or leftovers from the evening meal. Pollock (1992) notes that leftover starchy food such as rice may be eaten for breakfast without *jālele*. People generally feel more satisfied by food they eat earlier in the day (Herz, 2018), making breakfast a very important meal in all cultures.

On *Namu*, Pollock recorded that the different households normally cooked at different times of day, resulting in several options for children (or sometimes adults). Her host family ate around 10:30 am when "a pot of rice with coconut cream, or some breadfruit roasted in the coals, would be ready. . . together with a pot of tea (Pollock, 1992:43)." That was her "lunch", which she ate at home with the other women. The children and men sometimes came home for lunch. Other times they went to another home (especially if something more desirable was being served there like pancakes or coffee). The youngest children at home with the women were fed a special meal of sweet tea and starchy soup around noon. Rudiak-Gould (2009) ate rice (plain or with coconut oil) with breadfruit, green bananas, or taro, for lunch.

What Americans would call dinner is the main Marshallese meal, starting around 4:00 pm with the creation of the cooking fire, and typically consisting of fish and starch. Pollock (1992) usually ate her fish grilled. Rudiak-Gould (2009) ate raw, unseasoned fish for dinner (along with starch of course). Miller (2010:130) also typically enjoyed a "customary dinner of white rice and a whole raw reef fish marinated in lime juice" during her stay on *Namdik* Atoll in

the 2000s. *Ta Kijom in Jota* is a children's song about dinner. The translation given by Rudiak-Gould (2009:39) is, "What are you eating for dinner? What are you eating for dinner? / Breadfruit breadfruit breadfruit, sprouted coconut seedling sprouted coconut seedling sprouted coconut seedling, papaya ya ya ya ah ya / What are you drinking during dinner? What are you drinking during dinner? / Coconut sap-sap, coconut syrup-syrup, coconut sap by-product, product product product ah product."

During the weekdays, Marshallese meals are more or less similar. The adult women in each household (generally sisters) often took turns cooking for everyone on different days. This may have been because of a traditional taboo against men eating food cooked by menstruating women. By taking turns cooking, women could rotate their chores according to their cycles (Pollock, 1992). Then, on Saturdays, a huge amount of food was cooked in preparation for the sabbath. The food was cooked on Saturday evening, when a little of it was also eaten. Most of the food cooked on Saturday was eaten after church on Sunday, around noon. On Sunday night, people ate the leftovers. They did not cook on Sunday because the missionaries who converted the Marshalls frowned upon cooking on the day of rest (Pollock, 1992).

Culinary Tourism

Today most travelers want to try local foods, making them culinary tourists (Long, 2004). The RMI may be an "unlikely destination for the foodie (Takeuchi and Koning, 2010:47)." However, at the Enra restaurant in the Marshall Islands Resort on *Mājro*, tourists can dine on popular Marshallese dishes such as fresh sashimi sprinkled with calamondin juice, pumpkin rice, breadfruit in coconut milk (*mā kalel*), and coconut soup with flour dumplings (*jāibo*). Jitban Jacklick, the head chef, also creates fusion dishes such as pandanus brulée. Takeuchi and Koning (2010:47) highly recommend a couple of Chinese restaurants (Monica's and Won Hai Shen) on *Mājro* as well. Takeuchi compares *Mājro*'s culinary scene favorably to that of the

Samoa, French Polynesia, and Fiji, promising prospective visitors there is more to the RMI than coconuts and fish.

Fresh tuna is a common ingredient on local menus, as well as wahoo, mahi-mahi, and grouper. And although it may be hard to come by, pandanus juice is apparently a drink not to be missed (Takeuchi and Koning, 2010). Perhaps if Evans were to return to the RMI today, he would have a better time than he did twenty years ago.

If you do visit the Marshall Islands, be sure to try the food – if you want to really relate to the people there (and those in Springdale). One WorldTeach volunteer who returned from *Jālooj* Atoll to the US noticed that Marshallese people in Springdale kept asking him the same question: “Did you eat Marshallese food?” He compared it to the first questions typically asked by American strangers: “Where are you from?” and “What do you do?” It shows how food-oriented Marshallese culture is.

Food and Language

Language is important in the transmission and persistence of TEK. Thaman (2008:65) underscores the importance of plants in the RMI, “Without a young generation that knows the names and value of plants, many more important plants will undoubtedly be neglected, degraded, and disappear from the 21st Century landscape of Majuro [sic] Atoll.” In addition to plant names, the names of specific dishes are important as well. They can reveal things about the components of the dish and how it is made. For example, Miller (2013) asserts that a dish called “bacon and green” indicates the prominence of bacon, which is listed first. And the language of eating can also tell scholars about how a culture views food. “In the Marshalls, the edible class is one of seven classes of nouns, each of which takes a different form of possessive (Pollock, 1992:39).” Smoking a cigarette is considered a form of eating.

Eating and the Ecosystem

“Ecosystem services” is a buzzy term in today’s literature that is generally used to indicate the seemingly free-of-charge (no actual money changes hands) benefits that nature provides to humans (Nahlik et al., 2012). There are four main types of ecosystem services: Supporting (cycling nutrients, for example), provisioning (such as food), regulating (carbon sequestration, perhaps), and cultural (parts of rituals, or memories). Most plants can encompass two or more main types of ecosystem services. The services that are most germane in this study are the ability of the ecosystem to provide sufficient nourishment for a limited number of people, and also the importance of the ecosystem of the RMI as an ideal in Marshallese culture.

As omnivores, humans tend to enjoy some variety in their diet. Although traditional Marshallese foodways are not based on a wide range of plant species, they had variety in their meals due to the changing of the seasons and different processing techniques (Pollock, 1992). Plant foods and fishing are governed by seasonal cycles. The main breadfruit crop ripens between April and June and the main pandanus crop is ready between November and December (Pollock, 1992). Winter may be an especially lean time of year in the Outer Islands depending on the schedule of the ships that bring provisions such as rice and flour (Rudiak-Gould, 2009). During his visit to the RMI in the late twentieth century, Evans (1992) noted the cultivation of giant swamp taro, pandanus, breadfruit, coconuts, and papayas. Several researchers (Pollock, 1992; Ragone, 2007) have pointed out the need for development of new varieties of Marshallese staple crops such as breadfruit. It is especially important to breed for salt-tolerance in breadfruit because of the increasing frequency of climate-change triggered flood events that directly expose the trees to salty water. Flood events (i.e. storms and king tides) also indirectly expose the trees to brackish conditions by contaminating the supplies of freshwater that are used for crop irrigation (Goodell, 2017).

In the RMI, which is spread out over a considerable expanse, different atolls are famous for different foods. For example, Namdik Atoll is popular for its bananas and Jālooj Atoll claims to be the origin of the coconut candy called *ametōmja*.

Marshallese Foodways in Springdale

Little to no previous research has examined the Marshallese food traditions in earnest in the Springdale community. However, numerous academic studies and articles in the popular media that feature this community do contain at least passing mentions of their foodways, indicating the prominent role of food in Marshallese culture.

Meals and Feasts

Keemems, traditional first birthday parties, are an important component of Marshallese culture in Springdale. They are fairly structured events that serve to reinforce Marshallese identity. Children are allowed to roam freely all night. Adults however, are expected to pray, as they do before and after any Marshallese event. There are formal dance performances, during which the older women in the hosting family spritz perfume on the dancers and or present them with gifts. There is always a cake cutting similar to cake cuttings at American birthday parties, except of course that the sheet cake is a massive rectangle capable of feeding a hundred or more guests. Gifts and money are exchanged. Guests to the *keemem* receive plates of food, cans of soda or bottled water, and additional unwrapped gifts such as hair and fashion accessories, candy, and blankets. The birthday child is showered with paper money by well-wishers in an organized procession. The family hosting the party usually wears coordinating outfits made from the same bolt of Hawaiian-print fabric. There are usually balloons and loud music. Sometimes there are T-shirts made with the child's photo. A big draw to a *keemem* is the food, especially if friends and relatives have traveled from the Islands expressly for the event, bringing with them their coolers full of fish. Regardless, there is always a huge amount of

food, served in huge portions, in Styrofoam take out containers or aluminum trays, until it runs out.

Vu and Voeks (2012) mention the important role of foodways in the rituals and customs that mark major milestones. For example, a tiered wedding cake in the US. At *keemems*, there isn't one symbolic food, even though Island foods are highly esteemed and sometimes the family throwing the party will order a whole roasted pig from Missouri. The true effect of the food lies in its overall quantity and composition. Here in Springdale, the more Marshallese foods the better, while in the RMI more imported foods may be preferred.

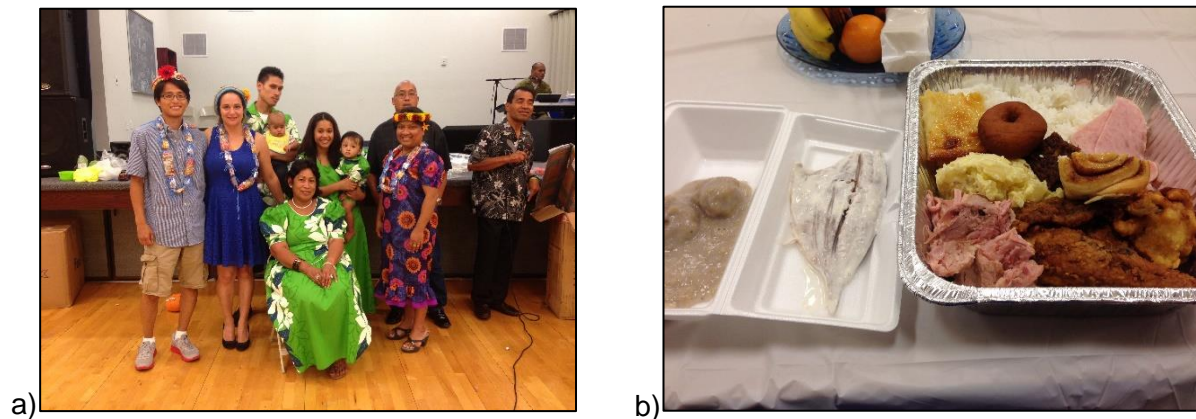


Figure 3.1. a) Attending a keemem, and b) A serving of food at the keemem

The Health of the Springdale Marshallese Community

The Marshallese community in Springdale faces many health problems, and some such as type II diabetes, do seem to be related to diet and culture. Almost all of the Marshallese people I met have at least an older relative being treated for diabetes related issues. It was an often-cited reason for travel between the RMI and Springdale.

METHOD AND THEORY

Mōñā eo kijōm ej kwalok wōn kwe (You are what you eat).

Marshallese translation of the English proverb attributed to the Frenchman Jean Anthelme Brillat-Savarin (b.1755 - d.1826)

This dissertation is a mixed methods research project, drawn from a variety of data collection and analysis techniques. In this chapter, I will discuss each of the quantitative and qualitative methods I used and my reasons for using them. I relied on cultural consensus theory and the quantitative methods of cognitive anthropology as well as post-colonial theory, symbolic anthropology, and qualitative ethnographic methods. First, I read and searched for themes in Marshallese stories (*bwebwenato*), oral histories, and prior journalistic and academic studies. Then I conducted my own food-centric semi-structured interviews with participants from the study community in Springdale. Next, I handed out surveys. And finally, I ended with the pile-sorting task. Bernard (2011) and De Munck (2009) were indispensable sources from which I sought guidance throughout this process.

Some researchers come to Northwest Arkansas (NWA) expressly to work with the Marshallese community in Springdale (Hirata, 2015; Klipowicz, 2016; Mitchell-Eaton, 2016). I started my Ph.D. program with the intent of studying ethnobotany. Ethnobotany is the academic discipline concerned with how people from different cultures make use of their local plants. The generations-old knowledge that people have about their environment is called Traditional Ecological Knowledge (TEK).

Not long ago, ethnobotanists always worked with relatively small indigenous groups in isolated locations. However today they may work in urban settings - even studying the behaviors of the dominant cultural group – because there are many different forms of TEK. In 2009 I had plenty of experience with botanical studies, but I struggled with the ethnographic methods. My advisor, Dr. Justin Nolan, helped me with the methodology for this project, and my

committee member, Dr. Jamie Baum, directed me to Springdale. At first it was hard for me to talk to people, but food is a wonderfully effective conversation starter. Because of my interest in ethnobotany, this project is necessarily focused primarily on plant-based foods.

Four essential and interrelated questions were addressed in this study:

1. What are the most important items that comprise the domain of traditional Marshallese foods?
2. How have Marshallese foodways changed or stayed the same across time and space?
3. How is knowledge about traditional Marshallese foodways distributed throughout the community in Springdale?
4. How do Marshallese people in Springdale use foodways to perform group identity?

My original proposal for this dissertation contained hypotheses in response to the above questions. However, as part of an effort to de-colonize the research I abandoned that overly scientific approach. I didn't want my conclusions to be influenced by any preconceived notions I had about Marshallese culture. So, I switched from deductive to inductive reasoning.

At any rate, my experiences growing up in the Baltimore suburbs would leave me hard-pressed to predict the contents of the domain of traditional Marshallese foods and their relative significance. While some domains have definite boundaries, such as the days of the week or the middle names of all the US presidents, traditional Marshallese foods is a more open-ended category. For the purposes of this work, the domain will be roughly defined by natural breaks in the free-list data.

Theoretical Background (Cognitive Anthropology)

The evolution of cognitive anthropology progressed from the cultural relativism of Franz Boas. The field of linguistics also contributed to the development of cognitive anthropology,

especially the work by Edward Sapir and Benjamin Lee Whorf (a follower of Boas) which showed that human thought is predicated on and guided exclusively by language (Whorf, 1941).

The movement to make anthropology more “scientific” (i.e. comparable, reproducible via standardized methods, and imbued with emic understanding) began in the middle of the last century. Founding fathers of this field, dubbed “ethnoscience” (aka the “new ethnography”), include Brent Berlin, Harold Conklin, and Charles Frake. They strove to understand what went on inside the minds of their informants, their food classification systems for example, and other manners of categorization and reasoning related to natural resources.

One of the ways they set out to accomplish their goal of thinking “like a native” was through focused analysis of specific domains, or “native conceptual categories (p.361)” (McGee and Warms, 2008). Every culture uses categories, and they are universally able to apply logic in doing so (D’Andrade, 1995). Conklin (1955) examined the color terms and categorization of plants used among the Hanunóo of the Phillipines (McGee and Warms, 2008). Frake studied “both the esoteric and the mundane in his works on ecological systems, interpretations of illness, concepts of law, how to enter a house, and how to ask for a drink in the Subanum, Yakan, and other cultures of the Philippines... (Barnard, 2000:117-118).” Other ethnoscientists analyzed kin terms (Lounsbury, 1956; Goodenough, 1956) and diseases. Many of them studied ethnobotanical domains such as types of firewood (Metzger and Williams, 1966) and Tzeltal plant names (Berlin et al., 1973). Cognitive anthropologists have visited Micronesia as well, most famously Lutz (1982), who explored the domain of emotional language on Ifaluk Atoll (an island in the Federated States of Micronesia). As for the RMI specifically, Barker (2013) touched on culture and cognition in her study of the language of nuclear testing survivors, although she did not use the same types of methods that I will describe in this chapter.

Domains have an internal structure that governs how items within them are related (Borgatti and Halgin, 2013). For example, in the American English domain, days of the week, Saturday and Sunday are more closely related (because they are both weekend days) than

Saturday and Wednesday. Based on the efforts of the ethnoscientists to explore the content of various domains, beginning in the late 1960s researchers realized they could use similar methods to understand the thought processes of other people. Thus was the field of cognitive anthropology born (D'Andrade, 1995). One of the most famous early cognitive anthropological studies, of interest to ethnobotanists, was James Boster's 1985 study of the folk botany of the Aguaruna Jívaro, an Andean group. Using data on the identification of manioc (*Manihot esculenta*) varieties, Boster concluded that *expertise correlates with consensus*. Taken all together, cognitive anthropology studies revealed that there are some universal patterns found in folk taxonomies, or traditional methods of categorization, and that these patterns are strikingly similar to Western scientific rankings – although the reasoning behind the placement of items may differ between groups (Berlin et al., 1973; Ross and Revilla-Minaya, 2011).

For the most part, even the early cognitive anthropologists didn't think that a certain (Western) manner of thinking was necessarily superior to that of any other culture. They were in a way, an unusual form of cultural relativists, though committed to empirical data collection (Wolverton et al., 2014). Furthermore, their research showed that folk biological knowledge was even more precise and complex than Western scientific knowledge of some domains (Ross and Revilla-Minaya, 2011). Yet, some questions raised by Lévy-Bruhl's 1930s books on "primitive thought" linger, causing some researchers to wonder still today whether there is a primitive form of cognition hidden deep within the human brain (Barnard, 2000).

Frake (1962:54) wrote, "A successful strategy for writing productive ethnographies must tap the cognitive world of one's informants." Cognitive anthropological methods have since informed research in various subfields of cultural anthropology from environmental to medical. McGee and Warms (2008) compare contemporary cognitive anthropologists to evolutionary psychologists, researchers who study how past adaptations of the human brain give rise to the mental traits of today's people. Ross and Revilla-Minaya (2011) point out that there could be evolutionary differences in thought between people belonging to different cultural groups,

although they disdain the term “cultural differences” because they feel it is circular. However, I believe it is surprisingly appropriate given my own experience.

“Where culture seems to have its greatest effect,” according to D’Andrade (1995:217), “is on semantic memory and complex reasoning.” Semantic memory refers to general domain contents that are typically picked up from indirect experience such as color terms, band names, dog breeds, perhaps for me even the names of the islands within the RMI. Complex reasoning is in part the ability to predict the behaviors and relationships of items. For example, if Yorkshire Terriers and Jack Russell Terriers are both breeds of terriers, one might expect them to share both the high-strung personality and the wiry fur of terriers, although they are different sizes. Similarly, even though I’ve never been to the RMI, if you told me that Namdik Atoll and Jālooj Atoll are both in the southern part of the Ralik Chain archipelago, I would expect that bananas would do well on those atolls, which is true.

Today, cognitive anthropologists are still interested in the domains of folk biology and associated foodways, the indigenous beliefs about food palatability and edibility (Shepard, 2004). Recent work includes Quinlan et al.’s (2002) study of medicinal plants in Dominica. Balée and Nolan’s (2015) study of Ka’apor forest types also serves to illustrate this. The two main reasons for the popularity of ethnobotanical research are the great importance of food resources (in management and conflict), and the equally great respect for TEK (in transmission, loss, distribution). Arun Agrawal (1995) famously pointed out the irony of the Western fascination with TEK. Firstly, he compared the intellectual separation between TEK and “Western scientific knowledge” to the racially-tinged writings of early anthropologists concerned with “primitive” cultures. Although this is a good point and I agree that wisdom is wisdom, wherever it comes from, I believe that it is useful to have the term TEK. When I use the term, it is not to be racist, but to have, in a way, affirmative action. Much of the wisdom from the non-Western world has been overlooked or scoffed at in the past, as Agrawal himself admits. It deserves now to be appreciated. Agrawal also presciently discusses the efforts of those

engaged in sustainable development to work TEK into their plans. Like most forms of knowledge, the usefulness of TEK is dependent upon the environment. This is very apparent in constructing dietary guidelines, as it has now been established that traditional diets are healthy – for people who can trace their genetic ancestry back to a certain geographical region. For example, the Mediterranean Diet (olive oil, fruits and vegetables, seafood, ...) is hugely popular in the US, yet it doesn't make a lot of sense outside of the Mediterranean region where the environment lacks olives and seafood yet the people have access to other fine sources of omega-3s such as hickory nuts.

Personally, I identify with and espouse the close link between cognitive anthropology and other disciplines rooted in human thoughts, belief, and behavior, especially medical anthropology and psychology. My father is a psychiatrist and I have particularly enjoyed the banter exchanged between our intellectual frameworks. The only problem in integrating cognitive anthropology with different fields lies in different methodologies (Ross and Revilla-Minaya, 2011). A final critique of cognitive anthropology is that earlier studies focused on knowledge, and later studies focused on cognition, but in reality there is a need for studies that focus on both. That is because there may be cultural differences in information processing. For example, think of the common cultural differences in counting (Ross and Revilla-Minaya, 2011): Some cultures have no concept of zero, some count(ed) by tens, and others by 60.

Symbolic Anthropology

Yet another branch that stemmed from ethnoscience, cognitive, and interpretive anthropology is symbolic anthropology. While the symbolic anthropologists agree with the cognitive anthropologists about the need to think about culture from an insider's point of view, they denounce the use of overly structured mathematical methods. Instead, symbolic anthropologists prefer description. One of the fathers of symbolic anthropology, Clifford Geertz (1977), is famous for what he termed "thick description", a careful analysis of each level of

meaning that is carried by a given symbol. Proponents of symbolic anthropology compare it to poetry, whereby the essence of social belief is rendered meaningful in artful forms of expression. Critics generally complain that in describing and interpreting the scene, the anthropologist may make errors based on her status as a cultural outsider, like a translator who *ad libs* (Colby et al., 1981).

Cultural Consensus Theory

The idea that knowledge is distributed (both within and outside of the brain of an individual) is both an obvious and a profound statement. Of course no one person can possibly know all at once everything that they will need to know to be successful. Therefore, we rely on other people, art and artifacts, institutions, symbols, and the internet. The idea of distributed cognition as it exists today is based in psychology (such as Wilhelm Wundt's 1921 epiphany that a single person cannot create a language) but owes much to the field of anthropology (Cole and Engeström, 1993). Boyd et al. (2011) write that the great human achievement of rapidly colonizing more of the Earth than any other land-based organism is due to our distribution of complex information (ex. how to build tools) across generations – and specifically our ability to learn from others. Souto and Ticktin (2012) showed how three factors that can influence the types of TEK held by people within a cultural group are age, gender, and origin. I used the same three demographic variables to look for cohesive and revealing patterns in my data.

If culture is constructed of “the learned values, beliefs, and rules of conduct shared to some extent by the members of a society that govern their behavior with one another (Bonvillain, 2006:479)”, then it follows that culture is also distributed differentially and meaningfully among members of any study population. Furthermore, like knowledge, culture is distributed unevenly. Individual members of a group usually have their own specific set of knowledge, especially if the knowledge pool is deep. For example, psychiatrists and cardiac

surgeons are both trained in medicine, but their areas of expert knowledge are vastly different. The patterns of decision-making assessed by cognitive anthropologists are called schemas (Geertz originally proposed the term “control mechanisms” to describe the same concept (Cole and Engeström, 1993)). Schemas can serve as the blueprints for any aspect of culture from ideas (e.g. love) to material objects (e.g. an apple). After all, cognitive anthropologists point out that material objects are just ideas that have manifested (e.g. a wedding ring represents the idea of love). Inferences and attributions are the effects of “psychological distance” on the processing of schemas (Ross and Revilla-Minaya, 2011).

Culture is distributed across time as well as social space, a fact that has consequences for learning and knowledge transmission. As D’Andrade (1995:208) points out, “The simple point is that most people are smart because someone taught them the right models.” It’s a good thing then that humans are social animals because they need to be around others who can teach them things. Even in a small group, there can be a great deal of variation in cultural knowledge. In the RMI for example, where atoll communities numbered in the hundreds, most people probably had knowledge about edible plants, but only a select few would have known about using plant-based medicines for healing.

The problem then, for anthropologists studying an unfamiliar culture, is that different respondents will tell them contrasting, and often conflicting things. Data collection depends on how much about the culture is known by the informant and any biases present. Enter the Cultural Consensus (CC) Theory, a mathematical model that shows how and to what degree a group of people share beliefs. The CC Theory was partly inspired by Boster’s work in the Andes. The model begins with the statistical probability that an informant gives the researcher a correct answer. Next, the probability of the answer being correct is based on the number of people who independently agree on it (Romney et al., 1986). Two important results of CC are that cognitive anthropologists can generate a kind of average pattern of a cultural group, and that they can view other patterns in subgroups (Ross and Revilla-Minaya, 2011). People who

agree with the group's average responses are more likely to answer the same if asked twice (they're reliable), are more likely to preserve item rankings (they're consistent), are faster to answer, and are generally smarter (D'Andrade, 1995).

Theoretically then an anthropologist doesn't need a huge sample size, only to collect information from the "right" people, called "culturally competent" people. A person is culturally competent if they can repeatedly give the same answer as most other people would when asked (in the least formal sense of the theory) (Weller, 2007). In the broader literature, the term "culturally competent" is sometimes also used to mean "culturally sensitive". However, in this dissertation, I will only use the term "culturally competent" in the context of CC theory.

In order to analyze cultural consensus, one makes three assumptions: First, that the data belong to an identifiable domain so that all of the questions have the same level of difficulty. Secondly, that there is a culturally correct, truthful answer to any question concerning that domain. And finally, the data must be independent – no one cheats by copying another person's answers (Romney et al., 1986; Garcia De Alba Garcia et al., 1998).

Post-Colonial Theory

Post-colonialism is a part of the post-modern theory of anthropology (self-aware, anything goes) that is concerned with power dynamics (Barnard, 2000). It refers to efforts to emancipate people who have historically been politically subjugated, displaced, and discriminated against from the on-going process of cultural hegemony. That is, the prefix "post" doesn't necessarily mean that the "colonialism" is a thing of the past. Rather, the post-colonial state is one of hybridity somewhere in-between the imagined idyll of the ante-colonial period and cultural renaissance. As Ashcroft et al. (1995:184) write, there is "continued mutual development of independent traditions."

The characteristics of post-colonialism (power differentials, cultural hybridity, etc.) are present starting at first contact (Ashcroft et al., 1995). Mudrooroo (1995) compares the global expansion of European people, culture, material goods, and diseases that began in the fifteenth century to a flood. Like a tidal wave, Europeans quickly and forcefully swept across the globe. They overpowered the people who were occupying even remote regions such as Micronesia. Mudrooroo goes on to compare the loss of indigenous culture and power to the feeling of drowning. This analogy is prescient in the case of the RMI where the unmitigated non-renewable energy consumption of Westernized nations is causing a literal flooding of the Islands and a real threat to the Marshallese people. Expanding on Crosby's (2004) idea, the problem of sea level rise in the RMI is one of a total environmental imperialism.

The whole of Micronesia including the Marshall Islands was named by European explorers, the gentle Pacific pronunciations glossed into English over time. "To name the world," Ashcroft et al. (1995:283) maintain, "is to 'understand' it, to know it and to have control over it." Languages, especially names, are key in assigning power.

The RMI is a post-colonial nation in the political-historical sense. "The United States may well be the first nation in history to realize that it has been an empire only as it ceases to be one. Americans are less disturbed by the idea of imperial decline than with the notion that the word 'empire' could ever apply to us (Mitchell, 1992:475)." US colonial rule of the Marshalls took a different form than traditional European colonialism that was a means of acquiring resources, including slave labor. However, the negative impacts left on the collective soul of the Marshallese people by US rule are still felt in the current generation, both in the RMI and in Springdale.

Ashcroft et al. (1995:183) view nationhood, the creation of "a shared community based on myths of racial/cultural origin", as a formal resistance of colonialism. Anthropologists are interested in those "myths", the shared differences of group members that facilitate nation-building. Post-colonial anthropologists must attempt to balance this emphasis on mythology

with an equal awareness of the power it contains. Of course culture is dynamic and notions about what constitute authentic components of culture are relative and subject to context. In 1989 the English Professor Margery Fee asked a simple question concerning authenticity: "Who can write as Other?" The answer is complicated. While a few extreme purists believe that all stories belong to those who experience them first-hand, who can tell them in the original language, most people today acknowledge that strict rules about who can write ethnographies would severely stall the progress of anthropology as a field of study. It is the duty of the post-colonial anthropologist, if such a title is not an oxymoron, to de-colonize her work as much as possible. Miller (2010) notes a few of the features of de-colonized Marshallese Studies: Firstly, such research must be undertaken with respect. It should serve some greater purpose, determined by the study community. The research should not be separated from the community. And finally, there must be opportunities for community members to submit questions and comments. Still, the work will continue to exist as a hybrid entity. For example, this work is itself a hybrid entity because although it deals with Marshallese foodways and culture, it is written in the English language.

It is also important to look at the patterns of production and consumption of anthropological literature. If I am writing for an academic audience, this work veers more toward the colonial than if I write in a manner accessible to a broad audience that includes as many Marshallese people as possible. Most of the existing literature on Marshallese Studies has been written by non-Marshallese scholars. One reason is that prior to the arrival of missionaries in the Islands, there was no written form of the Marshallese language.

The long hours spent pouring through pre-existing literature and analyzing new data are now threatening me with "expert" status given the subject of Marshallese foodways. However, I lack the hereditary lived experience of a true cultural insider. I don't want to offend any Marshallese people by telling a story that is not mine to tell. Rather, I strive to use my newly acquired knowledge for the purpose of mediating between the Marshallese culture and that of

the US in general. I believe that is the benefit and the main point of producing a hybrid work such as this one.

Since researchers not know ahead of time who are the most reliable, or “culturally competent” (Romney, Weller, and Batchelder, 1989) members of a group, Handwerker (1998) recommends talking to anyone who is willing to open up. I used snowball sampling to recruit respondents. In this process, I relied on community leaders, friends, and random acquaintances in the tightly knit Marshallese community in Springdale to recruit their friends and families for data collection.

Data Collection

Interviewing

I conducted 32 semi-structured personal interviews. About half of the interviews were conducted in English, and half were conducted in Marshallese with the assistance of a translator. Interviews consisted of 16 questions and were digitally recorded. Most interviews were conducted in people’s homes. The others were conducted in the public settings of a restaurant, the Springdale public library, or the park outside the library. The interviewees were compensated \$20 cash for their time.



Figure 4.1. Interviewing community elders in their home

Surveys

In designing my surveys, I followed the advice of De Munck (2009), even down to printing the surveys on green paper. I don't know if that trick works across cultures but I figured it couldn't hurt. A few other random tips I used from De Munck (2009) were wearing a blazer and using metal clipboards. I got back 116 surveys, although not all of them were entirely completed. The main thing I wish I had done with the surveys was included a field for the length of time spent in the US.

There was an obvious pattern, steered in a positive direction, among survey respondents. Other researchers working with the Marshallese community have reported a similar result. One health worker in Springdale claimed that Marshallese patients who were obviously suffering would still answer cheerfully when asked how they felt today.

Surveys were conducted at the Marshallese Consulate in Springdale, the office of the Arkansas Coalition of Marshallese (ACOM), in the same building, and at three different Marshallese churches. In addition, I had a few friends fill them out in informal settings. All participants had a choice of either taking the survey in English, or translated into Marshallese. I enjoyed collecting the surveys in person because I like to mingle socially. It was fun to personally hand out the interview incentives – T-shirts I designed with the help of my Marshallese friends and a student graphic artist at the UARK. Also, I felt like my physical presence, and that of the friends who helped me collect the surveys, sort of pressured respondents to actually complete the survey. That being said, I wonder what the results would have been like if I had made the survey accessible online, especially through Facebook. Facebook has a considerable number of Marshallese users both in the RMI and abroad. It seems like it might be a good way to reach a lot of people, however, I have no idea what the response rate would be.



Figure 4.2. Collecting surveys at the Consulate General of the RMI in Springdale

Free-listing

Weller and Romney (1988:16) suggest that free-listing be the first step “in all research involving the definition of new domains.” In the Western academic literature, “Traditional Marshallese food” can be considered a “new” domain. Free-listing is a very simple task. It involves asking participants to write down or say all the things that come to mind as belonging to a specified group. Usually, the task is timed for a relatively short period. Cognitive anthropologists have had much fun with this procedure, examining domains such as “bad words” (Borgatti and Halgin, 2013), “loathsome animals” (Nolan, 2007), and “romantic love” (De Munck, 2009). The benefit of free-listing is that it is easy and yields surprisingly rich data. It elicits emic responses and disallows biases. And of course, it generates a large amount of rich data relevant to culture and thought. One major downside to free-listing however, is that “there are no generally recognized ways to check the statistical reliability of the free listing task (Weller and Romney, 1988:16). Another issue is that the leading free-listing analysis software, ANTHROPAC, is an ancient MS Dos program that is not compatible with all new computers. I was able to run the program on my laptop with the help of another program, DOSBOX, but the process was not without headaches.

Fans of free-listing follow five main assumptions (Balée and Nolan, 2015). The first assumption is that respondents will usually first give the names of the items in the domain that they are more familiar with. In the “Shoes” example (Table 4.1), Respondent #2 works in a corporate office where pumps are commonly worn.

The second assumption, called Zipf’s Law, is that those items listed first will be prototypical for the domain, and also general and composed of fewer words. This can be seen in the “Shoes” example in the first items listed by respondents #1 and #4. Furthermore, items appearing last on free-lists are usually specific types of items, described by multiple words, and/or only a few people are familiar with them. Indeed, in my example, the “Gladiator Sandals” and “Rain Boot” that are last on the lists of respondents #3 and #4 respectively, are specific types of shoes (sandals, boots) which might also be subsets of the generic items, “Heels” or “Flats”. Additionally, the last item, “T-Straps”, listed by #2 was not listed by any other respondent. This might indicate that the other women have no knowledge of that type of shoe, or of that term for it. Certainly, outside of this tiny sample group, I would suppose there are many (male) English speakers who are unfamiliar with “T-Strap” shoes.

The third assumption made by free-list aficionados is that the items listed first are commonly found in the respondent’s local environment. All four of my sample respondents live in temperate North America. If they were from the Arctic, it’s more likely they would list “Boots” and such items above “Flip Flops”. Likewise, if they were from the RMI, I’d expect them to list “Flip Flops” before “Boots”. This phenomenon might not be as evident in types of shoes as it would be for types of say, types of plants or animals, which are more regionally variable.

The fourth assumption of free-listing is that experts are able to think of more items than novices. Out of the friends in my sample dataset, #4 seems to have the most knowledge of shoes. Respondent #1 appears to have the least knowledge of the domain (or rather, she has the perception of a habitual online shopper, listing the major categories of shoes that one typically sees broken down on various websites). Finally, we must assume that all of the

respondents are part of the same cultural group and that they speak the same language. Some researchers also believe that if the sample size is large enough any items listed by only one respondent (what is a “Rider Boot”?) can be ignored (Balée and Nolan, 2015).

Table 4.1. Sample free-lists collected in American English for the domain “Shoes”

#1: Female, Age 24	#2: F, 29	#3: F, 38	#4: F, 27
Item #1. Heels	1. Pumps	1. Mary Jane’s	1. Flats
2. Sneakers	2. Fashion Sneakers	2. Combat Boots	2. Flip Flops
3. Boots	3. Boots	3. Flats	3. Sandals
4. Flats	4. Booties	4. Hiking Boots	4. Hiking Sandals
5. Slippers	5. Flip Flops	5. Wedges	5. Hiking Boots
6. Wedges	6. Sandals (Flat)	6. Flip Flops	6. Water Shoes
	7. Sandals (Heeled)	7. Tennis Shoes	7. Sneakers
	8. Wedges	8. Clogs	8. Hi-tops
	9. Hiking Boots	9. Stilettos	9. Pumps
	10. Running Shoes	10. Snow Boots	10. Stilettos
	11. Clogs	11. Moccasins	11. Wedges
	12. Peep Toes	12. Gladiator Sandals	12. Booties
	13. T-Straps		13. Rider Boot
			14. Snow Boot
			15. Rain Boot

This technique reveals how people situated within a cultural group think about and classify their surroundings. It can also be used in comparing how different groups think about the same domain. For example, Boster and Johnson’s (1989) study on novice and expert fishermen. Or a researcher can collect multiple free-lists from the same group to compare how people think about different domains. An example of this is Balée and Nolan’s (2015) work on Ka’apor forest types. Free-lists can also reveal peoples’ emotions about a domain and the items contained in it, as Nolan and Robbins (2001) showed for animals. In addition, free-lists are not limited to simple recall of items that are considered part of a given domain. Several researchers have collected free-lists of brief responses to questions about prison conditions

(Fleisher and Harrington, 1998) and why students don't take anthropology in college (Flinn, 1998). Analyzing longer responses may require the additional step of coding the free-list data before it can be run through ANTHROPAC.

Food has been declared "a distinctive core domain" (Shutts et al., 2009:121) meaning that people learn very early in life the rules that include or exclude items in it. Unsurprisingly, this is not the first study to use the free-listing method for food. Muller and Almedom (2008) collected 20 free-lists for their comparison of traditional and famine foods in Boumba, Niger. Libertino et al. (2012) claim they were the first to apply saliency measures (Smith's S and Sutrop's CSI) to the domain of food in their study of menus free-listed by 200 Argentinian women. Food is a very personal subject. While Quinlan (2005) notes that the free-listing method is different from simply administering surveys because it does not directly ask anything about the respondent, she concludes that personal perspectives are often obvious in free-lists anyway.

In my research I used the prompt, "Please list all the traditional Marshallese foods you can think of." The same prompt was used during interviews, on surveys, and in conversation with friends for a total of 34 verbal and 116 written free-lists. Although my two data sets contain the same type of data, it would not be statistically correct to combine them. Fortunately, they show similar patterns.

I cleaned all the data by eliminating duplicate answers in individual lists, translating English words into Marshallese where appropriate, and standardizing spelling, pluralization, capitalization, and binomials. In the case that the same dish is known by more than one term, as can happen in the RMI between the Ralik and Ratak archipelagos, and between different atolls, I used the term from Abo et al. (1976).

I don't believe I collected all of the items that belong in the domain of traditional Marshallese foods. I know this partly because the dictionary (Abo et al., 1976) has some other terms, and also because in general, free-listing is not the best method to use to take an

exhaustive inventory of a given domain (Quinlan, 2005). However, this kind of project isn't about just the content of the domain, it's also about agreement on the content, and I found that agreement among respondents to be robust.

Pile-sorting

Take the top 20 or so items from the results of the free-listing task, write down the items or attach pictures of them to 20 separate notecards, and you are ready to administer the pile-sorting task. For this activity, participants are asked to sort the cards into different piles. They may create as many (or as few) piles as they wish (for an unconstrained, single sort task such as I used). Some benefits of pile-sorting are: It's easy (if the cards have pictures, even little kids or others who don't read can still do it). Also, it can get people talking. Of course, as Roos (1998) cautions, doing pile-sorts with food terms is not a food-related activity so it must be accompanied by other forms of research such as participant observation. Weller and Romney (1988) write that a downside to pile-sorting is that it requires a sample size of 20 or so respondents. I did not have trouble finding 20 people to perform the pile-sort, but I can see how in some cases that might be difficult, such as when time is a limiting factor. I used 22 items in my pile sorts with 20 respondents. As an incentive, each respondent was offered a candy bar (ironic, I know, for a study about traditional foods).

Participant Observation

I didn't travel to the RMI. I didn't even live in Springdale. I commuted the 20 minutes to and from the comfort of my home in Bentonville, AR. This project would have been even better if I had conducted similar research in the RMI and compared those results to what I found here. It also probably would have been better if I could have integrated more into the community in Springdale. I enjoyed working with them, and I am happy that I made some good friends, but I am still an outsider there even after spending several years going around talking to people, attending functions, and volunteering. Other young researchers were able to arrange home

stays, which seems very helpful. Most of all, the language barrier was huge. I learned a few Marshallese words and phrases, but I cannot speak the language even as well as a Marshallese toddler. Many people in Springdale have an equivalent command of English, so unfortunately our communication has been sorely limited. If I had the time to do this project over again, I would definitely learn more Marshallese. The biggest expense of this project was paying translators for their time and services. If I do end up staying in NWA, I will probably continue to study Marshallese so that I can be of more assistance as a volunteer in Springdale.

A study about food requires eating, and that I did plentifully. My stomach was a willing participant in this research. In homes, at events, in the parking lots in front of the Marshallese grocery stores, I tasted as much Marshallese food as I could. In general, I'd say Marshallese food is on the sweet side. However, don't bite into a Marshallese donut or cinnamon roll expecting the sugary taste of American baked goods. I honestly liked most of the foods that I tried. The one exception might be the red gummy bears soaked in what I think is artificial sour plum flavoring, a ubiquitous kid's snack. Aside from that overly sticky candy, what's not to love about Marshallese cuisine? There's usually lots of grilled meat marinated in soy sauce, a heaping of starchy carbohydrates, maybe some salty fish, and everything is sweet and slightly coconut-flavored. Just thinking about a plate of Marshallese foods makes my mouth water. But as much fun as participant observation is, Miller and Deutsch (2009) caution the researcher to remember that her presence affects the dynamics of the even she is observing and that she will be unable to observe all aspects of her research directly.

Analysis

Quantitative Analyses

I used ANTHROPAC 4.983 (Borgatti, 1996) (in tandem with DOSBox 0.74) and UCINET to analyze the free-list and pile sort data. I also used Microsoft Excel to explore the free-list and

survey data. For the CC model I followed De Munck's (2009) instructions. Weller (2007) claims that most statistical packages are adequate. I used Excel and R to run my statistics.

Consensus

Consensus, or "domain specific cultural competence" (Bernard, 2011: 371) can be measured by calculating the average response to each question and following up with a statistical test (binomial or chi-square) to be certain there is or is not a difference (Weller, 2007). If there is a significant difference, the greatest average response is considered the culturally correct answer. Consensus is not a quality that can be measured for data in the form of free-lists, unless they are scaled down to a yes/no format. The analysis is typically performed on interview, survey, or triad/sentence-completion responses. I used my survey data.

Salience

Cognitive salience measures the degree to which respondents agree and prioritize an item. It is therefore a function of frequency of mention, F, and rank order in a set of free-lists. ANTHROPAC calculates salience as Smith's S. Last year (2017) my colleagues and I developed a new improved method for calculating cognitive salience, B', using some of my Marshallese data as an example. B' ranges between 0 and 1, with higher values indicating greater cognitive salience. For example, using the "shoes" data presented above, I can begin computing B' by determining F (Frequency of mention) for each of the 29 shoes mentioned. Microsoft Excel is useful for keeping track of the numbers if the data set is much larger than my four free-list example, and for performing the rest of the calculations. Of course, before doing anything to analyze free-lists, they must be "cleaned". The cleaning process involves eliminating duplicate items in the same free-list and ensuring agreement between free-lists by pluralizing or de-pluralizing where needed and choosing a standard synonym. For the "shoes" example, I believe that "tennis shoes" is a common synonym for "sneakers". I also pluralized the last three types of boots listed by Respondent number four.

B is a measurement similar to the percentile rankings used by pediatricians and college entrance exams. It is calculated for each item in the list by taking the total number of items in the list and subtracting the rank of the given item, then dividing by one less than the list length. For example, B(slippers) in the free-list from Respondent number one is $= (6 - 5) / (6 - 1) = 0.2$. That means that in that particular list, “slippers” only precede 20% of the items listed. After cleaning the data and determining the frequency of mention of each term, the next step is to calculate B for each item within each list and then add up, or sum, all the B values for each item across all the lists. Finally, to get B' for each item, the sum of the Bs is added to one less than F. Then that quantity is divided by one less than twice the number of items. For the top five most salient shoes in my example, the results are presented in Table 4.2. Since I had 29 total items, I divided the sum of the Bs for each item plus one less than the frequency of the item by 57.

Table 4.2. B' values for the five most salient shoes

Rank	Item	B'	Σ(B)	F
1	Wedges	0.076	1.35	4
2	Flip Flops	0.075	2.27	3
3	Flats	0.074	2.22	3
4	Sneakers	0.067	1.82	3
5	Hiking Boots	0.066	1.74	3

Clustering

I used ANTHROPAC and UCINET to analyze the pile sorts for Multi-Dimensional Scaling (MDS) and clustering patterns among items and respondents. In general, pile sorts reveal more about the clustering of items than they do about the way respondents think alike. ANTHROPAC uses math to calculate the “distances” between items and therefore generate the clusters, but Bernard (2011) notes that interpreting and correctly labeling the resulting clusters is up to the anthropologist.

Semantic category clustering, C, in the free-lists was examined using the methods of Robbins and Nolan (2000). Clustering in free-lists represents the similarity of sequential items. I explored clustering in my free-lists (in individual lists and overall for the 2 data sets) using the 5 major groupings revealed by my pile sorting analysis. “Strong cluster scores for any designated subset generally indicate high cognitive and cultural salience (Balée and Nolan, 2015).” Basically, they can show patterns in the data that have persevered through time and are therefore worth studying.

Qualitative Analyses

Ethnography

Ethnography by definition just means writing about other people. The implication is that the writing be very descriptive – thickly descriptive as Clifford Geertz would say. Or as my advisor would say, like an angel food cake, very fluffy with expression. Ethnography commonly relies on participant observation and interviews (Miller and Deutsch, 2009). The most important characteristic of this dissertation is that is accessible. I chose to make it an ethnography so I could include as many details as possible in order to capture the interest of all stakeholders (community members, colleagues,...). My observations and ideas are all influenced by my past personal experiences, and idiosyncratic thought processes. Therefore, some biases, contradictions, or even things that are straight up wrong may be present. Most anthropologists accept those issues as par for the course. “A successful strategy for writing productive ethnographies,” writes Frake (1962:54), “must tap the cognitive world of one’s informants.” According to Frake, even an everyday plant or object can’t be simply identified as such. Instead, the emic rules for identifying the object must first be explicitly stated.

With the increased presence and sophistication of technology, many ethnographies today are multi-media. Ellen (2006) reminds us that writing alone is not enough to fully describe

an environment, or the plants therein. To that end, I will include photographs in this dissertation. I did not actively take very many pictures of people - only food - because that seemed less intrusive. But I have borrowed some additional photos from my friends to include here where appropriate. I wish I could insert music into this book too, but readers will have to settle for the transcriptions of song lyrics without their accompanying tunes.

Text Analysis

To organize and explore themes in textual data, I used the program NVivo 11 Pro. First, I looked at the responses to my interview questions. I then included two oral histories collected by the Marshallese Educational Initiative (MEI) for their Marshallese Oral History Project (MOHP), which they were kind enough to share with me. Finally, I entered notes from collections of Marshallese folklore.

Word counts and semantic network analysis are two initial text analyses methods that can be performed by NVivo. While these methods are useful for singling out key themes and making comparisons between groups, they don't reveal much about the innate emotion of the text.

As great as NVivo is, Lofland et al. (2006) caution that the researcher(s) of any anthropological project should be the primary analyst – not a software program. Thank goodness I didn't have a huge sample size for my interviews. NVivo really helped get me started with coding, a task with which I had no prior experience. Anthropological coding consists of labeling bits of data that seem to go together. For example, if I were to try coding the data from my current Facebook newsfeed, some labels, or codes, that I would make would be "cute cats", "disdain for the president", and my uncle "Robert's birthday". Then I would sort the posts into those categories. The initial step of coding asks open-ended questions such as "What is this (an example of)?" However, subsequent more focused steps weed out less

descriptive codes, leaving ones upon which the researcher can form conclusive ideas (Lofland et al., 2006).

Feedback

For this project, I wanted to use a writing style I encountered in Harbottle's 2000 book which incorporates feedback from the study community into the project. The major limitation of this method is again, language. Many Marshallese speakers in Springdale have only rudimentary English. In addition, there is an English saying that goes something like, "Too many cooks spoil the soup." I can't include all of the feedback I receive due to practical matters like time and academic matters like scope.

THE FOODS

“I think our foods are special to our culture and tell us who we are.”

Male, 27 years old, from Namdik Atoll, RMI

The purpose of this chapter is to describe the food (and beverage) items discussed in this dissertation so that readers have a general understanding of why they are important to Marshallese culture.

Foods (in alphabetical order)

Baañke, pumpkin (*Cucurbita pepo*)



Figure 5.1. Ripe green pumpkin (on vine) on Ar̄o Atoll, photo by Charmaine Burrus

Pumpkin is an important supplementary food plant in the RMI (Thaman 2008), where it is grown in home gardens. It is a good source of the phytochemical beta-carotene (Liu, 2012). Unlike most of the other plants described in this chapter, pumpkins can be grown here in Springdale. The variety of pumpkins commonly grown in the RMI have an outer skin that remains green when ripe (M.Waldron, 2015, personal communication). Other cucurbits such as watermelon (*Citrullus lanatus*) are also commonly grown by Marshallese people in their home gardens in the RMI, and in community gardens in Springdale.

Bao, birds

The word *bao* means “bird” in Marshallese. Before the influence of Western culture, Marshallese people ate some local sea birds and their eggs. Geese, ducks, and turkeys can all now be found in the RMI (Nakano, 1983). In the RMI today turkey tails have also become popular. They are a poultry industry by-product for the poorer market. In Springdale chicken is a go-to protein in most Marshallese households.

Bōb, pandanus/screwpine (*Pandanus fischerianus*)



Figure 5.2. a) *Pandanus* fruit photo by Amy Eisenberg, b) *pandanus* keys (intact on left and chewed on right) photo by Charmaine Burrus, and c) boy chewing *pandanus* key in the RMI

Pandanus is a relatively short tropical plant (< 8m/27ft) compared to breadfruit and coconut trees. However, what it lacks in stature it makes up for in production, bearing very large (~1m/3ft long) fruits. These fruits (syncarps), which resemble gigantic pineapples, are aggregates of about fifty pie-slice shaped “keys” (*wud*/phalanges). Until they ripen, the keys are green, but they turn a vibrant orange when ripe. The outsides of the keys remain tough, but the tips of the ripe keys are juicy. People use their hands to squeeze (*kilok*) the juice out into a coconut husk bowl. The resulting liquid is considered a good food for babies and sick people. The orange ends of the keys can also be eaten fresh (the action of chewing on the fibers helps

brush the teeth). "Toddlers sat and sucked the sweet ends like pacifiers, getting stringy fibers stuck between their teeth (Rudiak-Gould, 2009:86)."

Pandanus seeds are also edible. The seeds of pandanus fruits may grow into trees of the non-edible variety, so the trees are cultivated by slips taken from an edible variety (Pollock, 1992). Pandanus trees are grown in agricultural areas such as near taro pits, or in home gardens. Wild pandanus is called *erwan* (not *bob*) (Taafaki et al., 2006). In March 2003, the late botanist Lois Englberger was able to purchase 13 different varieties of fresh edible pandanus on Mājro Atoll at roadside stands, shops, and farms. Ten out of her 13 (77%) had vitamin A levels high enough to combat deficiency (Englberger et al., 2006).

Pandanus season is opposite to breadfruit season, occurring in the "winter" months. Pandanus is native to the Marshall Islands (Thaman, 2008). The Marshallese name for pandanus is *bōb*. According to Pollock (1992), it is a primary food source in the Marshall Islands. Thaman (2008) calls it one of the "trees of life" of the Marshall Islands (p.33).

Pandanus trees are featured in several *bwebwenato* (Marshallese folktales) (Englberger et al, 2006). "*Liok tūt bok*" is a *jabōnkōnnaan*, or Marshallese saying, about pandanus. It recalls how the pandanus tree roots deep into the sandy soil. This fact reinforces the importance of a good beginning or a strong foundation, so that a person or endeavor may be successful (Miller, 2010:74). Pandanus trees are indeed admirable. They can withstand relatively dry and salty conditions (Thaman, 2008). Even though pandanus trees are hardy, Marshallese people still take good care of their trees. One common pandanus arboriculture practice is mulching (Thaman, 2008).

The common name for *Pandanus odoratissimus* and *Pandanus fischerianus* is "screwpine". However, these Seussical-looking trees and their large fruits are known throughout the Pacific simply as "pandanus". Pandanus may have originated in Southeast Asia (Pollock, 1992), where the leaves of related plants are a popular flavoring. Many varieties of pandanus are cultivated in the RMI, mostly on the Outer Islands. Englberger et al. (2006:485)

notes that there are more than a hundred named cultivars there, with different varieties found on different islands. For example, Mājro Atoll is home to a reported 21 different pandanus varieties. According to Taafaki et al. (2006), there are a couple varieties of pandanus that are used in traditional Marshallese medicine. The main trunk of the trees is thorny or bumpy and is surrounded by many prop and aerial roots (Taafaki et al., 2006).

Pandanus trees may produce two harvests per year for more than 20 years, although older trees do not fruit as prolifically. The typical season for pandanus on Namu Atoll is October through December. Pollock counted twenty-four different varieties of pandanus on Namu, all maturing at different times during the season. Some of them produced fruits for fresh eating and others had to be cooked (Pollock, 1992). Pandanus trees are monoecious, meaning they have both male and female flowers on the same tree. The male flowers are creamy white and pleasant-smelling (Taafaki et al., 2006).

The high-carb pandanus fruits contain large amounts of vitamins A and C, and some calcium (Pollock, 1992). In general, the deeper the orange color of the ripe key, the higher the carotenoid content (Englberger et al., 2006). Takeuchi describes the taste as a combination of citrus and guava (Takeuchi and Koning, 2010). Two of the most popular traditional Marshallese dishes made from pandanus are *jāānkun* and *peru*. Rudiak-Gould (2009:86) recounts the making of *jāānkun*, a snack like a homemade Fruit Roll-Up. "The keys were boiled, their meat scraped into a barrel and cooked over a fire, and then the resulting paste was sun-dried in large sheets." *Jāānkun* may be stored for many years (Thomas, 2008). Marshallese people used to pack it for sustenance on long voyages. Peru is a pudding-like concoction made of pandanus juice and starch steamed inside a leaf. Leaf coverings serve to protect food from direct heat and give them a subtle flavor. Several other cultures (West Africans, Mexicans) use leaf coverings in their traditional dishes.

Pandanus leaves are not eaten, but they are non-toxic and therefore useful as plate material. The leaves are valuable as thatch, for weaving mats, and for making handicrafts

(Pollock, 1992). The long leaves (like gigantic blades of grass) are arranged in fat spiral formations. They usually have spiny edges, as well as spines along the ventral (bottom) midrib (Taafaki et al., 2006). The roots of pandanus trees could be eaten as a famine food (Wenkam and Baker, 1971).

<u>Pandanus Cake</u> (yields 24 servings)	
<p>Ingredients:</p> <p>2 cups of pandanus</p> <p>½ cup of honey</p> <p>½ cup of oil canola</p> <p>1 cup of soymilk or coconut milk</p> <p>1 tbsp. of lime or apple cider vinegar</p> <p>1 tsp. vanilla</p> <p>¼ cup of ground flaxseed</p> <p>2 ½ cups of whole wheat brown flour</p> <p>1 ½ tbsp. of baking powder</p> <p>1 tsp. baking soda</p> <p>½ tsp. salt</p> <p>1 tsp. salt</p> <p>1 tsp. cinnamon</p> <p>½ tsp. cloves</p> <p>½ tsp. allspice</p> <p>1 cup of walnuts</p>	<p>Directions:</p> <p>1. Put the oven on 350 degrees F.</p> <p>2. Add pandanus, apple sauce, honey, lime, milk, vanilla, flaxseed in a bowl.</p> <p>3. Add flour, baking powder, baking soda, salt, cinnamon, cloves, and allspice in another bowl. Pour it into the other bowl and mix them together.</p> <p>4. Add walnut.</p> <p>5. Use baking oil on the pan. Bake it in the oven at 350 F for 50 minutes.</p>

Figure 5.3. Recipe for pandanus cake from B. Maddison of Springdale

laraj, giant swamp taro, (*Cyrtosperma chamissonis*)

In the Marshall Islands, giant swamp taro is grown in special pits called *bōl*. Pollock (1992) notes four different plants from the Araceae family which are commonly called "taro" in English (In Latin they are *Colocasia esculenta*, *Alocasia macrorrhiza*, *Cyrtosperma chamissonis*, and *Xanthosoma sagittifolium/atrovirens/violaceum*). Although the most common taro throughout the Pacific is *Colocasia esculenta* (taro, true taro, Polynesian taro, Asia taro, red taro, . . .), the species that grows best in the RMI is *Cyrtosperma chamissonis* (giant/swamp

taro). *Cyrtosperma chamissonis* may also be called *Cyrtosperma edulis* (Pollock, 1992).

Cyrtosperma chamissonis originated in Southeast Asia and likely made its way to the Marshall Islands from Indonesia many years before European contact (Pollock, 1992). Still, it is considered to be an introduced species in the Marshall Islands (Thaman, 2008).

In Marshallese, *Cyrtosperma chamissonis* is called *iaraj* (Abo et al., 1976), so *iaraj* is their general word that means taro, although it refers to *Cyrtosperma chamissonis* and not *Colocasia esculenta*. In the RMI, *Colocasia esculenta*, less commonly grown there, is known as *kōtak* (Abo et al., 1976). *Alocasia macrorrhiza* is called *wot*, and *Xanthosoma sagittifolium* is called *aliklik* (Thaman, 2008). Along with breadfruit and pandanus, taro is important as a staple starch in the Marshall Islands, providing vitamin A and protein. Eating taro has been shown to correlate with good tooth and gum health (Pollock, 1992).

Cyrtosperma chamissonis is the largest species in the Araceae family (Pollock, 1992), growing taller than - and producing tubers weighing almost as much as - an adult human. Clearly, the plant is "giant". Its other moniker, "swamp", comes from its preference for growing in shady spots with a fairly constant and static water supply, such as the pits, or *bōl*, that Marshallese people dig especially for it. *Cyrtosperma chamissonis* pits are usually dug near the center of an islet, where the groundwater is less brackish, although it does tolerate a good amount of salt. Taro pits are dug approximately 20 m x 10 m, and 2-3 meters deep (down to the freshwater lens). Care is taken to furnish the pits with appropriate compost materials. The resulting muck soil, called *bwidej kōn*, is full of organic matter and extremely fertile (Thaman, 2008). The *Cyrtosperma chamissonis* must be propagated vegetatively, as its seeds are seldom viable. The leaf stalks, shoots from old rootstocks, or the top of a harvested corm may be used as planting material (Pollock, 1992). Like a human baby, taro corms need at least nine months to mature (Thaman, 2008).

Pollock (1992) reported that taro was eaten in slices. The starch grains of taro are so small (about one-tenth the size of potato starch grains) that they are very easily digestible. Taro

is a good source of calcium when properly cooked. The tricky thing about taro is that when raw, it is toxic. It's not lethal (although some varieties are more toxic than others). But oxalic acid crystals just beneath the skin of the vegetable will cause an unpleasant, itchy feeling around the mouth unless they are destroyed by cooking. Unfortunately, even when properly cooked, it has been observed that *Cyrtosperma chamissonis* tastes worse than other types of taro (Pollock, 1992).

Unfortunately, taro production in the RMI has fallen out of fashion due to increasing salinity, the popularity of wage labor and imported foods, and other factors. Thaman (2008) notes that many taro pits are now unused. Goodell (2017) however, reports that government sponsored programs in the RMI are experimenting with salt-resistant taro hybrids.

***Kajaba*, cassava (*Manihot esculenta*)**

Cassava, or manioc, is a tropical plant in the Euphorbiaceae family that is not native to the RMI. Although it was brought to the Pacific by Spanish sailors, cassava did not become a popular food crop there until the 1960s. Still, as a starchy root, cassava fits with Marshallese food ideas much better than other introduced species such as cabbages and tomatoes (Pollock, 1992). Thaman (2008) reports that cassava is most commonly found in the RMI in home gardens of Fijian immigrants. Cassava is native to Brazil, making its way to the RMI via Africa, as Europeans there used it to provision their colonies (Pollock, 1992). In the RMI it is called *kajaba*, a cognate not found in the standard dictionary. Some hybrid cassavas are relatively salt-resistant, an important quality for cultivation in the RMI where global changes are causing the coral soil to become more and more salty (Goodell, 2017).

Cassava roots are high in starch and low in vitamins and minerals, although the flour has some calcium and iron. They are toxic until thoroughly processed, containing a lot of hydrocyanic acid. Eating cassava may affect thyroid (Pollock, 1992) and neurological (Le, 2016) function. It can affect the metabolism of several vitamins and minerals, especially

calcium. Le (2016) notes that there are many ways of processing the vegetable to remove the cyanide compounds including chopping or grating it into small bits, then drying, soaking, roasting, boiling (uncovered), steaming, or fermenting it. In Springdale, the owner of the P & N Grocery Store on Thompson is responsible for introducing cassava to migrant Marshallese homemakers and teaching them how to properly cook it. They call her “the cassava lady”. Cassava is popular in Springdale among Latinos as well.

Kanniok kuwat (*canned meats*), *SPAM and Corned Beef*

First brought to the Marshall Islands by American soldiers during WWII, by the early 2000s SPAM “had become as typically Marshallese as preserved breadfruit and fried reef fish (Rudiak-Gould, 2009:85).” Made by the Hormel Foods Corporation, the canned meat that has such a low status in the US is much more popular in the RMI, especially on the Outer Islands. In Mājro, SPAM is available in vending machines.

Keinabbu, *Papaya (Carica papaya)*

Papaya is not native to the Marshall Islands. However, it is often planted in man-made habitats such as gardens and taro pits (Thaman, 2008). Although the plants resemble small trees, they are actually “herbs”. The fruits are sweet and mild, and may contain some vitamin A (McGee, 2004). Papaya is a good source of the phytochemical beta-carotene (Liu, 2012). Papayas grow well in the RMI (Nakano, 1983). They are the fastest traditional plant to produce food after a disastrous typhoon (D’Arcy, 2006). The fruits contain phytates, chemicals they use to store phosphorus. When a person then eats the fruit, the phytates can bind to minerals like calcium, iron, zinc, and magnesium in his body and prevent them from being absorbed. Mineral deficiencies can develop as a consequence (Le, 2016).

Laim, *lime (Citrus aurantifolia)*

Lime trees grow in the Marshall Islands. The fruit juice is squeezed on raw fish and the zest is sometimes grated into *lukor*. However, Thaman (2008) notes that lime trees were more

abundant in the RMI in the past as part of home gardens. Some varieties of limes can be grown indoors in large pots in Springdale.

mā, breadfruit (*Artocarpus altilus*)

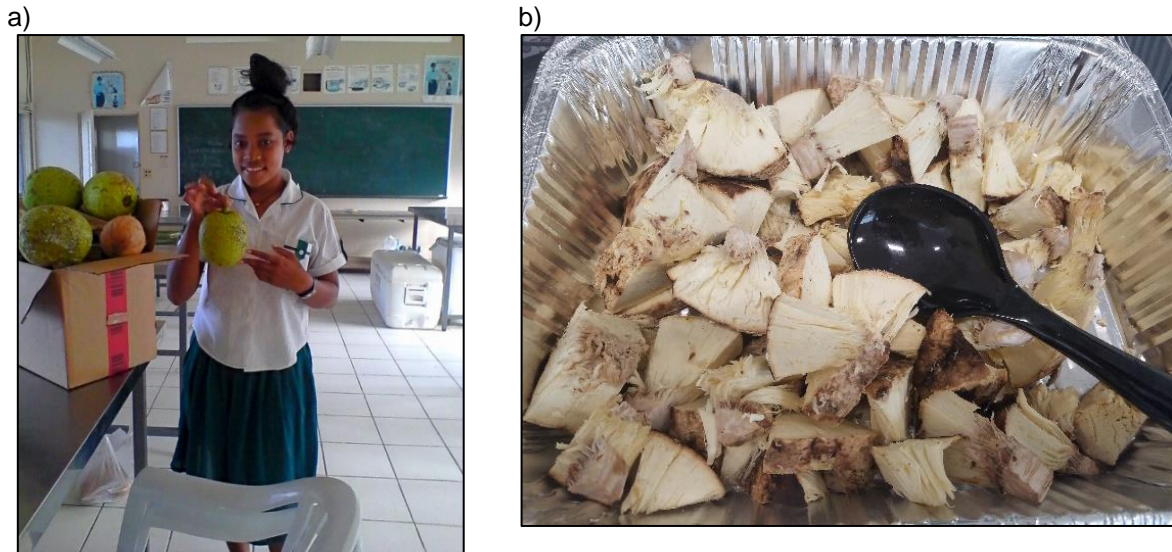


Figure 5.4.a) Student in the RMI holding breadfruit, photo by C. Burrus,
b) Sliced and cooked breadfruit

Breadfruit is an evergreen tree. It is quite tall by Pacific Islands standards, averaging about 14 meters in height (sometimes topping 18 meters, or 59 feet) and providing a shady microclimate for home gardens and agroforestry systems. The size of the leaves and fruits vary by cultivar (Micronesia hosts about 130 different cultivars). However, the leaves have the characteristic lobed shape of the Moraceae and the fruits are generally rounded. Most trees are reproduced from cuttings. Therefore, even though breadfruit was domesticated in the Pacific, there are no natural stands there. The trees are planted on or near homesteads (Lewis, 1988; Pollock, 1992).

When breadfruits are ripe, a process that takes many weeks, their skins begin to yellow and the flesh becomes soft and sweet. Breadfruit trees are relatively easy to care for; their leaves are raked to produce an excellent mulch, and the trees themselves must be pruned on occasion to keep their height manageable. Typically, breadfruit trees are harvested twice a

year, with the secondary harvest being slightly less abundant. However, Ragone (2007) suggests planting different varieties that ripen at different times of year to ensure an almost continuous supply of breadfruit.

The fruits are not usually eaten raw, but rather traditionally roasted, baked, steamed, dried, or fermented. Today they may also be boiled or fried. Breadfruits are calorie-rich, with fruits weighing up to six kg providing almost 3,000 kcals! The fruit is a good source of B vitamins (Lewis, 1988), calcium, magnesium, and potassium (Ragone, 2007). It is high in dietary fiber with a low-moderate Glycemic Index (GI) of 47 when boiled (Ragone, 2007; Bahado-Singh et al. 2006). Roasting breadfruit causes an increase in the GI to about 72 (Bahado-Singh et al., 2006). It has been said that the taste of the fruit resembles a slightly sweet potato. The edible, nutty seeds are high in protein (Lewis, 1988).

Any way you slice it, breadfruit is ranked first in frequency and salience. One of the WorldTeach volunteers I met had a Marshallese student named “Brad”, after the breadfruit tree. While it is so popular in the Caribbean as to have a catchy pop song (“Roast or Fry (Breadfruit)” by Chi Ching Ching), most North Americans probably haven’t eaten breadfruit. However, in reading about food and foodways, breadfruit narratives pop up in history books about Captain Cook and Captain Bligh, biological anthropology books by Wrangham (2009) and Le (2016), as well as magazine articles on subjects such as food security and nutrition. The relevance of breadfruit both in and outside of the RMI seems to be surging. Many folks, including Pierre Omidyar, the founder of eBay, are excited about breadfruit’s potential to a) alleviate malnutrition and food insecurity in tropical countries, and b) enter the superfood market in the First World.

Scientists debate the center of origin of breadfruit. Its domestication occurred a thousand or more years ago and spread throughout the Pacific and Southern Asia. It is considered an introduced species in the Marshall Islands (Thaman, 2008). In the late 1700s it was taken to the Caribbean by aristocratic naturalists who thought it would be a good source of

food for slaves. Today, breadfruit is touted as a superfood, with cultivation programs in places throughout Oceania and the Caribbean, as well as in sub-Saharan Africa.

Although the general term for breadfruit in Marshallese is *mā* (Abo et al., 1976), there are many different named varieties of breadfruit in the RMI. The tree trunks are smooth and gray, perfect for making canoes. Although the shape of the large, leathery leaves varies between varieties, they are characteristically lobed (Pollock, 1992). Breadfruit trees shed their leaves profusely. A common daily chore in the RMI is to sweep the breadfruit leaves from one's yard (M. Waldron, 2015, Personal Communication). The most common species of breadfruit grown in the Marshall Islands is the seedless kind. However, both the seeded and seedless species of breadfruit are propagated vegetatively (from cuttings and sprouts) to save time - it takes five years for a breadfruit tree to start bearing its scaly, green fruit. However, once established, a breadfruit tree may continue to produce two to three harvests of breadfruit each year for up to 50 years (Pollock, 1992). Once a year there is a major harvest, and the following secondary (and perhaps tertiary) harvests are lesser (Pollock, 1992). One breadfruit tree can produce almost 700 fruits per year (Le, 2016)! Different varieties produce harvests at slightly different times of year, so having access to a diverse collection of breadfruit trees can guard against periods of famine. The typical season for fresh breadfruit on *Namu Atoll* is March through July, with the secondary and tertiary harvests occurring in the Fall (Pollock, 1992). The slightly oblong fruits range in weight from two to eight pounds (Le, 2016).

Male and female breadfruit flowers grow on the same tree (it is monoecious). Fifteen hundred to 2,500 teensy male flowers appear on club shaped inflorescences 45 cm long and almost 5 cm in diameter. After the male inflorescences appear, the female ones start to come out. These ladies have 1,500 to 2,000 minute flowers. With or without pollination, the female flowers will fuse to make the edible flesh of the breadfruit (breadfruits are the type of compound/multiple fruits called syncarps) (Breadfruit Institute, National Tropical Botanical Garden, 2017).

Breadfruit trees are sensitive to cold, salt, drought (Pollock, 1992), and wind damage (D'Arcy, 2006). They are typically mulched as part of their care regimen (Thaman, 2008). They prefer regular watering and temperatures between 70 F and 90 F (Le, 2016). Breadfruit trees are owned by the people who plant them and then passed down through the family. Because of family ties, a Marshallese person may have rights to pick breadfruit from several different trees, even if those trees are on land they don't own (Pollock, 1992).

In the 1600s, Europeans dubbed the tree *Artocarpus altilis* "breadfruit" because they thought the taste and texture of its fruits resembled their bread (Pollock, 1992). The fruits have a similar CHO profile to cereal grains such as wheat (Le, 2016). Breadfruits are picked using a special tool that resembles a long pole with a fork at the top. The fruits become sweeter as they ripen, so the time of harvesting is a matter of taste (Pollock, 1992). However, once picked, breadfruit does not store well unless it is treated - usually by fermenting it into *bwiro*. It is also important to pick the fruits before they fall from the tall trees and suffer damage that way (Le, 2016).

Not all Micronesian cultures fermented breadfruit, as Lewis (1988) reported from Marakei Atoll in Kiribati. However, fermented breadfruit, called *bwiro* in the Marshalls, was an important staple for many Micronesians in the season opposite breadfruit fruition. Fresh breadfruits do not keep well in the tropical climate of Micronesia, but *bwiro* may be stored for decades (Pollock, 1992). The complex process of *bwiro* making was described to me by several Marshallese people now living in Arkansas, indicating that it is ingrained in their collective imagination-even though Rudiak-Gould (2009) wrote that back in the Islands, *bwiro* has lost much of its popularity to rice and other imports.

Women are generally the ones who cook breadfruit (Barker, 2013). On *Namu* Atoll in the late 1960s, Pollock (1992:55) ate slices of breadfruits that had been baked whole in the coals of a coconut husk fire, a common method of preparation. She says that after baking, the breadfruit was "harder and drier". Evans describes the taste of baked breadfruit as a

combination of baked potato and nutmeg (Evans, 1992). Le (2016:24) also approved of its “nutty” flavor. However, the baked potato comparison failed to entice Rudiak-Gould, who implies he might have preferred his portion of breadfruit buttered (Rudiak-Gould, 2009). Obviously lacking butter in the RMI, slices of cooked breadfruit could be seasoned by dipping in seawater or grated coconut. Taro was prepared in a similar way (Pollock, 1992).

One of the most popular ways to prepare breadfruit, according to Pollock (1992), is *pōljej*. A core is made in the whole breadfruit and it is stuffed with coconut cream and then baked. During the brief time of year when *pōljej* could be prepared, people were more satisfied with the Sunday meal. Rudiak-Gould favorably compared the addition of the coconut cream on the baked breadfruit to spreading butter on dry toast (Rudiak-Gould, 2009). Other popular Marshallese breadfruit dishes include *jokkwōp*, a soupy dish made with coconut milk, *mokwan*, dried breadfruit paste, and *bilitudek*, breadfruit baked with coconut oil. Breadfruit provides a small amount of calcium, iron, riboflavin, niacin, and vitamin C (Pollock, 1992).

In addition to being the primary source of food, breadfruits are also used in certain ceremonies (Pollock, 1992). Furthermore, the trees have myriad other uses. They are the main material resource for building and caulking canoes (from the trunk and sap, respectively). As luck would have it, “breadfruit wood is easy to work, and swells in water, so that joins become more watertight. It is also not susceptible to the wood-boring teredo “sea-worm” (D’Arcy, 2006:90)”. However, the historian continues, “The use of breadfruit as timber was restrained by its prolific fruit-bearing capacity.” The connection between breadfruit trees and canoes is an important one because Micronesians were skilled sailors, fishermen, and navigators. In the RMI canoes are still made from breadfruit wood using both traditional and novel techniques. Other non-food uses of breadfruit trees include carving bowls and masks from the wood and using the sap as glue. The bark of certain species can be made into cloth for clothes and bedding. The leaves are useful in wrapping food, covering the *uhm*, and lining *bwiro* pits (Pollock, 1992), and as food plates (Le, 2016). Old brown breadfruit leaves may be

used as makeshift fans to protect against the tropical heat (Rudiak-Gould, 2009). Breadfruit trees also provide shade. Breadfruit sap and bark also feature prominently in traditional Marshallese medicines. Male breadfruit flowers (which are actually edible) contain a compound more effective at repelling mosquitoes than DEET. The long flowers were commonly burned to ward off pests.

Bwiro

The most important way of preparing breadfruit in the RMI is fermenting it into *bwiro*. Like cheese, *bwiro* can have a powerful odor which may not appeal to everyone. Therefore, the recent hype surrounding the potential of breadfruit as a superfood does not extend to *bwiro*. The strong odor and the flavor of *bwiro* may be attenuated by kneading the slime out of it and or adding coconut cream or sugar. These steps also cut down the acidity of the *bwiro*, which some people like more than others. Indeed, Pollock (1992) argues that the fermentation of the breadfruit developed not only for the sake of preservation, but also for adding the sour taste to Marshallese cuisine.

Since breadfruit fermentation is more common in the Eastern Pacific, some scholars hypothesize that it originated there. It's possible that this method of food preservation and flavor production was brought to the Pacific from Southeast Asia, where soy and fish fermentation is an ancient artform (Pollock, 1992).

The "leisurely summer activity" of people getting together to prepare *bwiro* is called *kabwiro* (Rudiak-Gould, 2009:230). To make *bwiro*, the ripe breadfruit is gathered up. The stems are removed and the fruit is peeled and sliced (Pollock, 1992). The peel is traditionally scraped off with a seashell (Rudiak-Gould, 2009). The cut up breadfruit is marinated in the ocean for 12-24 hours. Meanwhile, the pits are dug and lined with the leaves of *ti*, banana, or heliconia. After the fruit is removed from the water, it is smashed to a paste, placed inside the pits, and carefully covered with more leaves and then rocks. In some places, smashing the

breadfruit into paste is done by foot, drawing comparisons to wine-making (Pollock, 1992). Rudiak-Gould (2009) notes that it took about half an hour of treading to get the breadfruit to the right consistency. *Bwiro* may be ready in as few as five days. Its acidity increases for about ten days after it is tucked into the pit, and then starts to decline. Thus as *bwiro* ferments in the pit, its taste changes. Some flavors can be controlled by changing out the leaves that line the pit (Pollock, 1992).

The taste of *bwiro*, which is usually baked before being eaten, has been described as less potato-like (and more bread-like or fruit-like) than non-fermented cooked breadfruit. One type of *bwiro* is sweet and moist like American fruitcake. That must be the kind I sampled because I thought that aside from the dingy mauve color, it was an appealing food. There is also a drier, sour version of *bwiro* that few non-Marshallese people are said to enjoy (Rudiak-Gould, 2009).

Fermented foods tend to have a strong umami taste, universally described as “cheesy”. The prevailing hypothesis about the purpose of this taste is that it evolved to attract humans to foods containing purine (an amino acid) which increases our production of the antioxidant uric acid (Le, 2016). We need lots of antioxidants because we also need oxygen. However, oxygen can damage our cells. Antioxidants help protect our cells from oxidative damage. Unfortunately, these days people might eat too much umami-tasting food (e.g. lobster, steak, beer) and end up with too much uric acid, which causes gout.

Despite their many amazing qualities, breadfruit trees have not yet figured into the global mass market in the manner of the ubiquitous banana, or even in the manner of the mildly exotic mango. It seems that the marketing and cooking techniques are ready for that next push. However, the technology required to mass produce, store, and transport breadfruits just isn't there yet (Le, 2016). Outside of certain places like the RMI, Hawaii, and the Caribbean, breadfruits are mysterious scaly orbs.

<u>Breadfruit Stew</u>	
<p>Ingredients:</p> <p>5 cups of water</p> <p>3 cups of breadfruit, cut into small pieces</p> <p>1 small onion, cut into small pieces</p> <p>2 cloves garlic, cut into small pieces</p> <p>2 tbsp. ginger, scrape</p> <p>1 tsp. curry powder</p> <p>2 bay leaves</p> <p>1 tbsp. chicken-style seasoning</p> <p>2 cups of peas, corn or mix vegetables (frozen)</p> <p>2 cups of cabbage or other vegetables, cut into small pieces</p> <p>1 can of red kidney beans</p> <p>1 can of white kidney beans</p> <p>1 cup of coconut milk</p>	<p>Directions:</p> <p>Cook the breadfruits in boiling water with bay leaves for 20 minutes. Add onion, garlic, ginger, curry powder, salt and bean. Cook for another 10-15 minutes. Add cabbage and peas. Cook for 5 minutes.</p>

Figure 5.5. Recipe for breadfruit stew from B. Maddison of Springdale

***Mañko*, mango (*Mangifera indica*)**

Mangos are another good source of beta-carotene (Liu, 2012). They do contain free fructose, which ferments rapidly in our bodies. The gases produced from the fermentation happening in our guts can cause intestinal woes including bloating and diarrhea. Fortunately, the discomfort may be avoided by moderate intake of these sugary fruits and perhaps a little bit of exercise (Le, 2016).

***Makmōk*, arrowroot (*Tacca leontopetaloides*/*Tacca pinnatifida*)**

The arrowroot of the Pacific is not the "true" arrowroot, *Maranta arundinacea*, native to South America. Rather, the "Polynesian" arrowroot traditionally grown in the Marshall Islands is either *Tacca leontopetaloides* or *Tacca pinnatifida*, from Southeast Asia. Some researchers have suggested that this arrowroot, as floating seeds, arrived in the Marshall Islands before humans (Pollock, 1992).

The Marshallese name for arrowroot is *makmōk*. In English, Marshallese people refer to arrowroot simply as "starch". Like the starches made from corn or potato that are available for purchase in the US, arrowroot was dried and ground for use as a powder. Until recent decades, it was an important "fall-back" food source in the Marshall Islands (Pollock, 1992).

Smith-Norris (2016) notes that Rongelapese people who ate contaminated arrowroot seven years after the "Bravo Shot" suffered from mouth sores and diarrhea. However, I believe that she may have some of the traditional Marshallese plants confused, because in a previous section it seems she mistakes *makmōk* for "tapioca" in a quote from a Rongelap citizen, Lijon Eknilang: "Some of our food crops, such as arrowroot, had completely disappeared. *Makmok*, or tapioca plants, stopped bearing fruit. What we ate gave us blisters on our lips and in our mouths and we suffered terrible stomach problems and nausea. Some of the fish we caught caused the same problems. These were things that had not happened before 1954. Our staple foods had never made us ill (p.86)." So, I'm not entirely sure Smith-Norris means to say that arrowroot made people sick. It is possible that she means it was taro that made people sick, because I can see how the two staple root crops could be confused and also because the symptoms sound similar to the consequences of eating unprocessed taro. To be clear, *makmōk* is arrowroot (*Tacca leontopetaloides*), *iaraj* is the most common type of taro (*Cyrtosperma chaminossis*) in the RMI, and tapioca, or cassava, *Manihot esculenta*, is not a traditional Marshallese food (although it is gaining in popularity these days, especially in Springdale).

Residual radiation from atomic testing in the Marshall Islands has negatively affected the growth and survival of arrowroot plants throughout the country (Smith-Norris, 2016). Activists visiting the Outer Islands were shown arrowroot plants that still grew, but the bulbs were peanut sized instead of the dimension of a large potato as in the past before nuclear testing (Johnson, 2013). Because of this problem, arrowroot starch has been largely replaced by imported cornstarch in the RMI today. However, in the past it was a significant crop, harvested during

one month each year and processed into a type of flour. The flour could then be stored for many years (Thomas, 2008). Each year's crop was simply left to reseed or vegetatively reproduce itself for the next year. In that sense, it was only semi-cultivated. "Wild" patches of arrowroot were found partially shaded (perhaps by a coconut tree), in loose, sandy soil above the high tide limit. In order for the flour to be edible, arrowroots had to be grated, leached, then rinsed repeatedly in fresh water. The toxic compounds in arrowroot are hydrocyanogens. Prussic acid, aka hydrogen cyanide, is extremely toxic. Fortunately, it is also very water-soluble, as well as sensitive to temperatures above 150 °C (Pollock, 1992).

The nutritional value of arrowroot, aside from its starch content, is relatively low. It has some calcium and iron but no vitamins. Arrowroot flour was usually mixed with other starches. Besides its use as a food, arrowroot starch was used by early missionaries in the Pacific as laundry starch. And by the mid-1800s, even Europeans back on the continent knew about its stomach-healing properties (Pollock, 1992).

Markinenjojo, beach cowpea (*Vigna marina* L.)

Nobody I encountered in Springdale mentioned this leafy green vegetable. However, it has been recommended as an ecologically convenient source of nutrients for the Marshallese diet.

Nin, beach mulberry/Indian mulberry (*Morinda citrifolia*)

While researching Marshallese foodways and culture in Springdale, I read and heard much about the plant called *nin*. Living persons use this plant more as a medicine than a food source. However, D'Arcy (2006:121) writes that Marshallese souls bound for the "afterlife islands" stop at *Narikerik* Island near *Mille Atoll* to pick *nin* (which he describes as "a slimy creeper growing on the beach"). Presumably, *nin* provides the souls with nourishment for their journey.

Pinana, banana (Musa spp)

Bananas and plantains are the world's number one fruit crop, with an annual consumption rate of 14 kg (30 lbs) per human being. Technically, bananas and plantains are both considered highly nutritious berries containing protein, vitamin A, and some vitamin C. Their starch is easily digestible. The distinction between bananas and plantains can be subjective. In general, bananas are sweet varieties and plantains are starchy varieties of the same plant species. Bananas can be some of the sweetest fruits in the world (after dates). The plants are highly productive (McGee, 2004) and bear fruit just a year or two after planting (Pollock, 1992; Le, 2016). Both the sweet (yellow) and starchy (green) kinds of *Musas* are found in the Pacific. In the RMI, bananas only grow on the southern atolls, where the temperatures are warmer and there is more moisture. They are typically considered a fall-back food source. However, the atoll of Namdik is especially famous for its bananas and banana dishes (A. Lator, 2014, Personal Communication). Bananas originated in Southeast Asia (Pollock, 1992). They are considered introduced species in the Marshall Islands (Thaman, 2008). The variety of banana that has taken over American supermarkets is the Cavendish. However in Springdale I was able to purchase several different varieties of bananas from a couple of Asian grocery stores. Different types of bananas have different nutritional value. Rudiak-Gould describes boiled green bananas as "mealy and insipid (Rudiak-Gould, 2009:26)."

Banana plants are not technically trees. Rather they are some of the tallest "herbs" in the world. The plants are quite sensitive to wind and they like their soil very wet. Although some of the fruits have seeds, banana plants are propagated vegetatively from shoots taken from the base of the parent plant (Pollock, 1992).

Raij, rice (*Oryza sativa*)



Figure 5.6. a) Large amount of rice being prepped for a party in Springdale, b) Baañke raij (pumpkin rice), a popular Marshallese dish

In the late 1960s when Pollock lived on *Namu*, she claimed that rice and wheat flour were merely welcome alternatives for traditional starches such as breadfruit. She did not seem to think that they could replace breadfruit in Marshallese cuisine (Pollock, 1992). Perhaps rice does not have the symbolic power of breadfruit, but in frequency of consumption it is right on par with the traditional staple starch. Rice does not grow well in the RMI (Nakano, 1983) and must therefore be imported. Marshallese people for the most part consume white rice, from which the outer bran and germ layers of the grain have been removed. White rice has a Glycemic Index (GI) of about 64, which is considered high (Sun et al., 2010).

Seafood

“Ethnologists regard a society to be fisher-folk if marine species make up ten percent of the diet (D’Arcy, 2006:35).” The Marshallese people definitely qualify. A variety of fresh seafood has always been available in the Islands - fish, clams, crabs, lobsters, snails, octopus, sharks, sea turtles, and more. Thomas (2008) reports that Marshallese marine habitats have played host to more than 1,000 different species of shellfish and almost as many species of fish. However, this aquatic pantry was subject to variability depending on location and time. In some

cases it was even further limited by climate conditions (D'Arcy, 2006) and/or cultural sanctions, or *m̧* (Thomas, 2008). *M̧* regulations are commonly explained as a way for *iroij* to protect natural resources. Other cultures have similar reserves, such as the sacred forests of sub-Saharan Africa. In the Marshall Islands, the punishment for fishing in an area declared to be could have been as serious as death (Thomas, 2008).

shellfish

The shellfish grouping includes marine organisms that lack a backbone (invertebrates) such as mollusks (e.g. Clams, snails, octopi) and crustaceans (e.g. Lobsters, crabs, shrimp). McGee (2004:223) describes mollusks as “the strangest creatures we eat.” Archeological collections of seashells show that humans have been eating mollusks for a very long time. It has been suggested that snails were the first animals actively farmed by humans. There are around 100,000 species of mollusks, far more than there are fish with backbones. Most mollusks contain flavorful amino acids to balance their saltwater intake, so the saltier their environment, the more delicious they may be. However, mollusks tend to go bad very rapidly (McGee, 2004).

When there is a combination of both a full moon and a low tide, it's sea snail gathering time in the Marshall Islands. There are several different kinds of snail-like creatures in the RMI. The biggest kind have pointed conical shells and the smallest kind have a dark, round shell the size of a walnut. Snail gathering is a family event. Everyone goes out holding a flashlight in their mouth and a bucket in one hand, the other hand free for scooping up snails. The harvested snails are left for about a day in fresh water to clean them off and then boiled or preserved in brine like a kind of snail-jerky.

Crustaceans have legs, claws, and a tough outer coat. They are one of the oldest groups of animals on Earth, and also one of the most successful as there are many different species. However, they are challenging to farm because they are aggressive. In addition, their

flavor and texture depend on where they are in their lifecycle, so wild crustaceans must be collected seasonally (with the season dependent on species and location) (McGee, 2004). Coconut crabs, *barulep*, are frightening-looking wild crustaceans traditionally hunted and eaten by Marshallese people. Crabs, like fatty fish, contain high levels of healthy omega-3 fats (McEvoy et al., 2012). Rudiak-Gould (2009:86) describes a type of relish made from boiled crab guts as "delectable". Unfortunately though, because coconut crabs eat their own shells after molting (shedding the old shell and growing a new one), they can accumulate particularly high amounts of radioactivity from contaminated environments (Smith-Norris, 2016).

Marshallese lobsters are not quite as scary in appearance as coconut crabs because they have no claws. They are like Caribbean lobsters with big tails. The full moon is lobster-fishing time in the Marshall Islands. Night fishing is also good for catching various types of fin fish (Nakano, 1983).

Ek, fish



Figure 5.7. One of the infamous coolers of fish brought from the RMI to Springdale

Unlike shellfish, fish are vertebrates, meaning they have backbones (among other characteristics). They are a highly diverse group of organisms, about 29,000 species strong (McGee, 2004). The lagoons of the Marshallese atolls are feeding grounds for various reef fish (Smith-Norris, 2016). People usually fish in the lagoon as opposed to the open ocean because

the ocean has bigger waves and bigger sharks. Marshallese people in Springdale have contrasted the “clean”, salty flavor of saltwater fish such as blue runner (not a traditional Marshallese species, but a type of saltwater fish available in Springdale) to the “muddy” flavor of freshwater fish such as catfish (P. Boaz, Personal Communication, 2018). Fishing, for leisure or profit, is traditionally the domain of Marshallese men. Today it remains less common, but is not entirely shocking, for Marshallese women to go out fishing. “Fishing is hard.” An informant admitted to Nakano (1989:131). Trolling is a technologically advanced form of fishing popular in the RMI. It can result in impressive catches. However, fishing equipment and boat fuel are not cheap. Some of the more common species brought in are yellowfin tuna, bonito, and skipjack. The big fish come to the Marshalls around September (Nakano, 1983).

Seafood and fish are the main traditional sources of protein for the Marshallese people (Pollock, 1992; Thomas, 2008). In addition to protein, fish and shellfish contain large amounts of B vitamins, vitamin D, iodine, and calcium. The lipids found in ocean fish, unlike those of land animals, contain mostly unsaturated fatty acids and therefore tend to be liquid at room temperature. Because of the fluidity of these lipids, fish can maintain their bodies at various depths and temperatures (Le, 2016). Although fish generally don't contain high levels of fats and oils, the omega-3 fatty acids found in ocean fish are extremely beneficial to humans (McGee, 2004). The two most powerful molecules in fish fat are called eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (McEvoy et al., 2012). These long molecules, which humans themselves cannot create as easily as fish, work to improve the brain and retina, and are especially important during human developmental stages. When fish are eaten by a mother during her third trimester of pregnancy, they may help boost the baby's IQ (McEvoy et al., 2012). In general, omega-3 fatty acids decrease inflammation in humans, including pain and swelling (Le, 2016). In addition, the human body may convert omega-3s to molecules called eicosanoids, which lower the risks of cancer, heart disease, and stroke. Omega-3s are found primarily in wild-caught ocean fish (McGee, 2004), especially in fatty fish like mackerel,

sardines, and salmon (McEvoy et al., 2012). Industrialized diets usually contain more omega-6 fatty acids and less omega-3 fatty acids because of processed cooking oils such as canola oil. The ratio of omega-3 to omega-6 fatty acids should be more like 1:1 but for Americans it's about 1:10. Farmed fish don't have the right diet to produce as much omega-3s as wild caught fish. All edible fish however, generally make healthy meals compared to the meat of land animals (McGee, 2004). Some of the benefits of fish-eating are decreased risk of obesity (Whittle et al., 2012), and decreased risk of heart attack, cancer, arthritis, and dementia (McEvoy et al., 2012).

Among Marshallese people, when fish is shared among family members and guests there are pieces that are more and less desirable. One of the best parts of the fish is the head. Pollock reports that this was usually given to the eldest sister (Pollock, 1992). Evans too writes of this as "the customary delicacy: the fish heads, sweet meat dug from the shoulders of full-grown bass (Evans, 1992:268)." In the RMI, fish is eaten raw when it is extremely fresh. Ocean fish is the best kind of meat to enjoy raw because it has the most well-rounded flavor profile. Marshallese people do not heavily season their fresh raw fish. The molecules (especially the amino acids glycine, which is sweet, and glutamate, which is umami) that ocean fish use to regulate their internal salt balance turn out to be quite appetizing to humans. *Jaajmi* is a Marshallese cognate of the Japanese word, sashimi, a dish of raw, lightly seasoned fish. Fresh tuna, a fish about one to one and half feet long, is cut up and mixed with mayonnaise, lime juice, and tiny red chili peppers. The lime juice lends the dish a bit of tang. In Japan, *jaajmi* was originally prepared by fermenting the fish with rice, but by the 1800s, well before Japanese influence in the Marshall Islands, the fermentation process was replaced by the addition of vinegar (Kim, 2013). The sour, acidic lime juice subsequently replaces the vinegar in the Marshallese recipe. Eating fish raw saves fuel, an important concern in the atoll environment. Some fish also contain other salt-regulating molecules such as urea and trimethylamine oxide (TMAO) that are responsible for the powerfully repellent odors produced after they sit for a

while. Indeed, fish and seafood turn bad faster than the meat of land animals, even when stored in ice. Fish also cook faster than other types of meat (McGee, 2004).

Large fish traps, or *me*, were traditionally constructed out of coral rocks. They were shaped like the outline of a giant lightbulb. Tobin (2002) noted that a special rock, the “Rock of Entering”, was placed at the base of the trap, and fish bait such as crab and coconut meat was tied to the rock. This practice encouraged fish to enter the trap.

Fish and fishing figure prominently in Marshallese myths and folktales, *bwebwenatos*. *Iroij Rilik* is the ancient Marshallese god of fish (Barker, 2013). He was an ancient pillar of the world who formed the western sky (Tobin, 2002). A god named *Ṭōmtal*, who created the sea, also created the fish. All of the fish are tattooed with different colors of paint and given names by two other male gods, *Ṭewōj* and *Ṭaneej* (Tobin, 2002).

There is a long list of dangers associated with eating seafood, especially shellfish. Potential hazards include environmental contaminants that make their way inside the food, such as bioaccumulated pollutants, disease causing microbes, and parasites (McGee, 2004). Mercury and polychlorinated bisphenyls (PCBs) have been found in the flesh of large fish from the ocean (Le, 2016).

Ciguatera is a natural type of fish toxicity that occurs from time to time in reef ecosystems when small fish eat dinoflagellates (microscopic algae of the species *Gambierdiscus toxicus*) off the ocean floor. Bigger fish eat the small fish, and so on and so forth, accumulating toxins from the algae, which can poison the humans at the end of the food chain. While ciguatera only occasionally results in coma or death, it can really mess with human digestive and nervous systems (D’Arcy, 2006). Symptoms of ciguatera poisoning which may persist for years include nausea, vomiting, diarrhea, and paralysis (Le, 2016). However, despite toxicity concerns, it seems that the benefits of fish-eating outweigh the potential ill effects. D’Arcy (2006:35) writes that “Ciguatera is so common on some atolls that it is considered an occupational hazard.” Annually, there are tens of thousands of cases of

ciguatera poisoning around the world (Le, 2016). Nakano (1983:134) spoke to a hospital representative on *Mājro* who dismissed the occasional case of ciguatera diarrhea as nothing more than the consequence of “living in an island environment.”

After the radioactive contamination of *Rongelap* Atoll, one type of fish that people used to like, *ellōk*, or rabbitfish (*Siganus rostratus* or *S. puellus*), was found to contain a mysterious new, “black substance” in its stomach (Smith-Norris, 2016:90). Nakano (1983:131) asked several men on *Mājro* whether they were concerned about the safety of Marshallese fish. She was told that, “They [skipjack and other sport fish] follow the sardines from Australia or North America and do not pass through the polluted part of the Marshalls.”

There is also the choking hazard of the numerous fine bones in fish. “Ingestion of fish bones carries the risk of piercing the esophagus or intestines, and triangular fish bones, such as those located around fish heads, can be tricky to extract from the esophagus (Le, 2016:65).” An imbalance of too much protein in the diet can also be unhealthy (Le, 2016), if a person consumes an excessive amount of fish. Excessive consumption of omega-3 fatty acids can also lead to health issues such as prostate cancer and bleeding problems. Likewise, eating too much vitamin D can also be detrimental, especially to children. Symptoms of vitamin D poisoning include constipation, headaches, nausea, vomiting, and kidney stones (Le, 2016). Fish protein is also subject to the production of dangerous molecules during the cooking (grilling, broiling, frying, and smoking) process. High, dry heat promotes the formation of heterocyclic amines, HCAs, and polycyclic aromatic hydrocarbons, PAHs, in fish and other meats. Both molecules have been found to cause cancer in lab animals. However, McGee (2004) offers some solutions such as marinating fish to keep them moist and acidic, and avoiding cooking them on open flames. Steaming, poaching, and braising are also safer methods for preparing fish.

Many fishing grounds surrounding *Kuwajleen* Atoll are off limits today due to missile testing (Johnson, 2013). However, even in accessible lagoons and ocean areas, over-fishing is

a problem these days. There are not as many large fish in the sea as there used to be. People are going to have to get used to eating smaller fish or decreasing their dependence on fish – Le (2016) suggests substituting insects as a protein source. Fortunately, humans can get enough vitamin D by spending time outside in the sun. Humans can also fix their omega by decreasing the amount of cooking oils and processed food consumed (Le, 2016).

Despite all of the issues surrounding seafood consumption, in the US and the UK all people, and especially pregnant women, are being encouraged to eat more fish. In these countries, fish oil pills are popular dietary supplements. However, although the pills may contain healthy EPA and DHA (omega-3s), they generally lack all the other good things found in fish such as vitamin D, selenium, antioxidants, and lean protein. Therefore, it is recommended that people eat actual fish at least twice per week, with at least one of those meals being fatty fish (McEvoy et al., 2012). Women who consume some oily fish during pregnancy, even in the last month, were found to have children who were less prone to asthma and eczema (Le, 2016).

Ocean fish and shellfish taste best at a certain point in their lifecycles, when they are growing and storing their energy. However, these lifecycles are dependent on species type and location (McGee, 2004). No doubt in the long ago past, Marshallese people had intimate knowledge of the lifecycles of the various fish living in the waters around their home atolls. Unfortunately, it is unclear how much of this TEK remains today.

Piik, pork

Crosby (2004:173) refers to pigs as “possibly the ‘weediest’ of all the large domesticated animals” because when they are introduced to an amenable climate, they reproduce rapidly. The tropics are not exactly that amenable for pigs because of the high heat and intense sunlight. However, when provided with water and shade, the animals can adapt to the tropical environment very well, as they have done in the Marshall Islands. Like humans, pigs are omnivorous, and they prefer a similar diet (high in carbohydrates and protein), so they may

compete with humans for resources. Yet when the time comes for the pigs themselves to become the resource, they provide an excellent energy yield, especially when compared to that of other farm animals. "Pigs convert one-fifth of what they eat into food for human consumption, as compared with one twentieth or less for beef steers. (These statistics pertain to twentieth-century livestock, which are larger than in past centuries, but we can assume that as a matter of proportion, the difference in the food-producing efficiencies of pigs and steers was in the colonial period approximately what it is today.) (Crosby, 2004:173)."

In the RMI, there are few farmers and only a handful of those farmers raise pigs. The Taiwanese-led agricultural initiative on *Mājro* has a pig farm. The animals there are served processed copra (much of which is imported from Taiwan) (Nakano, 1983). Butchering a pig for a Marshallese feast is considered men's work. And it takes several men working together to get it done.

Piteto, potatoes (*Solanum tuberosum*)

When introducing a new crop, it helps if the planting and growing habits are similar to familiar crops, so potatoes could be a healthy swap for some more traditional Marshallese starches such as taro if they are of nutritious varieties and eaten in moderation.

Wheat (*Triticum aestivum*)

In the RMI, imported white flour is used to make pancakes, donuts, *jāibo* (dumplings), and bread. Marshallese donuts (*tonaa*) are smaller, denser, and far less sweet than Dunkin Donuts. Rudiak-Gould (2009:26) called them "uninspired". Bread can be baked in gasoline or underground ovens. To make bread in the RMI, women sometimes use the yeast from fermented coconut sap.

Wōn, sea turtle

Sea turtles and their eggs were consumed as part of the traditional Marshallese diet (Pollock, 1992) and they may still be eaten in the RMI today on special occasions. However,

the animals are currently considered endangered. Rudiak-Gould (2009) did not care for the flavor or texture of sea turtle, but other Americans liked it more. I have heard it tastes especially good when it is grilled.

Beverages (alphabetical)

Alcohol

Alcohol was probably first discovered by the Chinese thousands of years ago (Le, 2016) but it was only legalized in Micronesia during the 1960s and 1970s. Even in 2004, the Outer Islands were officially "dry" (Rudiak-Gould, 2009). In Micronesia, alcohol allows people to act out their feelings in a socially acceptable way - by blaming an angry outburst on being drunk (Hezel, 2013). Alcohol also offers a lot of calories, 7 per gram (almost twice as much as carbohydrates and proteins). However, alcohol is not considered a nutrient (McGuire and Beerman, 2007). Because it contains calories but has no nutritional value, drinking a lot of alcohol will make a person feel full enough that his or her appetite will decrease. In some cases, drinking alcohol instead of eating actual food results in malnutrition, especially deficiencies of the B vitamins folate and thiamin (Temple, 2012).

Scientific and anecdotal observations show that moderate alcohol consumption in people over forty years old (Le, 2016) can lower the risk of heart disease (Davis and Milner, 2012). Moderate drinking is considered two drinks per day for men and one for women, where one drink is equal to 12 oz (356 g) of beer, 4-5 oz (118-148 g) of wine, or 1.5 oz (42 g) of spirits. Enjoying small amounts of alcohol is also good for one's blood pressure, preventing gallstones, hearing loss, dementia, diabetes, and lung disease, and for maintaining bone density (Temple, 2012). On the other hand, the International Agency for Cancer Research (IARC) has declared alcohol (meaning the ethanol found in adult beverages) a human carcinogen (something that causes cancer) (Davis and Milner, 2012). Drinking more than the recommended amounts of

alcohol, or binge drinking, is also correlated with increased risk of accidents, violence, suicide, and birth defects (Temple, 2012). “Overall,” concludes Temple (2012:329). “Alcohol certainly causes more deaths than it prevents.” Alcohol is especially dangerous for young people and pregnant women (Temple, 2012). In the RMI, alcohol abuse is on the rise, especially among young men in the Urban Centers.

Kool-Aid

Kool-Aid and its imitators are popular drinks in the RMI and Springdale. Fruit juice is a healthy beverage choice (Wilson, 2012), however, Kool-Aid does not contain enough real fruit juice to count as healthy. What Kool-Aid does contain (in abundance) is sugar. Marshallese people typically prefer sweet drinks.

Kope, coffee

The Marshallese word *kope* refers to the stimulating beverage and also to the act of sitting around drinking coffee and talking (*bwebwenato*). Thus *kope* is both noun and verb. Rudiak-Gould (2009) noted that on Wūjae Atoll, people generally prefer instant coffee (especially Kopiko brand) made with boiling water and lots of sweetener (sugar or coconut sap). Most of my Marshallese friends in Springdale prefer the sweet Frappuccino drinks from the relatively new Springdale Starbucks, or similarly sweet drinks from the local Onyx coffee shop, to drip coffee.

Although coffee contains caffeine, Wilson (2012) maintains that drinking 2-3 cups per day will not adversely affect one’s health. In fact, Le (2016) refers to a study that concluded that American men who drink six or more cups of coffee per day may decrease their risk of death by ten percent (fifteen percent for women). The health benefits of coffee consumption (decreased incidence of cardiovascular disease, diabetes, and infections) are most likely due to the phytochemicals it contains.

ni, coconut (*Cocos nucifera*)

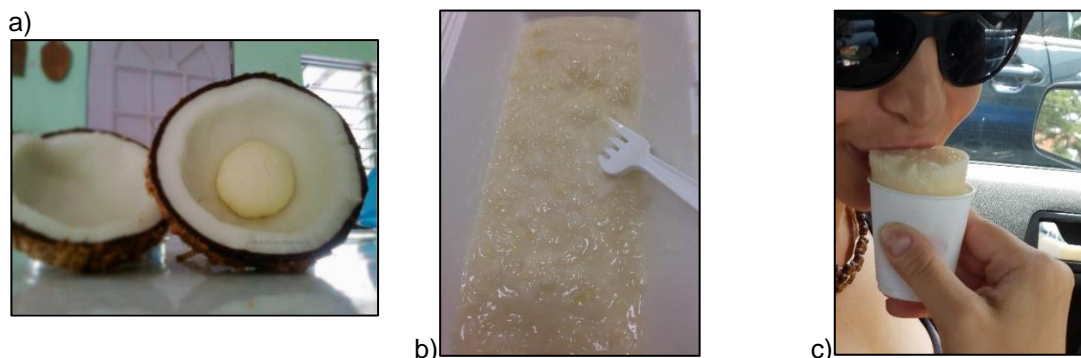


Figure 5.8. a) *Iu*, sprouted coconut, b) *Aikiu*, coconut soup, c) *Iced lukor*, pounded *Iu* with lime zest

The coconut figures prominently in the creation story of the ancient Marshallese (Fowler and Taafaki, 2006). All of the Marshallese plants (except for coconut) came from the wind (Tobin, 2002). In the Marshallese story of creation, the first food is a coconut, birthed by a human woman (Tobin, 2002). Thaman (2008:28) calls coconut (*Cocos nucifera*), “one of the two ‘trees of life’[along with pandanus] in the Marshall Islands, with hundreds of uses.” Coconut is also “the most valuable plant in Marshallese medicine (Taafaki, 2008:129).” Taafaki (2008) recorded 68 different remedies that used various parts of the plant, including both the ripe and the unripe fruits. In the mid-20th century, the Atomic Energy Commission (AEC) estimated that Marshallese people on Āne-wātak Atoll consumed a minimum of 100 grams of coconut each day (Smith-Norris, 2016).

Coconut palms, like other costal plants, are relatively tolerant to salinity and drought (Terry and Thaman, 2008). They are indigenous to the Marshall Islands (Thaman, 2008), where they serve as snack, drink, and *jālele*, shredded coconut meat served along with the staple starch to form a proper meal, in addition to their numerous non-food uses.

Coconuts add lipids to the Marshallese diet (Pollock, 1992). The myriad miracle properties of coconut oil has become a popular health fad extending beyond the borders of Micronesia (Lockyer and Stanner, 2016). Coconut oil is very high in saturated fatty acids

(SFAs), especially lauric acid (Assuncao et al, 2009), and relatively low in mono- and poly-unsaturated fatty acids (MUFAs and PUFAs). Fans of the “Mediterranean Diet” think that MUFAs and PUFAs, like those found in olive oil, are healthier than SFAs like those in coconut oil. However, their evidence (based on a study of only seven countries) is weak. SFA supporters note that consuming lauric acid increases one’s supply of high-density lipoproteins, also known as HDL or “good cholesterol” (Le, 2016). Because SFAs don’t contain any double bonds in their carbon-hydrogen chains, they can stretch out in relatively straight lines, and stack together like zippers. The dense stacking of SFAs contributes to the firmness of fats. Animal fats are typically high in SFAs and such fats as butter and lard are solid at room temperature. Since coconut oil contains a lot of SFAs, it is also solid at room temperature, even though it is derived from a plant. Saturated fats have a longer shelf life than unsaturated fats, and coconut oil is quite stable (McGee, 2004). The fatty acids found in coconut oil are of medium length, so they are called medium chain fatty acids, or MCFAs. The significant property of MCFAs is that the human body does not store them as fat (Assuncao et al, 2009; Oseni et al., 2017). In addition to its uses in food and cooking, coconut oil was also used for hair and skincare in the Marshall Islands (Barker, 2013).

Many people have (Rudiak-Gould, 2009) praised the coconut as an example of intelligent design because coconut juice is delicious, nutritious, and packed in its own container. It’s the “Marshallese soda”. While in the Outer Islands, coconuts are essentially free - just pick them off the tree - on Mājro people can buy them at kiosks already husked for about fifty cents apiece. Women do not usually climb coconut trees (Barker, 2013) so they would have to pay fifty cents or rely on a male relative to pick coconuts for them. Marshallese women don’t climb trees because in their culture, thighs are sexualized body parts that should not be exposed.

Coconut trees produce more sugary sap, called *jekaro*, than the deciduous maple and birch trees relied on by early Americans (McGee, 2004). *Jekaro* can be used directly as a sweetener for coffee, drunk like a soda, boiled down to make *jekmai*, syrup, or fermented with

wild yeast to make *jemanim*, toddy. *Ametōm̧a* is a sticky, tasty candy made from coconut meat boiled in coconut syrup. It is sometimes wrapped to make a lei-style necklace of small brown balls. *Ametōm̧a* features in the Marshallese legend surrounding WWII. Toward the end of the Japanese occupation of the Islands, food supplies were running so low that Marshallese people were forbidden to fish or forage under threat of execution. Many Marshallese people survived by eating *ametōm̧a*, which could be stored and hidden.

The Marshall Islands has been a major copra (dried coconut meat) producing entity (Wenkam and Baker, 1971) since the German administration. There is a Marshallese children's song about preparing copra to sell, *Lalem bag in waini* (Five bags of copra) (Johnson, 2013). Today, coconut agroforestry is less important to the economy of the RMI than it was in the previous century, but much of the land area is still planted mainly with coconut palms, interspersed with occasional breadfruit and pandanus trees. Thaman (2008) reports that a lot of the coconut farms are on uninhabited islets and many of them have been left in various stages of care. *Karkar* means to scrape copra from the coconut shell. It is hard work, usually performed by men. In the early 2000s, the payment for the copra produced by Outer Islanders was eleven cents per pound, backed by government subsidies (Rudiak-Gould, 2009). Barker (2013:18) laments that on the copra farms, "outer island residents work extremely hard for little money." Aside from the economic loss, another problem with promoting copra as an economic boost for the RMI is that its production detracts from subsistence practices. True, it gives people more money to spend on food produced by others. Then, in better health, the population grows and needs even more food (Pollock, 1992). Rudiak-Gould (2009:33) noted that "instead of turning the [coconut] meat into money that would then be turned back into food", some of the men on Wūjae Atoll simply used the coconut for food instead of copra. Scraping out the coconut meat then was to *raanke*, as opposed to *karkar*.

Many of the coconut trees on *Rongelap* Atoll that were exposed to radioactive fallout from the "Bravo Shot" in 1954 were killed or made sterile (Smith-Norris, 2016). Another

coconut-related hazard are ripening brown coconuts perched precariously thirty feet (9 meters) above one's head. It is important, when seeking a shady spot on the beach, to only sit under green coconuts, which are not likely to fall and cause harm (Rudiak-Gould, 2009).

Jekaro is a smooth, refreshing drink, especially when cooled in a pitcher with ice. One Marshallese woman I spoke to in Springdale compared it to Sprite. The soda however, does not contain the nutrients of the coconut sap.

FREE-LIST RESULTS

“All Marshallese foods? Wait a little so I can remember because there’s a lot to remember.”

Female, 43 years old, from Arno Atoll in the Republic of the Marshall Islands
(responding to verbal free-listing prompt)

To define and explore the domain, or category, of traditional Marshallese foods (or at least what people in Springdale consider to constitute said domain), I collected free-lists - twice. Items considered to be traditional foods may represent the collective group identity – both how Marshallese people see themselves and how they want to be seen by others. All of the items in the domain of traditional Marshallese foods need not be historically accurate according to Western concepts of tradition. The important thing is that all of the food items are united by a general consensus within the community that they belong to the domain. The domain of interest here has not previously been well-explored, not surprising given that food studies have only become wildly popular since about the 1980s and that the Marshallese community in Springdale tends to lie low, preferring to keep to themselves. In the past Westerners may have overlooked the significant changes in diet caused by political and environmental shifts because foodways are mundane. Only in recent decades has the type II diabetes epidemic in Pacific Islander communities become a major topic of concern in public health circles. And it has been even more recently that traditional Pacific Island foods such as coconut – and *most* recently breadfruit – have been declared “superfoods” in the West. Now the time is right to explore the domain of traditional Marshallese foods: What are the most important items it contains? How expansive is it? Which members of the community have the greatest knowledge of this domain? I will begin answering these questions by analyzing and interpreting my free-list data.

Free-listing is a cognitive task in which respondents are asked to come up with as many items belonging to a defined category as they can within a certain amount of time. For example,

a researcher may ask each of her respondents to list “medicinal plants”, “kinship terms”, “types of shoes”, etc. Free-listing is different from using a survey or questionnaire because instead of asking for a respondent’s personal views, it elicits general information about a domain that can be used to determine the views of the whole group. Anthropologists and others have been using free-listing as a data collection tool for decades. It allows the researcher to quickly and easily amass large amounts of information. Ethnobotanists have found the technique especially useful in learning about culturally significant plants and their uses. Free-listing is considered a good first step toward learning about a new culture.

I have one set of verbally collected free-lists that I recorded during the interview phase of my research and also during lunch with friends. This set consists of 34 total free-lists and is described in detail below. However, anthropologists agree that when possible, it is better to collect written free-lists. I have a set of 115 total written free-lists that I collected during the survey phase of my research, and which I will also further describe below. Although the two data sets closely agree, it is not possible to combine them. One reason is that a couple of the respondents consented to give an interview AND complete a survey. So, if I combined the data sets their duplicated lists would skew the resulting calculations toward their personal ideas about food rather than the notions of the group as a whole. Another reason not to combine the two data sets is because people recall things differently when they speak versus when they write (Kellogg, 2007). I also used different wording for the verbal and written prompts. These differences could lead to a comparison between apples and oranges, which of course is not possible unless you have asked someone to “Please list all the fruits you can think of.”

The Results in this chapter show that the distribution of knowledge about traditional Marshallese foods is rather evenly distributed throughout the Springdale community. As far as items within the domain of traditional Marshallese food are concerned, the outcome is interesting in what it implies about Marshallese concepts of food, tradition, assimilation, and cultural identity in Springdale. Another interesting component of this chapter is the application

of a brand-new method of calculating cognitive salience called B'. I will show how I did the calculations - if I can do it, anyone can do it – to determine saliences for all the items in my two data sets.

Verbal free-lists were collected during personal interviews with 32 Marshallese adult residents of Springdale (17 females, 15 males). Each respondent was given the choice of conducting the interview directly with me in English or with assistance from a Marshallese-English translator. The first interview question, which generated the free-list data, was, "Please list all the traditional Marshallese foods you can think of." Interviews were digitally recorded and then transcribed. Two additional verbal free-lists were collected over a lunch with friends, bringing the total set of verbal free-lists to 34 (19 females, 15 males). Of those who supplied verbal free-lists, 14 were from Urban Centers (UCs), meaning *Mājro* Atoll, and 20 were from Outer Islands (OIs), meaning all other atolls and islands in the RMI. Because of fluid family ties and intranational migration, many Marshallese people consider themselves to be "from" multiple atolls/islands in the RMI. If a UC *and* an OI were both declared home, then the respondent was considered to be from the UC. Respondent ages in this data set ranged from 18 to 80 years old with an average age of 37.8 years.

Written free-lists were collected during surveys with 116 Marshallese adult residents of Springdale. One survey respondent failed to write anything in answer to Question #4, "What are some traditional Marshallese foods?", leaving me with a total of 115 free-lists from 61 males and 54 females. Each respondent was given the choice of taking the survey in Marshallese or English. The Marshallese answers were translated into English using the standard dictionary (Abo et al., 1976) and other Marshallese-English resources such as Taafaki et al. (2006). For the written data set, 54 respondents were from UCs while 58 were from OIs, and 3 people did not record their home atoll(s). The age range for this data set was 11 years to 75 years with an average age of 36 years old. One person failed to report their age.

Although I was only able to survey a relatively small sample of the total Marshallese population of Springdale, it was ultimately adequate for assessment of general patterns because it represents youths and elders, OIs and UCs, and both genders.

The data were carefully cleaned and formatted. When possible, I used Marshallese terms for items to familiarize myself with the natural language of the domain. I met with different Marshallese speakers at various times to clean and re-clean the data until I had a basic understanding of each item. All item descriptions are listed in the Glossary of this work. I made separate text files for each data set using the Notepad application in Windows so I could import my data into VAP-FL. To take a closer look at the samples' demographics, I also made excel workbooks for each data set. Respondents were labeled randomly from 1 to 34 for the first data set and from 1 to 116 for the second data set, with their gender (M/F), Age (in years), and home atoll(s) recorded next to their numerical label.

Free-lists were analyzed using ANTHROPAC 4.0 (Borgatti, 1996) and Microsoft Excel. Although ANTHROPAC can be used to explore free-list data in various ways, the MS DOS program has a very steep learning curve. Fortunately, there is a bare bones version that runs in Windows, Visual Anthropac 1.0 – Freelists (VAP-FL), which is more user-friendly. I imported my text files into VAP-FL and had the program calculate the Frequency (%), Average Rank, and Saliency (S) for each item. In addition, the saliency for each listed item was calculated (using Microsoft Excel) using the formula described by Robbins, Nolan, and Chen (2017). Frequency (F) measures how often a word appears in the data set. Saliency is a better gauge of item importance than frequency because it takes the item's average list position into account in addition to how often it pops up. VAP-FL calculates saliency as Smith's S, which is usually highly correlated with frequency. Robbins et al. (2017) introduced B', a number between 0 and 1, to calculate the cognitive saliency of listed items in a way that better facilitates comparison between lists of various lengths. The free-lists I collected in Springdale are the first data to be subjected to the B' measure of cultural saliency.

Results

Items

For the verbal free-list set of 124 total mentioned items, the top ten most salient items are listed in Table 6.1 in order of highest to lowest B'. Notice that although **ek** appears in 2 more lists than **bob**, it has lower salience scores, indicating that it is usually listed further down the list than **bob**. Also note the differences between B' and S. The different salience calculations lead to the same rank order of the first seven items (**mā** to **pinana**), but they disagree as to whether **ni** or **keinabbu** is more salient.

Table 6.1. Top 10 most salient items for the verbal free list set.

Rank	Item	English	Frequency	Salience (B')	Salience (S)
1	Mā	Breadfruit	28	0.7270	0.658
2	Bōb	Pandanus	21	0.5310	0.476
3	Ek	Fish	23	0.5239	0.414
4	Bwiro	Fermented breadfruit	20	0.4279	0.313
5	Iaraj	Taro (giant swamp)	14	0.3143	0.254
6	Iu	Sprouted coconut	13	0.2999	0.248
7	Pinana	Banana	12	0.2676	0.236
8	Ni	Coconut	10	0.2021	0.152
9	Keinabbu	Papaya	9	0.1931	0.159
10	Lukor	Pounded meat of sprouted coconut	7	0.1327	0.099

On the opposite end of the spectrum, the verbal free-lists had 57 items listed only once, with 6 items having a B' of effectively zero.

For the written free-list set, the same nine most salient items (in the same order of highest to lowest B') are listed in Table 6.2.

Table 6.2. Top 10 most salient items for the written free list set.

Rank	Item	English	Frequency	Salience (B')	Salience (S)
1	Mā	Breadfruit	98	0.7715	0.686
2	Bōb	Pandanus	83	0.5773	0.464
3	Ek	Fish	80	0.5556	0.465
4	Bwiro	Fermented Breadfruit	56	0.3994	0.348
5	iaraj	Taro	61	0.3701	0.256
6	Iu	Sprouted Coconut (coconut "apple")	50	0.3193	0.231
7	Pinana	Banana	39	0.2500	0.190
8	Ni	Coconut	39	0.2414	0.181
9	Keinabbu	Papaya	38	0.2173	0.142
10	Peru	Pandanus/pumpkin pudding	28	0.1941	0.163

Again there are the expected differences between F and B' (*bwiro* and *taro*). And again S and B' seem to disagree on the salience rankings of items, even though they both yield the same top 9 items, and the same top 9 items as the verbal free-lists. The written 114 item data set included 27 items that were listed only once. So it displayed a higher degree of consensus than the verbal free-lists, which makes sense given the larger sample size. Again six items had a B' of effectively zero.

Respondents

For the first data set, consisting of 34 verbally collected free-lists, respondents listed a total of 124 items and the list lengths ranged from 2 to 33 items with an average list length of 11.6 items.

For the second data set, which consisted of 115 written free-lists, the total number of items was 114 and the list lengths ranged from 1 item (*peru*, or pandanus/pumpkin pudding) to 17 items with the average list length being 8.7 items.

Discussion

Items

Both the verbal and written free-lists generated the same nine most salient items, in the same rank order of B'. The most salient item was **mā**, or breadfruit (*Artocarpus altilus*). The second most salient item, after **mā**, was **bōb**, or pandanus (*Pandanus fischerianus*), also called screwpine. These two Dr.Seuss-drawn fruits are the starchy staples of the pre-contact Marshallese diet. Marshallese people in Springdale talked about craving them.

Ek, or fish, was the third most salient item. Berlin (1973) might note that the term “fish” is on a different folk taxonomic level (life-form) than the plant foods that were listed (generic). That is to say, people were not as specific about what types of fish they considered to be traditional Marshallese foods. Although some other seafoods were mentioned at the generic level (lobster, conch, . . .) or even the specific level (giant clam, coconut crab, . . .), very few detailed descriptors were offered for fish. The issue is not that Marshallese people don't have a large taxonomy and intricate vocabulary with which to talk about fish. At the Consulate General's Office for the Republic of the Marshall Islands in Springdale, there are several large posters printed with colorful photos of reef fish and their names in both English and Marshallese (see Figure 6.1).



Figure 6.1. Two of the posters of Marshallese fish that hang in the Consulate's Office in Springdale.

The real reason I believe that the people I talked to and surveyed did not list a plethora of fish species is because I didn't ask about "fish". I asked about "foods". Americans may be inclined to equate protein (MEAT) with food, but Pacific peoples follow a different general meal model. Pollock (1992) notes that the Marshallese word *mōñā*, meaning both food and eat, refers to starchy staple plant foods. These foods are primarily *mā*, or breadfruit, in the summer and *bōb*, or pandanus, in the winter. A tendency to cluster plant foods together could also have contributed to the under-reporting or down-ranking of fish. For example, *mā* and *bōb* were more frequently listed one after the other (like peanut butter and jelly) than and *ek* (peanut butter and marshmallow fluff perhaps?).

Moving on down the list of the top 9 most salient items, *bwiro*, or fermented breadfruit, was next. Then there is *laraj* is the Marshallese name for giant swamp taro (*Cyrtosperma chamissonis*). In English, Marshallese people will refer to this starchy plant as just "taro", even though it is not the most common of the world's taros. *lu* is the sprouted coconut, also referred to as the coconut "apple". *Pinana*, or banana (*Musa spp.*), also called *keeprañ*, grows mostly in the southern parts of the Marshall Islands. *Ni*, or coconut (*Cocos nucifera*), provides the healthy fats of the traditional Marshallese diet. *Keinabbu*, or papaya (*Carica papaya*), is a relative newcomer to the Marshall Islands and a very valuable fast-maturing source of phytonutrients. For more information about the above foods, and other important items in the domain, please see The Foods chapter in this book. Still, this study is just a humble stumble into the complex and delicious Marshallese food culture and not an exhaustive or inflexible collection of their foods.

Bernard (2011) suggests that a good rule of thumb for setting the boundaries of a cultural domain is to take the items listed by the top 10 % of respondents. For the verbal free-lists, 27 items were listed by at least 10% of respondents. For the written free-lists, 21 items were listed by at least 10% of respondents. There were 17 items in common between the top

10% of items for both data sets. These 17 items should then be considered to comprise the core domain of traditional Marshallese foods. See Table 6.3.

Table 6.3. Core items comprising the domain of traditional Marshallese foods in Springdale

Item Name (Marshallese)	English
Ma	Breadfruit (<i>Artocarpus altilus</i>)
Ek	Fish
Bob	Pandanus (<i>Pandanus fischerianus</i>)
laj	Taro (<i>Cyrtosperma chamissonis</i>)
Bwiro	Fermented Breadfruit
lu	Coconut “apple”
Pinana	Banana (<i>Musa</i> spp.)
Keinabbu	Papaya (<i>Carica papaya</i>)
Ni	Coconut (<i>Cocos nucifera</i>)
Peru	Pandanus/pumpkin pudding
ṁakṁōk	Arrowroot (<i>Tacca leontopetaloides</i>)
Baru	Crab
Baañke	Pumpkin (<i>Cucurbita pepo</i>)
Bao	Chicken
Raij	Rice (<i>Oryza sativa</i>)
Wōd	Clam
Aikiu	Coconut soup

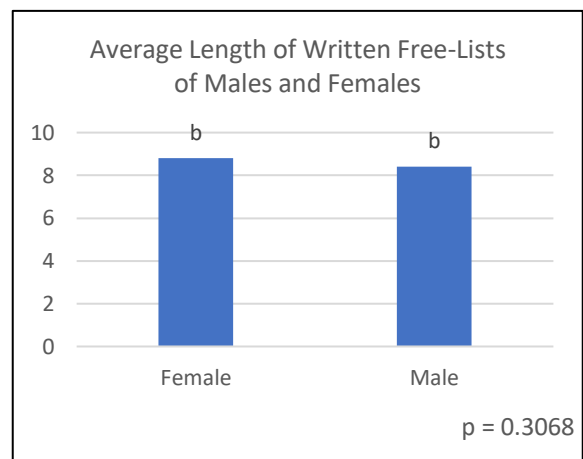
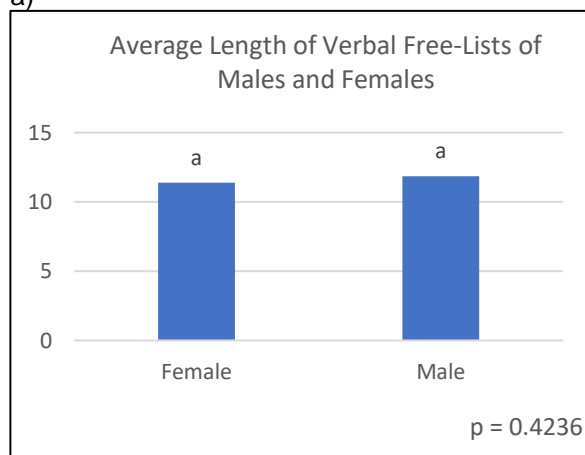
But that means: For the verbal free-lists, 86% of the items were listed by less than 10% of respondents. For the written free-lists, 85% of items were listed by less than 10% of respondents. For both data sets, the core of the domain made up only about 15% of the items! Although we can be fairly certain that these core items are important, the data also indicates that there is some gray area surrounding the legitimacy of other “traditional” items. It is interesting to note that 2 foods which are not endemic to the RMI but very common in Springdale, **bao**, chicken, and **rai**j, rice, are squarely within the domain. Meanwhile, some other popular dishes such as **ametōma**, coconut candy, and **kweet**, octopus, which are prepared

from endemic ingredients and figure prominently in Marshallese myths and legends are not included in the core domain.

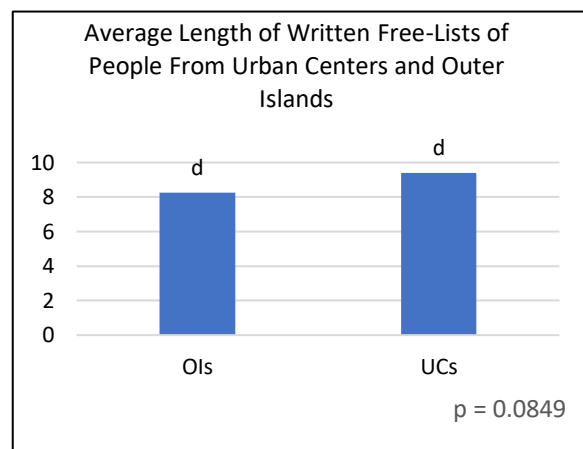
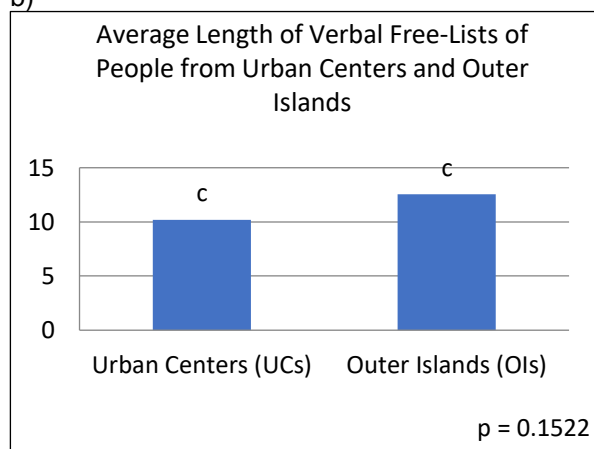
Demographic Differences or Not?

I looked at differences between gender, age group, and home atoll for both data sets. Using list length as a proxy for amount of knowledge, I found no significant differences between the list lengths by gender, age, or home atoll (the Urban Centers, UCs, of Mājro and Ebeye vs. the Outer Islands, OIs) (Figure 6.2).

a)



b)



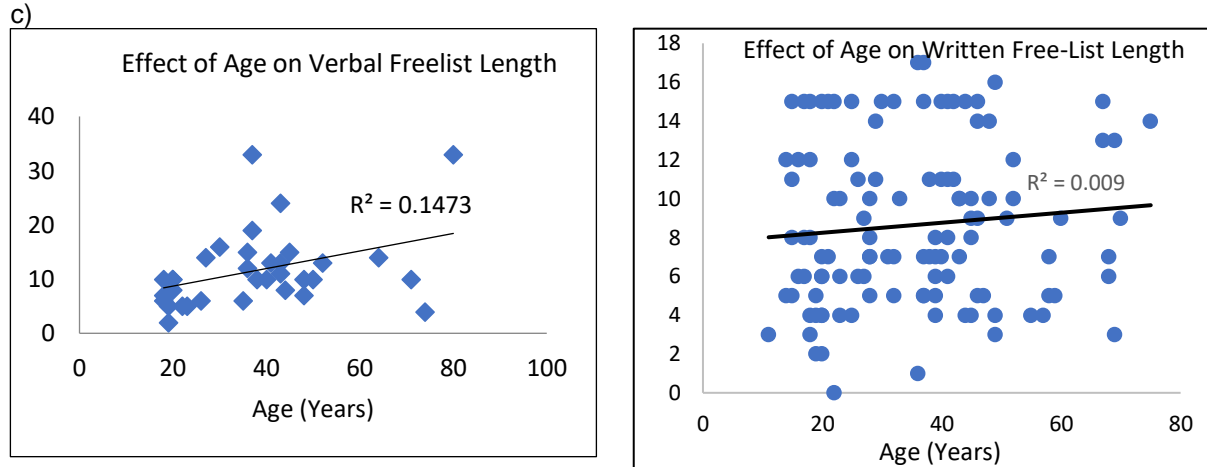


Figure 6.2. Statistical analyses showing no significant differences in free-list lengths between a) Males and Females, b) OIs and UCs, and c) Respondents of different ages for both the verbally collected and the written list sets.

Perhaps if the length of residence in the US had been recorded for each respondent, there may have been significant differences in list length (between the recent arrivals and the well-established). That assumes that the Marshallese migrants in Springdale follow assimilation patterns similar to those of other new immigrant groups. However, from what I've read and heard about food in the RMI, at least in the UCs it may be very similar to the food in Springdale, because of the colonial history and the available foodstuffs. And there was no significant difference between the list lengths of people from the OIs versus those from the UCs.

No large-scale trends were found in either data set. I spent some time searching for more subtle patterns. For example, what if it appeared that elderly females from say, Arŋo Atoll, tend to list **baañke**, or pumpkin, most frequently? Unfortunately, I could not discern any such small-scale trends. The only slight correlation I noticed was that people who listed more items were more likely to include obscure items, but that is obvious. Although it's likely that a handful of people will have specialized knowledge (a unique hobby or secret passion), it's much more likely that specialized knowledge will be held by someone who is generally knowledgeable in the given field.

Concerns

In verbal free-lists, respondents tended to mix English and Marshallese names for various food items. For the sake of homogeneity, all words were translated to Marshallese as part of the data cleaning process. In some cases there were different words for the same dish from different Marshallese dialects (*wijpil/pilolo*, a type of banana pudding), or different dishes with the same name (*jāānkun/mokwan*, a type of fruit leather made from either breadfruit or pandanus). In these instances I chose the more common Marshallese term for the dish (*wijpil*), or used a regional name for the variant dish (*mokwan* for breadfruit leather, *jāānkun* for pandanus leather). Unfortunately, I could not afford to pay a Marshallese person to write my dissertation for me, so I had to make some assumptions. However, I believe that the information deemed correct by Marshallese fact-checkers outnumbers any incorrect assumptions made by me.

In addition to language differences, I had to overcome cultural differences. Marshallese verbal pauses are longer than American verbal pauses (Hezel), re-enforcing the stereotype of the laid-back Islander. When collecting verbal free-lists I tried to be more patient than my East-Coast temperament usually allows, so as not to cut anyone off mid-list.

Another dark side of the friendly, compliant Islander stereotype is their possible biased way of telling me what I want to hear. For example, the most common type of fish people gave me was ***bwebwe***, tuna. I can't be entirely sure whether that is because ***bwebwe*** is the most salient Marshallese fish – it does figure prominently in many traveler's accounts of fishing and dining in the RMI – or just because as a Euro-American, tuna is what I'd be most familiar with and people wanted to relate to me.

For collecting written free-lists, the survey had 15 "blanks". This might have limited some people who could think of more than 15 items in a short time to stop the task before they were done with it in their minds. A few people did list more than 15 items, squeezing the words

in underneath or beside other words on the same line. A greater concern was that the blanks were arranged in a 3 x 5 matrix. Therefore, for the surveys with 15 or so items, it was sometimes unclear whether the respondent filled in the survey across-then-down, or down-then-across. At these times I used my best judgement and the cultural consensus theory to make an educated guess at the intended item ranking.

Finally, I noticed that the snowball sampling method had a tendency to recruit relatives from the same atolls. Although I had respondents from UCs, that generally meant *Mājro* Atoll. For the verbal free-lists, I met no one from *Ebeye* – one of the world’s most densely populated islands, where almost 20% of the RMI population resides (about as many Marshallese people as there are in Springdale). I did have 7 (6%) respondents from *Ebeye* in my larger, written data set. Again I have to question my research. Do people from *Ebeye* not migrate to Springdale in as large numbers as people from other parts of the RMI, or is my sample skewed?

Conclusion

The relatively even patterns of distribution of knowledge (using list length as a proxy) shows that there is not a great deal of variation in how knowledge of food is partitioned in the study community. That is, unlike other forms of knowledge in the pre-contact Marshall Islands, such as navigating and treating illness, food knowledge was not carefully guarded and only entrusted to certain families. Even today, there are not many Marshallese celebrity chefs, who have mastered a number of traditional and novel dishes. Most Marshallese people know the same things about their foodways, which is great because that knowledge is being conserved with the younger generation. Similarly, Marshallese men may sit back and let their female relatives and wives prepare the food, but in a pinch, they would have the knowledge to do so themselves. The fact that there is a core group of foods that most everyone agrees on indicates

that those are the most culturally important foods, epitomizing the Marshallese culture in Springdale.

The disturbing fact is that the foods that are most important to Marshallese people in Springdale, the foods that they most identify their culture with, are not so easily found in Springdale.

The solid core of items in the results is followed by a long tail of once-mentioned items indicating some possible dissolution of Marshallese food culture occurring presently in Northwest Arkansas. More is perhaps known about what Marshallese food *is* than what it *isn't*. For example, this analysis shows that **mā** is considered a traditional Marshallese food. But items such as **ametōma** and **SPAM** that have almost mythological significance in the culture are outside of the core of the domain. They, and other items in the gray area (listed by a few respondents from each data set), are certainly considered traditional Marshallese foods - to some people. As assimilation into the broader Springdale community continues, will more items from the core domain fade away into the sphere of popular American culture? That is unlikely for two reasons: First, there was no significant correlation between age and list length, implying that the younger generations still value the same foods. And secondly, there was no significant difference between Urban Centers, UCs, and Outer Islands, OIs, either. That indicates that even when development has displaced certain foods, their cultural significance remains high. Also, continued migration from RMI is bound to bring in people with these same ideas about foodways and an increase the demand for the core foods in NWA. It is highly likely however that more items from the local environment will be incorporated into that same gray area, causing the tail to extend even further. For example, as people experiment with substitutions and novel foods, and try foods prepared by friends from El Salvador, Laos, and the Ozarks, these foods will probably creep into their routines and thus into their ideas of “tradition”.

The limitations of this study were firstly language and secondly sample size. Future research may entail collection of more data to compare with the free-lists obtained in the

present study. I would love to collect free lists using the same prompt (“Please list all the traditional Marshallese foods you can think of.”) in both Urban Center, UC, and Outer Island, OI, villages in the RMI. Or in Springdale, it would be very interesting to compare free-lists from different immigrant groups, such as Salvadorans (“Please list all the traditional Salvadoran foods you can think of.”), to the Marshallese people’s free-lists. Of course I would also, as my friends suggested, be sure to collect another set of free-lists from Marshallese respondents who can record the amount of time they have lived outside the RMI. Understanding food culture, whether away, or at home is ultimately a work in progress requiring understanding, appreciating, and paying attention to what people eat together.

CLUSTERING

“One of these things is not like the others. One of these things just doesn’t belong.”

Sorting song from *Sesame Street*, by Joe Raposo, Jon Stone and Bruce Hart

PILES

After free-listing, pile sorting is usually the next step in cognitive anthropology research methods, as seen in the work of Reyes-García et al. (2013). Of course pile-sorting can also be done independently of free-listing, as seen in the work of Boster and Johnson (1989), Lutz (1982), and Trotter and Potter (1993). Like free-listing, pile-sorting is easy to do and has the elements of a fun logic game. The only downside is that it takes a bit more time, so one needs to recruit patient respondents. The Single Free Pile-Sorting task involves asking participants to place index cards, representing various items within the same domain, into piles as they see fit.

De Munck (2009:67) writes that pile-sorts are great for understanding prototypes, which he goes on to define as “a mental image or model constituted of the most salient features of a typical member of a category.” And he gives some examples (the prototypical bird, ball, and emotion). Additional examples of prototypes would be a “Sneaker” as more of a prototypical shoe than a “Snowshoe”, a “Diamond” as a more prototypical gemstone than a “Tourmaline”, and an “Apple” as a more prototypical fruit than a “Lychee” (at least in American culture). Items that cluster together closely tend to fit the prototype better than items that are farther removed, called *semantic extensions*. For example, a sneaker is a prototypical type of “Casual” shoe. It is made of cloth instead of leather, has no heel, and laces up. A semantic extension type of “Casual” shoe would be an oxford. The oxford has no heel and laces up, but it is made of leather, so it does not fit all of the typical “Casual” shoe criteria. It is closer to being a “Dressy” shoe, but not as close to “Dressy” as a high-heeled shoe that was made of leather and did not

have faces. Pile-sorting can reveal the criteria that are important for determining the prototype and semantic extensions of a group or subgroup.

The results of the pile sort are converted into a matrix depicting how often any two items get placed into the same group. This matrix is called the aggregate proximity matrix. The data can then be visually represented using multi-dimensional scaling (MDS) and hierarchical clustering. The MDS provides more of a holistic view of the data whereas the hierarchical clustering shows more subtle details.

Although several different computer programs can be used to create an MDS map, they are limited to visually showing the relationship between items. That means that the computer program can't determine what the two or more dimensions of the map are. Figuring that out, drawing the circles around different groups, and picking a valid prototypical item are tasks that are ultimately left up to the human researcher.

Choosing valid groups, or clusters, of items can be difficult, especially when dealing with many items. The more items one has, the more potential groups there are. When in doubt however, it is better to have too many groups than too few groups, as long as there is information about the distinctions between all the groups.

Pile-sorting is useful for more than just theoretically understanding the structure of semantic domains. Trotter and Potter (1993) used this method to evaluate public health programs for at-risk teens in Arizona.

Once I had collected 21 free-lists, I used Visual Anthropac-Freelists to look for the top 20 most salient items. In my case, there were a few items that had similar salience scores, so I ended up using the 22 highest-ranking items for the pile-sorts. I wrote out the items in both Marshallese and English (as appropriate) on a set of index cards and then I shuffled the cards and assigned each one a number from 1 – 22. The key is shown in Table 7.1 below.

Table 7.1. The 22 items used for the pile-sorting task and their code numbers

Number	Food	Definition
1	<i>Raij/Rice</i>	<i>Oryza sativa</i>
2	<i>Keinabbu/Papaya</i>	<i>Carica papaya</i>
3	<i>Bwiro</i>	Fermented breadfruit
4	<i>Piik/Pork</i>	Pork
5	Seafood	Seafood
6	<i>Iaraj/taro</i>	<i>Cyrtosperma chamissonis</i>
7	<i>Ni/Coconut</i>	<i>Cocos nucifera</i>
8	<i>Pinana/Banana</i>	<i>Musa</i> spp.
9	<i>Bob/Pandanus</i>	<i>Pandanus fischerianus</i>
10	<i>Iu</i>	Sprouted Coconut
11	<i>Ek/Fish</i>	Fish
12	<i>Jokkwōp</i>	Breadfruit/Rice soup
13	<i>Ma/Breadfruit</i>	<i>Artocarpus altilus</i>
14	<i>Lukor</i>	Pounded (iced) <i>Iu</i>
15	<i>Taituuj</i>	<i>Pinana</i> "fritters"
16	<i>Baru/Crab</i>	Crab
17	<i>Aikiu</i>	<i>Iu</i> (and arrowroot) soup
18	<i>Wijpil</i>	<i>Pinana</i> pudding
19	<i>Ek Boiled/Boiled Fish</i>	Boiled Fish
20	<i>Peru</i>	Pandanus/Pumpkin pudding
21	<i>Jaajmi/Sashimi</i>	Prepared raw fish
22	<i>Jeno/Clam</i>	Clam

I made 2 additional sets of cards and I conducted the pile-sorts with them at homes and meeting places of Marshallese people in Springdale. Participants were given a set of cards and asked to "Please put these cards into piles" in English by me, or in Marshallese with the help of a translator. If there was any confusion, the advice was kept simple, "You can make as many or as few piles as you want." "You decide how to put them into groups." When participants had finished making piles, I recorded the numbers on the cards in each of their piles and had the sorter briefly explain why they grouped the cards into each of their piles. After completing the

task participants were thanked and offered a candy bar of their choice. Cards were shuffled between uses.

Twenty-one people completed the pile-sorting task (13 females, 8 males), ranging in age from 11 to 75 years old with an average age of 32 years and a median age of 23 years old. The majority of the sorters were from the Outer Islands (OIs), with only 5 people from the Urban Centers (UCs), namely *Mājro* Atoll. However, ten different OIs were represented by the 16 outer islanders (*Aelōñlaplap*, *Arņo*, *Pikinni*, *Jālooj*, *Likiep*, *Mejit*, *Namdik*, *Rongelap*, *Utrōk*, and *Wotje* Atolls). Therefore the demographic variation among sorters was relatively high. On average, they sorted the 22 items into 6 piles. An example pile sort (that of the first respondent) is shown in Figure 7.1.

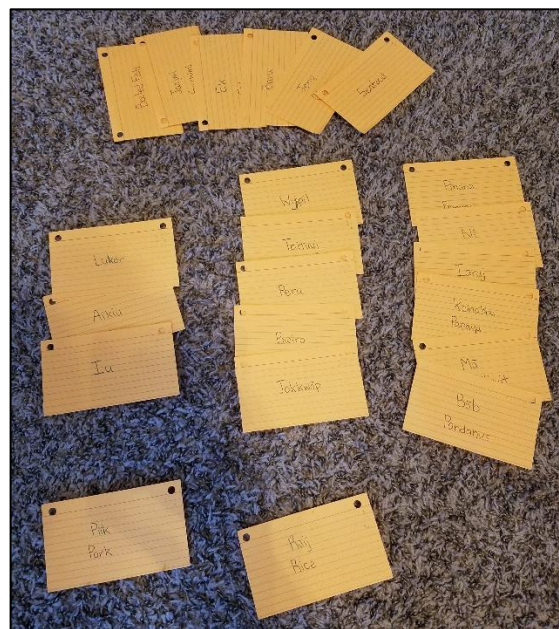


Figure 7.1. The results from the first pile-sort

Using the Crimson Text Editor application in Windows, I created a text file for my pile sort data. “*Ek Boiled/Boiled Fish*” was shortened to just “*Boiled*” for programming purposes. I used ANTHROPAC to create the Aggregate Proximity Matrix (AGPROX) file and UCINET, which can share files with ANTHROPAC, to create the Non-Metric Multi-Dimensional Scaling (NMMDS) plot and clustering hierarchy for the items. I also used Visual Anthropac – Pile Sorts

(VAP-PS) to create the same NMDS plot for my items, as well an additional plot showing the sorting relationships between my respondents. I interpreted the dimensions of the NMDS plots for my items based on my literature review and on my experiences in Springdale. Finally, I had four different researchers check my interpretation of the dimensions. I divided the items into groups based on my ethnographic research.

I did not pre-test the pile sorts. Now I realize that I should have done that because some people were confused about the term "*Baru*/Crab". It turns out there are two types of *Baru*, one on land and one in the sea. This caused some people to question where to put it. However, overall the primary categorical distinction was not "Land vs. Sea" but "Meats vs Non-meats", so I don't believe the "*Baru*" issue significantly complicated the results. Another issue was the dialectical difference of "*Jeno*/Clam", because in some places in the RMI, Clam is not "*Jeno*", it is "*Wōd*", or "*Jenō*". However, this did not cause any confusion in the sorting task, it just made me look uninformed. Most dialects in the RMI are mutually intelligible because of the long tradition of travel between islands/atolls.

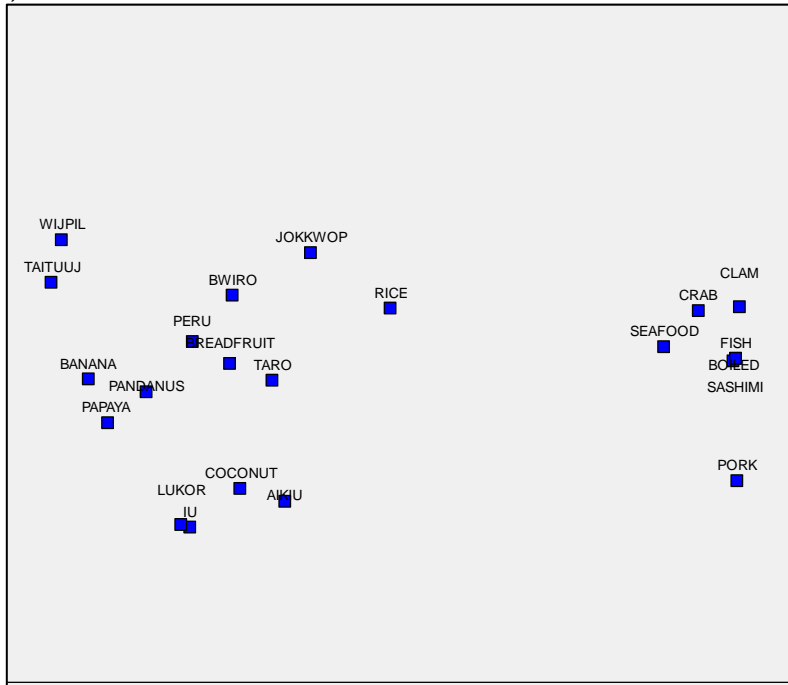
Results

Items - Multi-Dimensional Scaling

Figure 7.2a shows the Non-Metric Multi-Dimensional Scaling visual created by UCINET. VAP-PS also created an NMDS plot for my 22 items, reflecting how often respondents sorted them into the same groups (Figure 7.2b). The stress values were 0.041 for 2a and 0.045 for 2b. These values, which are not significantly different, are well under De Munck's (2009) maximum allowed stress of 0.16. This indicates that two dimensions are sufficient to represent the data. Note that these graphs are very similar, but not identical - the biggest difference is that 2b appears to be upside-down. The multi-dimensional scaling procedure is "notoriously unconcerned with details like this (Bernard, 2011:354)." As long as the relative distances

between the items are maintained, they can be oriented in any direction. For my analyses, I will use 2a.

a)



b)

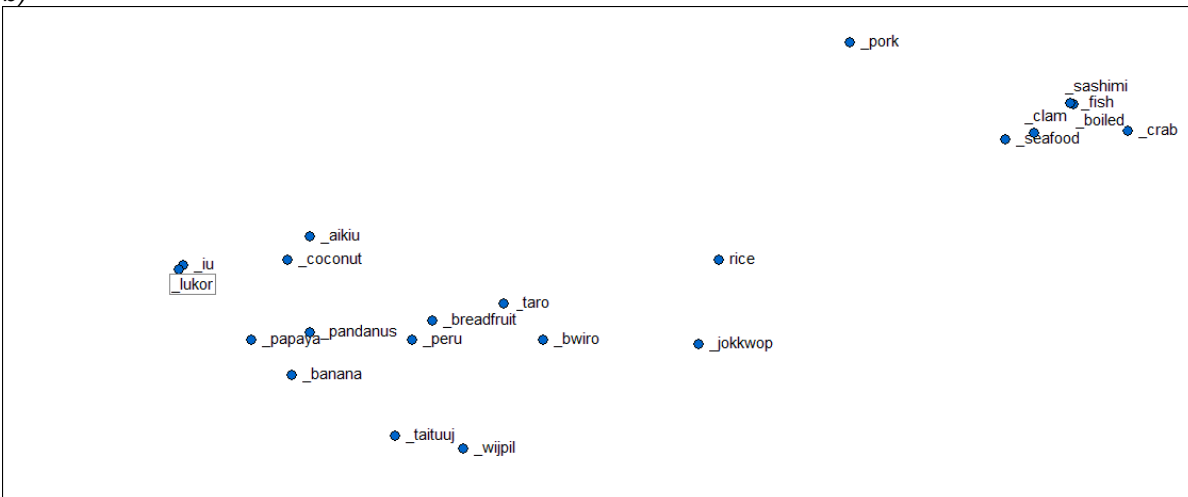
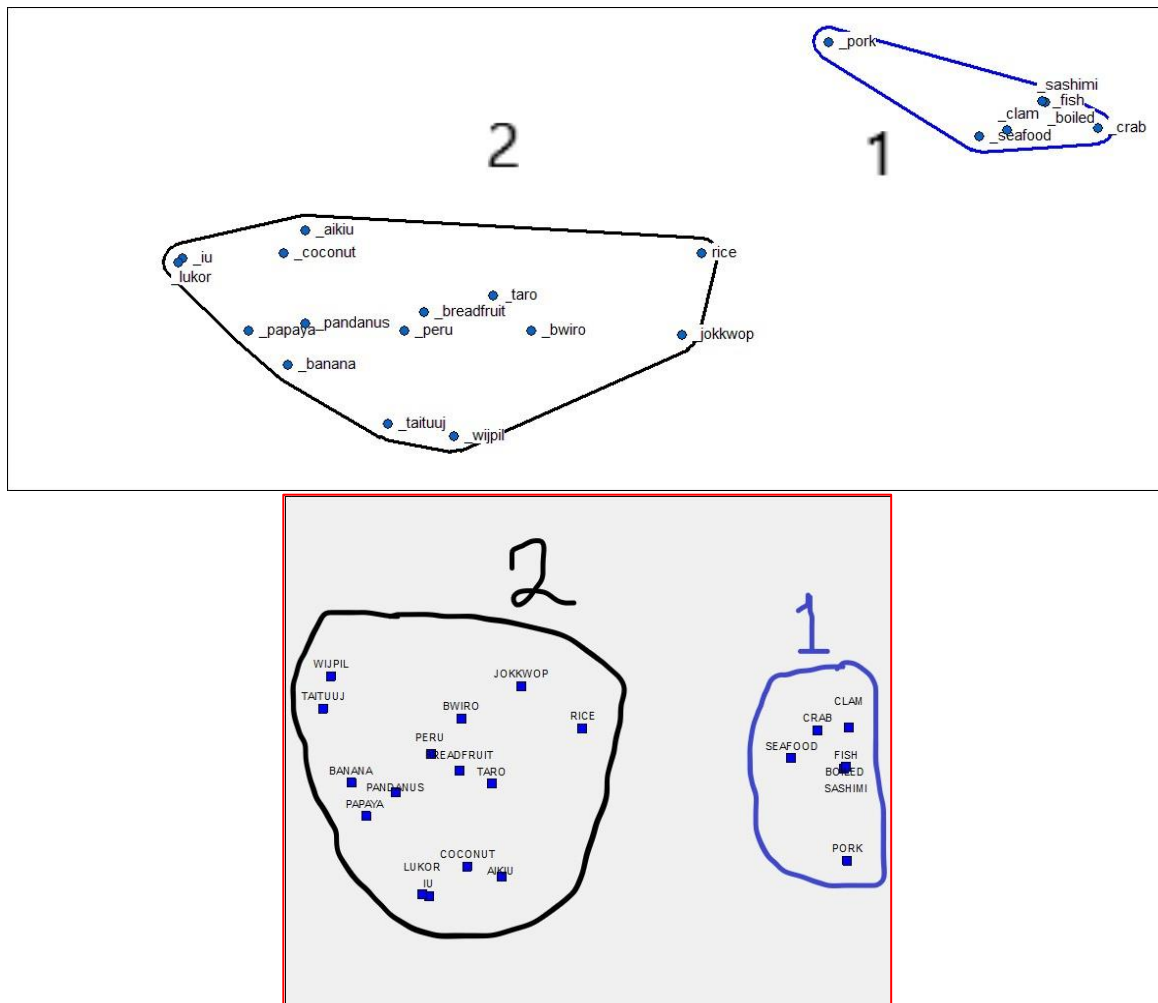


Figure 7.2. NMMDS Maps of the sorted items generated by a)UCINET and b)VAP-PS

The left-right dimension of plant-based foods to meats is very strong. The items clearly cluster into two main groups: “Meats” and “Vegetarian Foods”. The top-bottom dimension of the plot is a bit more challenging to interpret. One possibility is that it moves from less common foods to more common foods – but rice is troublesome to that interpretation. Another possibility

could be the transition from more prepared foods to more natural ingredients, but then pork becomes a problem. It may be that the answer lies somewhere between those two possibilities, being that complicated Marshallese dishes are likely less commonly available in Springdale.



Group 1 contains all the “Meats”: *Piik*/Pork (4), *Jaajmi*/Sashimi (21), *Ek*/Fish (11), *Ek Boiled*/Boiled Fish (19), *Jeno(Wōd)*/Clam (22), Seafood (5), and *Baru*/Crab (16). Group 2 contains all the “Plant-based Foods”: *Iu* (10), *Lukor* (14), *Aikiu* (17), *Ni*/Coconut (7), *Keinabbu*/Papaya (2), *Pinana*/Banana (8), *Bob*/Pandanus (9), *Peru* (20), *Ma*/Breadfruit (13), *Iaraj*/Taro (6), *Bwiro* (3), *Taituuj* (15), *Wijpil* (18), *Raij*/Rice (1), and *Jokkwōp* (12).

If VAP-PS is asked to further divide the items, first it singles out the banana-based foods (*Pinana*/Banana, *Taituuj*, and *Wijpil*) to make three groups. Next, to make four groups, the program pairs *Raij*/Rice with *Jokkwōp* in their own little group. Then to make five groups, the program singles out *Piik*/Pork, and finally, to make 6 groups – the average number of groups my respondents made – the coconut-based foods (*Ni*/Coconut, *Iu*, *Aikiu*, and *Lukor*) are grouped together.

The way I chose to divide the items into 6 groups is shown in Figure 7.4. There is a group of “Seafoods”, “Pork” is in a group by itself, *jokkwōp* and rice are together in the “Rice” group, *wijpil* and *taituuj* are in the “Banana-based dishes” group, but banana clusters with the other “Staple Plants” (the largest group, outlined in black in Figure 4), and finally there is the “Coconut” group.

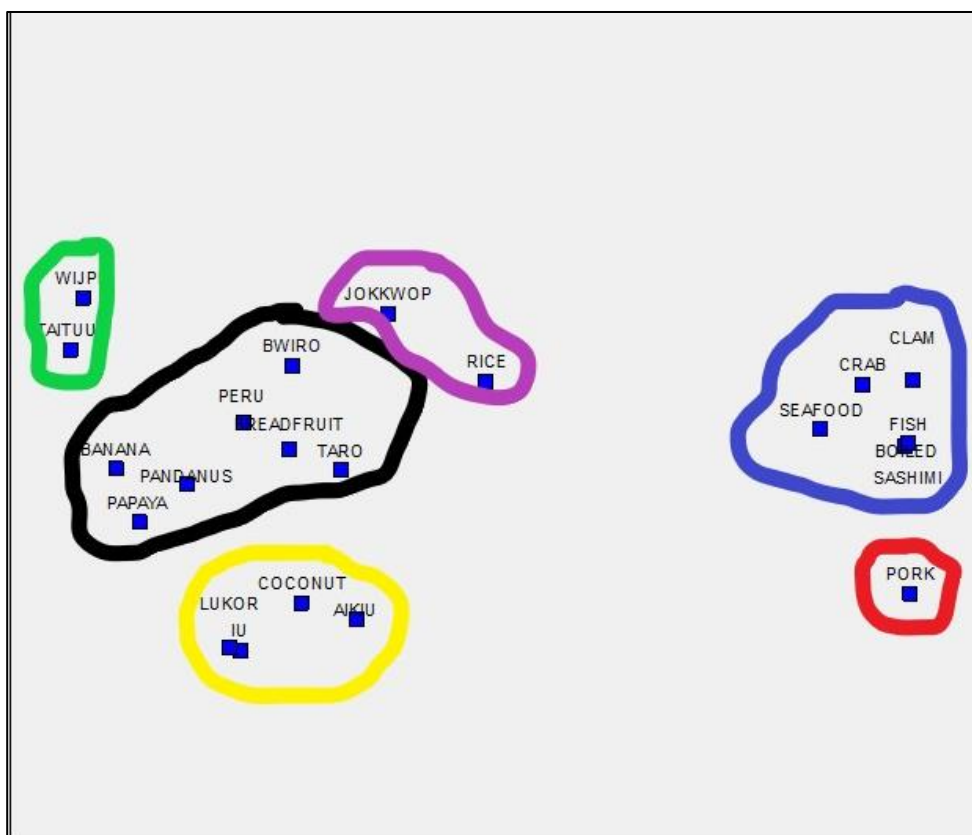


Figure 7.4. Visual interpretation of item clustering based on ethnographic information

Items – Hierarchical Clustering

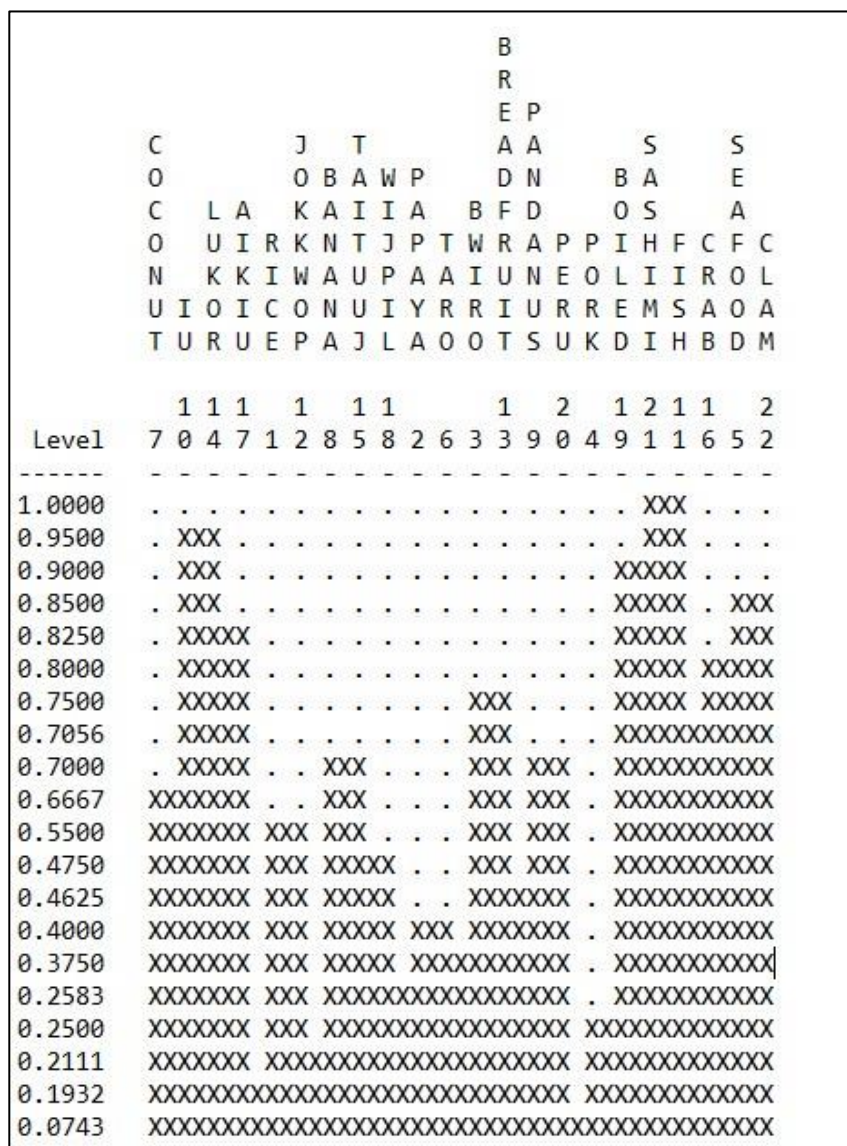


Figure 7.5. Cluster Diagram

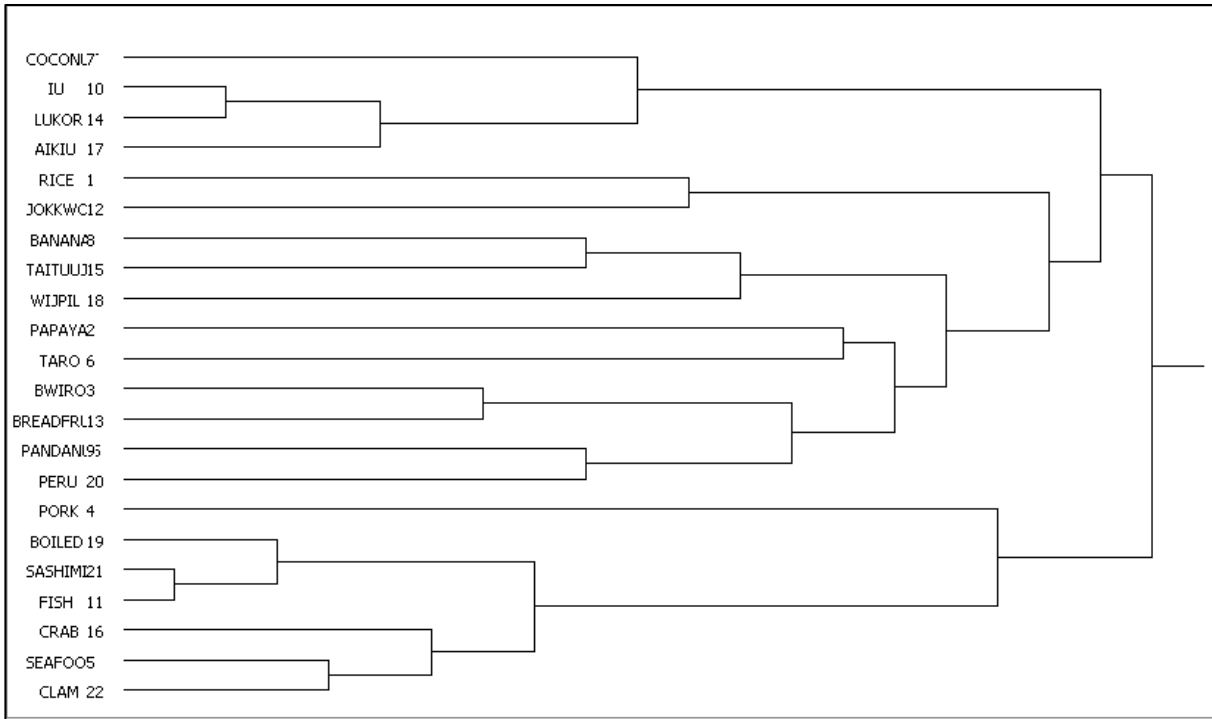


Figure 7.6. Dendrogram

Figures 7.5 and 7.6 further validate that decision to group the items as shown in Figure 7.4. Hierarchical clustering is more sensitive to “cultural and linguistic nuances of meaning” than MDS (Lutz, 1982:120).

Respondents

VAP-PS is also able to turn pile sort data into a map showing the agreement between people (Figure 7.7). The stress on this plot was 0.065.

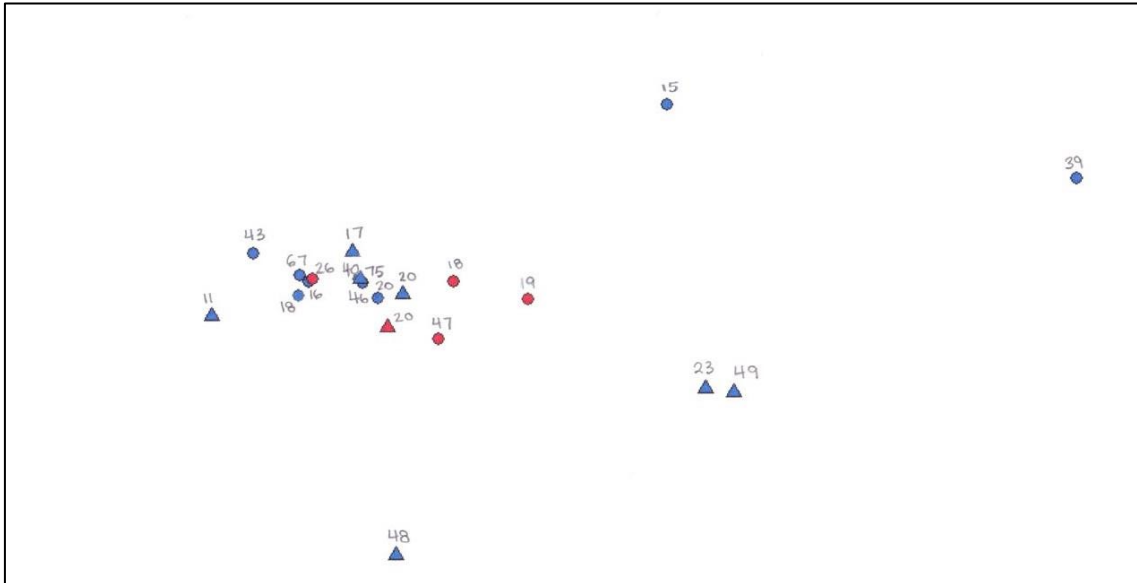


Figure 7.7. Map of the item sorters. Circles represent female respondents and males are represented by triangles. Red coloring indicates that the respondent hails from an Urban Center (UC) in the RMI and blue symbols stand for respondents from the Outer Islands (OI). Respondent ages (in years) are shown next to their symbol.

Seventy six percent of the sorters cluster relatively close together. However, there were a few single outliers, plus a rogue pair from Arņo Atoll.

Discussion

Items

There was not a large amount of variation in the items chosen for the pile-sorting task in that they are all “foods”. Therefore, the results of this project differ from those of ethnobotanical surveys such as Reyes-García et al. (2013) where perhaps some items are “foods” and others are “medicines” or “building materials”. To group the various food items, the distinctions were more subtle. Also unlike Reyes-García et al. I did not create overlapping groups.

I agree with VAP-PS about the first partitioning of items into two large groups, 1) “Meats” and 2) “Plant-based foods”, because of what I learned in my literature review about the division of Marshallese foods into *m̄ōñā* (starchy staple) and *jālele* (sauce). However, according to Pollock, coconut also functioned as part of the *jālele*, and according to the data I collected,

coconut and its related products are more closely related to the other vegetarian foods than to the meats. There is a small distinction that can be seen when the vegetarian group (2) from Figure 7.3 is subdivided into smaller groups in Figure 7.4.

There is no apparent overall division between “Marshallese” foods and “Other” foods. Rice groups with the vegetarian foods, especially the soup, *jokkwōp*, and pork groups with the meats. Several years ago I asked a South Korean friend if she liked American movies. “What?” she replied, not understanding. South Koreans don’t make a distinction between movies made in South Korea and those made in Hollywood. Westerners are so conditioned to see the products of other cultures as “foreign” that we often mistakenly assume that foreign peoples view our products with the same suspicion. The question of how much we “own” our own culture arises here since Marshallese people in Springdale have incorporated both rice and pork into their existing food concepts. Rice and pork are at least as Marshallese as the banana-based dishes, *wijpil* and *taituuj*. Not prototypical Marshallese foods, but Marshallese foods nonetheless.

The fact that the banana-based dishes can themselves be separated out is illustrative of regional variations in diet. Bananas are only widely grown in the Southern region of the RMI (especially Namdik Atoll) where the climate is relatively warmer and more humid than the North.

The fact that sashimi and fish were sorted together 100% of the time could mean that the terms are synonymous. Pre-testing the pile-sorting task with a subset of respondents following the procedures of Lutz (1982) could have revealed this redundancy.

For group 2, the vegetarian foods, breadfruit is squarely in the middle of the group. This result is not surprising given the salience (B') determined for breadfruit in the previous chapter. It would be more difficult to pick a single prototype for group 1, the meats, because of the funky shape of the group. However, it is not necessary to single out any specific item in either group as the prototype. It is good enough to have a general region where the items cluster. Items in that region may be said to be closer to the prototype than items that are farther away from it.

Therefore fish is a better prototype for a Marshallese meat than pork. However, all of the items in the Seafood group should fit the same criteria, so it would be difficult to argue that fish is any more of a Marshallese Seafood than clam or crab.

I did conduct the pile-sorts for this project before I had finished collecting the free-list data. I felt I had enough data to skim off the top items onto notecards, and anyway the pile-sort isn't as much about the content of the domain as it is about examining thought processes that determine the relationships between items. However, because of my timing, some of the terms that made it to the notecards were not part of the final core domain. If people didn't know what the items were, they often chose to make a separate group for them. The food most likely to be sorted into the "*Ijaje*/I Don't Know" group was *wijpil*, a banana dish sort of like a pudding. Thirty-eight percent of the sorters (8 people) were unfamiliar with the dish and grouped it in to a catch-all pile.

Respondents

To discover what might be isolating people from *Ar̄no* Atoll, I took a closer look at their free-lists and survey answers. Seven of the survey-takers listed their home atoll as *Ar̄no* alone. These seven people did seem to strongly agree with each other in their survey answers and free-lists, however, they did not significantly disagree with the group as a whole. Nor did the subset of people from *Ar̄no* Atoll seem any more in agreement than other subsets, such as the 8 people who indicated that they were from *Wotje* Atoll alone.

Two types of problematic respondents one may encounter when conducting pile-sorts are Lumpers and Splitters (Bernard, 2011). Lumpers make relatively few piles (lumping the cards together) and Splitters make too many piles. I encountered a couple of Lumpers (no Splitters) in my data collection. Not surprisingly, one Lumper created the 2 groups "Meats" and "Go-Withs" which were equivalent to the first 2 groups I created. The other Lumper used different criteria however, creating the 2 groups "Likes" and "Dislikes". Lumpers and Splitters

often use more creative categories than the other respondents. Some of the important categories that were more typically used besides “Seafoods”, “Meats”, and “Fruits”, were “things that are sweet”, “things that are prepared the same way”, “local Marshallese foods”, and “things I don’t know”.

It appears that the dichotomy in Marshallese foods observed by Pollock in 1986 persists. Marshallese people in Springdale, AR show a very strong tendency to group Meat-based foods, the *jālele*, separately from Vegetarian (Plant-based/starchy/sugary) foods, the *mōñā*. Six groups are sufficient to further partition the items. While there was no major distinction between Marshallese items and Other items, the more recent introductions to the Marshallese diet – hundreds of years as opposed to thousands of years - pork and rice, confounded the pile-sorting task.

Semantic Category Clustering in Free-Lists

There was a movement in the field of cognitive anthropology during the 1970s and 1980s to understand information recall in cultural domain analysis. Cognitive anthropologists noticed that respondents tended to name more items with which they were more familiar. Researchers also noticed that people often named the same types of items sequentially when free-listing. “Chunking”, the psychologist’s term for grouping, or clustering, items together is a popular mnemonic device. People may even group items together without consciously identifying the grouping.

Clustering in free-lists is “a reliable indicator of the cognitive reality of a semantic domain” (Balée and Nolan, 2015:7-8). Therefore, it may be used to support hypotheses based on pile-sorting analyses about different groups.

Robbins and Nolan (2000) asked college students at the University of Missouri to list the names of their relatives (a free-listing task). Then, the researchers had the students answer

several questions about each relative in order to understand how the people were related and how close in attachment they were. The study supported the hypothesis that Americans are closer to their mother's side of the family. Eighty-two percent of the students listed more of their matrilineal relatives. Furthermore, they did tend to list their relatives in groups of matrilineal and patrilineal relatives.

I classified the free-listed items into the same groups, or subsets, 1) Meat-based and 2) Plant-based Foods, created using the pile-sorting task described above. Two items in the written set of free-lists, "*Jāānwūj*/Sandwich" and "*Kuwat*/Canned Food", were coded as "Meat" because it is my understanding that these items typically contain meat, although of course there are times when they can be vegetarian. Using the formula given by Robbins and Nolan (2000), I calculated the amount of semantic category clustering (\underline{C}) in both my verbally collected set of free-lists and my written set of free-lists. I excluded lists where the number of items in either subset was 0 or 1. That left me with a sample size of 20 verbal lists and 56 written free-lists. For each set, I averaged the number of meat terms and plant terms that each respondent gave. I also calculated the degree of clustering of the two groups in each list and for each list as a whole for both of my data sets.

Example: Dressy vs Casual Shoes

The following is an example of how to use the \underline{C} measure developed by Robbins and Nolan (2000). Table 7.2 shows a written free-list generated by the prompt "Please list all the types of shoes you can think of." For the sake of example, I have grouped the listed items into 2 categories, "Dressy" shoes and "Casual" shoes (for this example, please visualize shoes that fit the descriptions I assigned). A quick visual inspection of this list reveals that there is some degree of clustering, $C > 0$, but not maximal clustering, $C < 1$, because the 6 Dressy and 7 Casual items are interspersed unevenly. To calculate the degree of clustering of the Dressy items in this list, take the number of items in the Dressy subset (n_{Dressy}) and subtract the number of runs

of Dressy shoes (r_{Dressy}) appearing in the list. Then divide that number by ($n_{\text{Dressy}} - 1$). Plugging in the numbers gives $C_{\text{Dressy}} = (6-4)/(6-1) = 2/5 = 0.40$. A C_{subset} score less than 0.50 indicates there is no significant clustering (perhaps my Dressy and Casual categories are invalid and the respondent who created this list had more casual boots in mind). To calculate the overall clustering of this list (\underline{C}), take the total number of items listed (N) and subtract the total number of data “chunks” (K). Then divide that number by N minus the total number of subsets (2 in this case for Dressy + Casual). Plugging in the numbers gives $\underline{C} = (13-6)/(13-2) = 7/11 = 0.64$. The \underline{C} value greater than 0.50 indicates that there is likely some semantic category clustering occurring in this list overall along the lines of the 2 categories I determined.

Table 7.2. Free-list of “Shoes” collected from a female respondent, 29 years old

Listed Items	Dressy or Casual
1. Pumps	Dressy
2. Fashion Sneakers	Casual
3. Boots	Dressy
4. Booties	Casual
5. Flip Flops	Casual
6. Sandals (Flat)	Casual
7. Sandals (Heeled)	Dressy
8. Wedges	Dressy
9. Hiking Boots	Casual
10. Running Shoes	Casual
11. Clogs	Casual
12. Peep Toes	Dressy
13. T-Straps	Dressy

Results

For the verbally collected set of 20 free-lists, the average list length was 12.3 items. The average number of meat-based items listed was 4.8 and the average number of plant-

based/starchy/sugary (vegetarian) items listed was 7.5. The average C_{Meat} was 0.76 and the average C_{Veg} was 0.81. The average overall clustering (\underline{C}) was 0.81.

For the larger set of 56 written free-lists, the average list length was 11 items. The average number of meat items listed by respondents was 3.32 and the average number of vegetarian items listed was 7.68. The average C_{Meat} was 0.45 and the average C_{Veg} was 0.71. \underline{C} was 0.66.

Discussion

More vegetarian foods than meat-based foods were listed in both of my sets of free-lists. The predominance of vegetarian foods indicates that compared to meat foods, plant-based foods (and starches, and sugars) are more culturally significant. Less clustering of the meat terms indicates that as a category, it's not as robust as the plant-based foods. Recall the results of the pile-sorting task presented in Part I of this chapter. The NMMDS plot displayed pork slightly separated from the seafoods. I would like to investigate the degree of clustering in these same kinds of free-lists if the "Meat" group was split into two separate groups: 1) Seafood and 2) Land animals. Unfortunately, that analysis would take a larger sample size than I have. Most of the lists I collected were skewed toward vegetarian foods – more than half of the written lists I collected had just one, or none, meat items listed. I would need more lists that contained both land animals and sea creatures to determine if "Land Animals" and "Sea Creatures" are valid groupings.

On the other hand, I did collect enough data to try different ways of splitting the vegetarian group, using Figure 7.4 as a guide. The problem though is the same one evident in my "Shoes" example. I did not know which type of shoe the respondent was picturing: Thigh high patent leather stiletto-heeled boot ("Dressy") or Cognac-colored buckled riding boot ("Casual")? Was she thinking of suede or raffia-coated wedges? Bejeweled flat sandals?

Peep-toe booties? The variation in shoes seems infinite. Similarly, there is variation in recipes for Marshallese dishes. Of course *būbūs*, or grandmas, of every cultural group tend to have their own superior recipes for the classic dishes (matzoh balls, anyone?). Add to that the continuous changes in available foodstuffs that Marshallese people in Springdale have experienced and the number of variations of even the classic dishes climbs even higher. I don't know the ingredients my respondents were thinking about for each dish: Pandanus or pumpkin peru? Rice or banana *bobos* – and should they be rolled in coconut flakes or not? Sometimes *lukor* contains lime juice/zest. Sometimes *aikiu* and *jokkwōp* contain rice. I would need more information to correctly classify the vegetarian foods into different subsets.

Conclusion

C values indicate that my respondents did tend to cluster items in both verbal and written free-lists, especially in regard to plants. The patterns are different for verbal and written free-lists, indicating clustering may work differently for different types of cognitive recall tasks.

SURVEYS

“Kammoolol Anij bwe ejjelok jikin emman / lok jen Springdale in.” (Give thanks to God for there is no other place much better than Springdale.)

Chorus of *Mour ilo Springdale* (Life in Springdale) by musician Michael Bellu

Introduction

Surveys, often also referred to as questionnaires, can be a useful tool in mixed methods data collection because they are usually easy to administer and may collect a lot of pertinent information. However, De Munck (2009) cautions that surveys should be supplementary to field research and not the primary form of data collection. Some of the twenty-one different “pitfalls” to using surveys mentioned by De Munck (2009:122-123) include problems in designing the questions, problems in collecting the surveys, and problems in interpreting the results. Latter problems include discrepancies between how people answer the survey questions and what they actually think or do, which Bernard (2011) refers to as “informant reliability”. In addition, the ways a person truly thinks or acts are mercurial (for some people more than others) so that the way a person answers the survey questions could vary from one day to the next.

One of the most interesting uses of surveys is that it is possible to carry out Cultural Consensus Analysis (CCA) on survey data. CCA is the statistical methodological application of the Cultural Consensus Theory (CCT), which is a model for the way that cultural knowledge is shared (or not) by members of a given group(s). Programs such as ANTHROPAC and UCINET may be used for CCA of survey data. CCA can generate emic, empirical understanding of a cultural domain using a relatively small sample of respondents – even if the researcher doesn’t know much to begin with about the domain in question. CCA can also determine whether cultural schema (also known as cultural models, frames, or scripts) are shared between people

in the same or different groups. Sometimes the patterns revealed by CCA are not obvious in other types of ethnographic data such as surveys or interviews.

Miller et al. (2004) suggest that ethnoscience research such as CCA fell out of fashion in Anthropology during the Vietnam War era, to be replaced by a greater interest in relativistic, qualitative research. However, they are hopeful that interest in quantifying things is slowly picking back up. Indeed, in the twenty-first century there have been several studies using CCA in the fields of medical (Stansbury et al., 2003; Dressler and Bindon, 2000; Fielding-Miller et al., 2016) and psychiatric (Snodgrass et al., 2017) anthropology, environmental anthropology (Miller et al., 2004; Serenari et al., 2015; Carothers et al. 2014), and the anthropology of leisure and tourism (Paris et al., 2015). Many of these studies have focused on applied anthropology, using CCA to generate metric tools (Snodgrass et al., 2017). Several have focused on understanding conflicts, particularly those between natural resource managers and local resource users (Miller et al., 2004; Serenari et al., 2015).

“When combined with the rich and detailed accounts collected through interviews and participant observation, cultural consensus analysis can be a useful technique for assessing agreement and divergence about particular observations of climate change and other drivers of change among a group of resource users (Carothers et al. 2014:np).” In this project, I used CCA to explore the domain of traditional Marshallese foods. Following convention, if the ratio of the first to the second eigenvalues (generated by ANTHROPAC) is greater than or equal to 3.0, then there is a single, dominant structure for the domain of traditional Marshallese foods that is shared by the community in Springdale.

An interesting extension of the CCA is the concept of “cultural consonance”, described by Dressler and Bindon (2000) as how closely someone fits the “modal pattern” or cultural model (or prototype). Low levels of cultural consonance are possibly indicative of social isolation, can lead to health impairments such as high blood pressure and depression. Thus,

CCA has important public health implications, depending on the nature of the behavioral research involved.

Surveys were pre-tested with a group of four Marshallese people and one additional non-Marshallese researcher in Springdale. The final survey instrument consisted of 18 mixed-format questions on the front and back of one sheet of paper. Surveys were collected at the Marshallese Consulate on Spring Street in downtown Springdale, at the office of the Arkansas Coalition of Marshallese (ACOM, which has since moved), and at three different Marshallese churches. Participants were given the choice of taking the survey in English or Marshallese (I had a stack of each). I also had Marshallese friends with me every time I went to collect surveys to serve as translators and facilitators. I eventually procured a total of 116 surveys, but not all of the fields were filled out on all of the forms. After returning the survey, each participant was thanked and given a T-shirt printed especially for this project. Responses to the closed-structure survey questions were coded for CCA, which was performed using ANTHROPAC following the instructions of De Munck (2009).

Results

The first 3 survey questions elicit demographic information for each respondent: Gender, Age, and Home Atoll(s), respectively. Fifty-nine of the respondents were male, 56 were female, and one left their gender unreported. The respondents ranged in age from 11 to 75 years old (2 people did not record their ages) with an average age of 35.41 years old and a median of 36.5 years old. Forty-eight people were from the Urban Centers (UCs) and 61 people were from the Outer Islands (OIs) (7 people did not report their home atoll(s)). While the majority of people from the UCs were from Mājro Atoll (75% of “urbanites”), the capitol of the RMI, the OIs represented were 17 different atolls and islands. The OIs that were claimed by the most people were *Jālooj* Atoll (the former capitol was home to 30% of the country folks), *Mejit*

Atoll (26%), *Wotje* Atoll (18%), and *Arŋo* Atoll (16%). Question 4 on the survey was the prompt for the written free-lists, discussed in the previous chapter.

Respondent #113, a 15 year old female from *Mejit* Atoll, wrote me a brief note to clarify her answer to question number 7. However, four additional people went all out and covered the margins of their papers with little notes on the topic of Marshallese foodways and culture in Springdale. They were respondents #54, a 28 year old male from *Namdik* Atoll, #56, a 40 year old female with ties to four different Outer Islands, #110, a 75 year old male from *Mejit* and *Likiep* Atolls, and #112, a 17 year old male also from *Mejit* and *Likiep* Atolls.

Question 5 asked, “How often do you eat traditional Marshallese foods here in Springdale?” The answer choices were “Frequently” or “Infrequently”. Given that exactly 100 respondents provided answers to this survey portion, only 26 people (26%) indicated that they frequently ate Marshallese foods. Whereas, 74 people (74%) circled infrequently. Sixteen people left the question blank. The four respondents who scribbled ancillary notes on their surveys all commented on this question. Respondent #56, the 40 year old female from *Jālooj*, *Mejit*, *Likiep*, and *Wotje* Atolls, explained that she has traditional Marshallese foods infrequently in Springdale because she doesn’t know how to make them. The other three note-writers indicated that the reason they consume traditional Marshallese foods infrequently in Springdale is because of the absence of those foods here.

There was no significant difference between males and females, or between those below and above the median age of the survey-takers (36.5 years) as to whether they consumed traditional Marshallese foods frequently or infrequently in Springdale. However, a z-test ($z=-2.0646$) revealed a statistically significant difference ($p = 0.0394$; $p<0.05$) between the frequency circled by people from Outer Islands versus the frequency circled by people from Urban Centers. The proportion of “Frequently/Infrequently” responses for people from the Outer Islands (0.185) was half that of the proportion of “Frequently/Infrequently” responses for people from the Urban Centers (0.372). That means that people who came to Springdale from Outer

Islands are more likely to feel that they eat Marshallese foods infrequently here. These results make sense, because more typical Marshallese foods are freely available on Outer Islands than in Urban Centers, so their absence in Springdale may feel more pronounced.

The sixth survey question asked, “Are there enough traditional Marshallese foods available in Springdale?” Again, the answer to this question was in binary format, either “Yes” or “No”. Twelve people left this question blank. Sixty-six people (63%) circled “Yes” and only 38 people (37%) circled “No”. Respondent # 56, who answered “No”, explained, “Only if Mom or family members visit here, that's when I get real Marshallese food. They bring them from the Island.” Respondent #110 wrote that, “Maybe only pumpkin and banana [are available in Springdale in sufficient quantities].”

Question 7 asked, “Is traditional Marshallese food what you miss most about the Islands?” The answer choices were once again “Yes” and “No”. One hundred and one people (96%) answered “Yes”. Three people (about 3%) answered “No”. One person (almost 1%) wrote in “IDK” (short for “I Don’t Know”). And 11 people left the question blank. Respondent #110 wrote, “I miss back home”, which feels sad. Respondent #113 wrote, “Like, *peru*, if you make them.” I think what she was getting at wasn’t a craving for traditional Marshallese foods, but a feeling of longing that she gets when she eats them (especially when she eats the dish, *peru*). Eating *peru* causes her to miss the RMI.

The next question on the survey, number 8, asked, “Here in Springdale, when do you feel most like a Marshallese person?” There were three separate answer choices, “When attending a keemem”, “When eating traditional Marshallese foods”, and “When speaking the Marshallese language”. Respondents were also given a fourth option, “All of the above” (meaning keemem, food, AND language), and a fifth option, “Other” (this choice included a blank space to fill in). Since this question was partially open-ended and came with several options, there were a variety of answers. However, the choice “All of the above” by itself was the most circled answer, by 86 people (74%). Thirteen people (12%) circled “When attending a

keemem” by itself, making that the next most popular answer. Four people (about 4%) circled “When speaking the Marshallese language” by itself and 3 people (about 3%) circled “When eating traditional Marshallese foods” by itself. Only one person used the “Other” option by itself. That person used the blank to describe holidays. Two people used the “Other” answer choice in addition to circling “All of the above”. The first person listed both holidays and Marshallese music as their “Other”. The second person’s “Other” was Marshallese music. One person circled both the food and the language options but not the keemem or “Other” options. Five people left the question blank. But there was one person who circled nothing but indicated simply that he just “knows” [that he is Marshallese].

Question number 9 was, “Is it important for Marshallese people to eat traditional Marshallese foods?” The answer choices were “Yes” and “No”. One hundred and one people (94%) answered “Yes” and 6 people (about 6%) answered “No”. Nine people left the question blank. Respondent #54 added, “Because they grow up with their *Majol* [Marshallese] food.” Respondent #56 brought up the issue of radiation in some Island foods writing, “Because I think all food from that Island have radiation and they make them sick.” Respondent #110 explained that Marshallese people are used to eating Marshallese foods and respondent #112 wrote in specifically that she believes traditional Marshallese foods are healthy (and therefore it is important for Marshallese people to eat them).

The greatest variation in responses to the structured questions was for Question 10, “What is the most important food for Marshallese people?” The options were “Breadfruit” (33% of respondents), “Rice” (49% of respondents), and “Other” (2.5% wrote in “fish”). While 5 people left the question unanswered, 4 people (3.4%) circled both “Breadfruit” and “Rice”, and 1 person circled both and then added “Fish”. One person indicated their vote for both “Breadfruit” (but not “Rice”) and then wrote in “Fish”. Two people wrote that “All Marshallese Foods” were important, and 1 person made a short list of Marshallese foods that included “Breadfruit, Fish, Taro, Pandanus, and Coconut”. One person cast their vote for the pandanus preparation known

as “Peru”. Finally, 2 people circled “Rice” and then added another food item: “Chicken” or “Flour”.

The third of the survey respondents who voted for “Breadfruit” alone as the most important Marshallese food do not statistically differ from the half of the respondents who voted for “Rice” alone.

Question 11 asked, “Do you believe that traditional Marshallese foods are healthy?” The answer choices were “Yes” and “No”. Ninety-five people (90%) circled “Yes”. Nine people (8%) circled “No”. One person circled both “Yes” AND “No”, and 1 person circled neither but wrote in “Some”. Ten people left the question blank. Respondent #54, who answered “No”, brought up the issue of contamination in the foods.

The next question was, “Are you worried that unhealthy foods will give you diabetes or other ills?” Again the answer choices were “Yes” and “No”. Ninety-six people (89%) circled “Yes” and 12 people (11%) circled “No”. Eight people left this question blank.

“Are you worried about chemicals in your American foods?” was question 13. “Yes” and “No” were the two answer choices. One hundred and two people (92%) circled “Yes” and 8 people (7%) circled “No”. One person circled neither but wrote in “Not Sure”, and 5 people left the question unanswered.

Question 14 asked, “Do you crave traditional Marshallese foods when you feel sick?” The options to answer were “Yes” and “No”. Ninety-one people (85%) circled “Yes” and fifteen people (14%) circled “No”. One person circled neither option but wrote in “Sometimes”. Nine people left the question blank. “Rice,” wrote respondent #110, and “food that’s made out of flour...” I also crave simple carbohydrates when I’m feeling sick, but I don’t consider those traditional Marshallese foods per se.

The last structured question on the survey was, “Do you want your children to eat traditional Marshallese foods?” The answer choices were “Yes”, “No”, and “Don’t Care”. Ninety-five people (88%) circled “Yes” and only 1 person (about 1%) circled “No”. Twelve people

(11%) circled “Don’t Care”. Eight people skipped the question. Respondents #56 and #112 explained (that they want their children to eat traditional Marshallese foods), “So they can know where they [came] from.” Respondent #110 echoed the beliefs of numbers #56 and #112 adding that food is not just about the identity of one’s past, it is also the identity that one has in the present. “So they can know who they are.” He wrote.

Question 16 asked, “What are some new foods people eat now in the RMI?” and it had three blank spaces for people to write in their answer(s). Eighty-five people answered this question by filling in an average of 2.8/3.0 blanks. Sixty-four different items were mentioned. The most frequently listed item was rice (39%), which was also the most salient (by Smith’s S). This question must have been misread by a few people who didn’t see the word “new”. I should have used a different font for greater emphasis. Because some of the items listed have certainly been eaten in the Marshall Islands for a thousand years or more, such as “breadfruit”, “*bwiro*”, and “Marshallese Food”. Excluding items that fall into this “mistake” category, the other items that were mentioned can be grouped into the main categories of “foreign cuisines” (e.g. “Chinese Food”), “foreign ingredients” (e.g. “Apples”), and “commodity foods” (e.g. “White Bread”).

The penultimate survey question was, “What are some new foods that Marshallese people eat now in Springdale?”. This question was also followed by three blank spaces. Ninety people answered this question by filling in an average of 2.6 of the three blanks. Seventy-eight different items were listed, with chicken being listed most frequently (30%) closely followed by rice (27%). Chicken and rice were also the first and second most salient (Smith’s S) items, respectively. Many of the same items were listed as for the previous question, however, an additional main category of “Restaurants” emerges (e.g. “Dunkin Donuts”, “Taco Bell”, “Burger King”). Eight different restaurants are mentioned.

The final survey question was, “What are some ingredients you use here to substitute for traditional ingredients?” Again, this question had three blanks below it. Ninety-two people

answered this question, listing a total of 88 different items. The 92 respondents each listed an average of 2.5 items. Soy sauce was listed most frequently (18.5%) and also had the highest salience (Smith's S). The two main categories of items listed in response to this question were "Condiments" (e.g. "Soy sauce", "Spices", "Ketchup") and "Vegetables" (e.g. "Broccoli", "Onions").

Cultural Consensus Model

The ratio of eigenvalues computed by ANTHROPAC was 6.5 (which is greater than 3.0), indicating that there is indeed agreement within the group as a whole about traditional Marshallese foods. The average competency of the respondents was 0.812 with a standard deviation of 0.152. According to Brewis et al. (2011), a competency above 0.8 is considered very high. These results mean that over 80% of the time, the average person knows the same things that the others know. According to ANTHROPAC, the culturally correct answers to the closed-structure survey questions are:

- Question 5: "How often do you eat traditional Marshallese foods here in Springdale?"

Answer: "Infrequently"

- Question 8: "Here in Springdale, when do you feel most like a Marshallese person?"

Answer: "All of the Above" (That is, "When attending a *keemem*", "When eating traditional Marshallese foods", and "When speaking the Marshallese language")

- Question 10: "What is the most important food for Marshallese people?"

Answer: "Rice"

The culturally correct answer to ALL of the "Yes" or "No" questions is "Yes". This exemplifies an intense positive bias and calls the reliability of the respondents in to question. Researchers working with Marshallese people should probably avoid asking simple "Yes"/"No" questions.

Discussion

I believe the tremendous positive bias in the survey results reflects those Marshallese values that are stereotypical of island peoples: Agreeability, friendliness, cheerfulness, eagerness to please.... At first I thought it was an uninterested time-saving technique of always circling the first answer, especially because the questions had different levels of positive and negative connotations. However, people didn't always circle "Yes", so it seems like even though there is clearly a preference to circle "Yes", respondents were taking at least a brief moment to think about the questions. Bernard (2011) refers to this tendency of some people to say what they think they should say, or what they think the researcher wants to hear, as "informant reliability". The same question may have 2 answers: an apparent and an actual response. Furthermore, lots of blanks indicate that maybe people felt uncomfortable answering some of the questions. Perhaps Marshallese people in Springdale would rather leave a question blank than answer "No" too many times. Hezel (2013) in his recent book about Micronesian culture, explicitly writes about the tendency of Micronesian people to apparently agree to things that they have no intention of doing, or of showing up to. To them, "Yes" isn't a commitment, it's an attitude.

As for the frequency and availability of traditional Marshallese foods in Springdale, the majority of people surveyed indicated that they consumed traditional Marshallese foods infrequently, even though based on these same peoples' free-lists, white rice and chicken are considered traditional Marshallese foods. If there is a discrepancy here, I believe it is one of context. If the rice, or other item, is eaten in the RMI, or at an event at a Marshallese church in Springdale, it could be considered "Marshallese food". However, without the necessary environmental cues, an item could be considered non-Marshallese.

Upon reflection, question 7 seems like a leading question. It was derived from the interview data, but my interviews were all about food! There is a clear positive bias – doesn't

anyone miss their *būbū* more than *bwiro*? Note the note about *peru*. This dish, a pudding-like concoction traditionally prepared with pandanus but now also with pumpkin, also pops up in the blank field in question number ten for two respondents, indicating that it has considerable cultural significance.

Keemems, food, and language are clearly all part of Marshallese identity in Springdale. However, Holidays such as Christmas and Gospel Day, and Marshallese music are also important parts of Marshallese cultural identity in Springdale that I hadn't thought to include on the survey as an etic observer.

Almost fifty percent of the people surveyed considered rice alone to be the most important Marshallese food, at least at the time (De Munck (2009) writes that survey answers are fluid, not facts). Although these results are in line with Marshallese concepts of food and are supported by anecdotal evidence, they seem slightly at odds with the results from the free-lists I collected. The free-list data show that rice is indeed considered one of the core traditional Marshallese foods, however, breadfruit has a much higher cognitive salience. Yet only 33 % of survey respondents considered breadfruit alone to be the most important Marshallese food. And there were no other differences in their responses that correlated with that choice. At first I thought this might be a cultural consonance issue, with either breadfruit or rice being the apparent culturally correct answer. However, after talking over the situation with other researchers, including a cognitive scientist, I believe that it is just a common difference in opinion as to the phrasing of the question, particularly the word "important" (and perhaps also the word "traditional"). "Important" can mean different things to different people. The most likely truth in this case is that breadfruit and rice are equally important items in the domain of traditional Marshallese food. It would be possible to follow up on this matter by taking a small subset of the Springdale Marshallese community and asking them to define the word "important", however, for the purposes of this project that seems unnecessary.

The results of the last three questions demonstrate how the domain of traditional Marshallese foods is gradually diffusing here in Springdale. The prevalence of restaurants listed in response to Question 17 reveals that Marshallese people in Springdale are a new market of consumers that restaurants, especially local chains, may want to cater to.

Cultural Consensus

The results of the CCA are unsurprising given how almost unanimously agreeable respondents were and how limited the core domain of traditional Marshallese foods seems to be. For more interesting results, this study could be the basis for a cross-cultural comparison of foodways in Springdale or in the RMI.

Conclusion

A delocalization (Pelto and Pelto, 1983) effect was found in the response of Marshallese people in Springdale to the question (Question 5 on the survey) of how frequently they consume traditional Marshallese foods. More people from the Urban Centers (UCs) of the RMI, *Mājro* and *Ebeye*, are likely to say that they consume Marshallese foods frequently in Springdale, than people from the Outer Islands (OIs). The food in the UCs may be more similar to the food available in Springdale. For example, there would be rice, sodas, and canned foods available for purchase at small stores. Whereas in the OIs, the foodways back in the RMI and in Springdale are likely to contrast more starkly. In the OIs, the food would be more fresh and consisting of items such as breadfruit and reef fish that are largely absent in Springdale.

I still wish that I had asked about the length of time that the respondents had lived in Springdale. I also found out that when conducting surveys in Springdale, it is more productive to offer selections beyond just “Yes” and “No”. Perhaps instead of a survey, a triads test, paired comparisons, sentence frames, or other similar CCA tool could have been used. However, that

may have been more difficult and time-consuming to administer, especially for respondents who don't speak English well or at all, and who are not familiar with such cognitive tasks.

BREADFRUIT SYMBOLISM

“Focusing on the production, distribution and consumption of this most important food enables simultaneous examination of material changes in people’s lives and their symbolic and social repercussions.”

Anthropologist Carole M. Counihan (1984:56)

Introduction

Mā, breadfruit (*Artocarpus altilus*), is a cultural object that serves as a symbol of and for the Marshallese community in Springdale, AR. The term cultural object refers to something tangible. “The puzzle at hand entails both how these objects move in and out of being considered tasteful and the ways in which tastes for certain aesthetic objects indicate (and indeed maintain) profound distinctions between groups (Jordan, 2007:23).” Cultural objects can assume symbolic importance as markers of status and identity.

Breadfruit is important throughout Micronesia as a medicinal plant, wood source, and, most vitally, as a staple starchy food. Over the past few centuries, breadfruit has served as a symbol of Micronesian values to both Micronesians and Westerners-albeit representing different values depending on the group. To Marshallese people in Springdale, breadfruit symbolizes national pride and *mānit Majol*, or tradition. To non-Marshallese people, breadfruit symbolizes that which is strange and therefore inferior. In the earlier chapter on free-listing, breadfruit was found to be by far the most salient item in the domain of traditional Marshallese foods. This indicates that its symbolic importance persists today, even in communities where its availability is sporadic.

There is not only one identity that is shared by all Marshallese people in Springdale. For example, I know some people who consider themselves Marshallese and also Chamorro, or Marshallese and Chinese, or Marshallese and American. I know some Marshallese Millennials

and some Marshallese mothers, Marshallese athletes and bookworms. Everyone might identify themselves differently, however in this chapter I will explore the characteristics of Marshallese cultural identity that are shared by the greatest number of people.

Counihan implies that ALL foods are symbolic. However, her 1984 paper on cultural change in rural Italy focuses on bread because, “As traditionally the most important food in the Sardinian diet, bread is a particularly sensitive indicator of change (p.49).” The same might be said of breadfruit’s place in Marshallese cuisine and culture.

Although food preparation is generally considered to be one of the most important aspects of Marshallese culture, it is not as well-respected as canoe-building (Miller, 2010:57). Canoes are no longer commonly used for transportation or food procurement. However, they are preserved in songs and proverbs (Miller, 2010:81). Furthermore, the decline of the canoe as an everyday object seems to keep pace with its rise in significance as a cultural symbol. Miller (2010) refers to this inverse correlation as the “paradox of loss”. Thus, there is a temporal aspect of Marshallese symbolism. Traditional symbols of the culture such as canoes and breadfruit (which both come from the same tree) are complicated because of their association with the past, which some people consider to have been a “backward” way of life (Miller, 2010:58).

Symbolic Food Items

Douglas (1970) explains that a natural symbol is an object from the natural world to which humans attach a special meaning. In his work expanding on this idea, Fiddes (1991) explains how meat is one such natural symbol in Western culture. Meat represents masculinity. It represents man's dominance over nature. It even represents food in general. Australian men are strongly stereotyped as hyper masculine. However, Le (2016) suggests that the general

lack of interest they display in dining on kangaroo meat could come from the status of the kangaroo as a national natural symbol. There's a kangaroo in the country's coat of arms.

In many Pacific cultures, meat does not carry the same symbolic meaning described by Fiddes. Before European contact in the fifteenth century, the small, remote atolls of Micronesia did not have cows, pigs, chickens, or other land animal foods (they may have had rats and dogs which they ate). They had seafood (fish was preferred to shellfish). However, the majority of their diet was made up of starchy plant foods. Although some types of taro have higher status than breadfruit on Micronesia's more temperate atolls, breadfruit is overall the most important staple food in the region, and the main food eaten in the Marshall Islands.

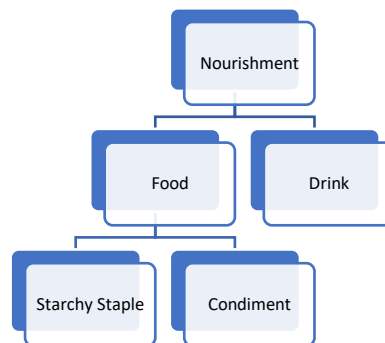


Figure 9.1. Taken from Kahn and Sexton (1988), this hierarchy shows how Pacific peoples view the Nourishment domain. In the Republic of the Marshall Islands (RMI), "Drink" usually refers to coconuts and coconut products. The "Starchy Staple" refers to plant-based foods such as breadfruit, taro, and rice, and the "Condiment" category contains meats.

For Marshallese people, breadfruit stands as a symbol of identity both as a food and material for canoes, as a symbol of femininity, a symbol of the natural world, and a political symbol.

The Western Opinion of Breadfruit

The status of breadfruit in Europe and the US has completed the cycle from novelty to unknown entity and back to novelty. Through Western eyes, breadfruit was most commonly described as a bread substitute. Bread that grew on trees symbolized Micronesian idleness.

Micronesians were seen as lazy and childlike (Smith, 2006), a view that the Pohnpeians have, at least partly, internalized (Petersen, 2006). There was also a connection to the non-hunting, non-meat, feminine aspect, which had been devalued in Western culture. All of these views contributed to the legitimization of European colonialism in Micronesia.

During the Romantic Period of the late eighteenth century, European botanists obsessed over Tahitian breadfruit. They were led by the womanizing Sir Joseph Banks, who sailed the South Seas with Captain Cook. Breadfruit became a symbol of plenty (food and love). However, as the Pacific islands became less than Eden-like by succumbing to the same problems as their European colonizers, the glowing reputation of breadfruit began to dim. Finally, when it was taken to the West Indies to be used as slave food, breadfruit began to develop negative associations in Europe (Fulford, 2004).

Today breadfruit serves as a symbol for the Micronesian region itself in the eyes of the Western world. Petersen (2006) theorizes that there was a "breadfruit revolution" several hundreds of years ago in Micronesia that served to unite the region. Wenkam and Baker (1971) use the exact same term to refer to the end of colonialism in Micronesia in the latter part of the twentieth century.

There is a renewed interest in breadfruit in the West due to the search for lower glycemic index, GI, and gluten-free alternatives to bread and wheat flour. The Omnivore's Dilemma also contributes to the growing popularity of breadfruit by keeping foodies searching for new healthy and delicious foods. And increased delocalization and globalization pave the way for the acceptance of breadfruit as a food item in non-Marshallese cultures. The quality of breadfruit available in Springdale however, does nothing to recommend it.

The Marshallese Opinion of Breadfruit

Core Food, Core Identity

Flinn (1988) wrote that even just by itself, breadfruit constitutes an acceptable meal. It is considered the most important subsistence food crop in Pohnpei, Chuuk, Kosrae, the RMI (Lorens and Englberger, 2007), and Kiribati (Redfern, 2007). Counihan (1984:50) declared that in Sardinia bread was “symbolic of life” because it was the staple food of her study community, Bosa, for hundreds of years. To support her argument, she lists five different sayings equating bread with good fortune, security, and immortality. The standard Marshallese-English dictionary by Abo et al. (1976) has different terms relating to breadfruit, specifically "eighteen words for different varieties of breadfruit, eight terms relating to ripeness that were used only for breadfruit, and forty-seven other terms that had to do with breadfruit, including: *mabun*: breadfruit blown down by the wind (Rudiak-Gould, 2009:44)." Such lexical elaboration indicates the utilitarian importance of the species (Hunn and Brown, 2011).

"The cultures of the Pacific Islands use food as a major vehicle for the teaching of traditions, an indicator of kinship and other social relationships, and a currency for the exchange of wealth (Kahn and Sexton, 1988:1)." Food is an important sign of sociability in Micronesia. Anyone seen walking by a homestead is offered food (Flinn, 1988). After all, being generous with food is a key Micronesian value. Friends who have spent time in the RMI report that oftentimes children will take advantage of the neighborhood's generosity and migrate toward whatever house may be serving *namonamo* (pancakes) on a given morning.

Visitors to a homestead are not merely offered food, they are plied with way too much food (it's considered polite to complain that it is too much food). They are supposed to take leftovers (Flinn, 1988). I've been fortunate enough to be in this position many times in Springdale. For Micronesians, taking leftovers is to take memories of the place that the food

came from. Later, when one consumes the leftovers, she may remember the party and the company she enjoyed there.

In Micronesian culture, breadfruit is more than the equivalent of meat to Westerners. In some respects it is similar because it also functions as the main food concept. However, in some ways breadfruit is the opposite of meat because it symbolizes femininity rather than masculinity and unity with nature instead of dominance over the natural world. Furthermore, breadfruit still takes on the religious and political significance that meat has held since Biblical times in the Western world with animal sacrifices and pork or beef taboos to help determine group identity (Simoons, 1994).

In Springdale breadfruit needs to either be hunted down at one of the small Asian grocery stores or specially brought by a caring relative visiting from the Islands. Because of its irregularity and difficulty to obtain, breadfruit-eating is a marker of distinction. Status symbols are related to accessibility, monopolization, and elitism (Jordan, 2007). However, the popularity of breadfruit in the Springdale Marshallese community may have deeper implications than that of mere status symbol. It may function as a balm for topophilic nostalgia and homesickness. And then, breadfruit is made doubly salient because it is not just a food but also the material for building canoes. The *wa*, traditional outrigger canoe, is symbolic of Marshallese culture and identity (Miller, 2010). The Shiloh Museum in Springdale is currently hosting a Marshallese traditional canoe building project. In just a couple of months, the canoe will traverse the local reservoir, Beaver Lake.

Breadfruit Mythology

Micronesian stories are orally passed between generations. Breadfruit trees and fruits figure into many Micronesian stories. One common theme is transformation. A person or magical being may be transformed into a breadfruit tree or even just the fruits. After the transformation, the fruits are consumed by a grateful community (Lorens and Englberger, 2007;

Kelin, 2003; Tobin, 2002). These stories teach generosity, an important Micronesian value. Life on a tiny atoll can be precarious but food and resource sharing helps everyone survive. *Jebro* is the ancient Marshallese breadfruit god (Barker, 2013). *Jebro* is known for being a wise and fair chief. Today, he is represented by the constellation we know as the Pleiades.

Breadfruit and Gender

Men and women traditionally worked together to ready breadfruit for eating. Men picked it and women cooked it. Both sexes participated in making *bwiro*. Furthermore, Carucci (1997) connects breadfruit and other traditional Marshallese plant foods with the feminine. Micronesian societies are matrilineal (Petersen, 2006). Land and rights to the fruit of any trees growing on it are inherited from one's maternal grandmother. In the Marshall Islands however, it is taboo for women to climb the tall trees to pick breadfruit because the action required might reveal their thigh areas. So the procurement (male) and preparation (female) of breadfruit for consumption is a collaborative effort requiring harmony between the sexes. Flinn (1988) also mentions this gender ideology in her work on the Pulapese, people who come from a rural atoll, in Chuuk (formerly called Truk), a state in the Federated States of Micronesia (FSM).

Because of the relationships between land and family, breadfruit from various places connects Micronesians throughout the region. Flinn (1988) even noted that kinship on Chuuk was less about bloodlines than it was about with whom one shared their food. Sharing food to people on distant islands makes even those people one's kin.

Breadfruit and Nature

In many parts of Micronesia, breadfruit marks the shift in seasons. This is linguistically apparent. For example, on Pulap Atoll in Chuuk, FSM, the two seasons are called *leerek* (breadfruit season, occurring April through September of our calendar), and *leefeng* (few breadfruit, October to March) (Flinn, 1988). On Pohnpei, the same months of breadfruit season are called *rahk*, which means "season of plenty" (Lorens and Englberger, 2007). First fruit

rituals traditionally accompany these changes in season. First fruit presentations are traditionally made to the chief in many Micronesian societies. On Pulap, the first breadfruit, marking the beginning of *leerek*, is called *mmweni mááy*, and the first preserved breadfruit, marking *leefeng*, is called *mmweni maar* (Flinn, 1988). The chief doesn't eat all these first fruits himself, rather various clans act to divide the food between everyone on the atoll. On Pohnpei, Lorens and Englberger (2007) recorded six different breadfruit presentation ceremonies, or *nohpwei*. However, the researchers noted that these days, all six ceremonies may not necessarily occur, or they may be performed out of the proper order.

Breadfruit and Reciprocity

“A man does not eat with his enemy (Mauss, 1967:55).” Breadfruit serves in both secular and religious rituals as a sign of solidarity and respect. Feasts are held to mark important life event such as births, weddings, and puberty rites (today replaced by graduation from elementary school) on Pulap Atoll (Flinn, 1988). At these feasts, male relatives provide fish and the females bring cooked starchy staples (e.g. taro, breadfruit). Grandfathers are encouraged to take the largest share of the food, which is a sign of respect and status in Micronesian societies (Keating, 2000). Feasting allows everyone to fill themselves equally (Counihan, 1984). Counihan (1984) discusses how the decline of bread sharing and gifting in rural Italy correlates with the increase in individuality as opposed to community.

As the food of the “wild” is tamed into the food on the shelf of the grocery store, the opportunity for social interaction shrinks. When one purchases food at a store, she interacts only with the person operating the register, and even then only briefly. At Walmart, one does not even have to face a human cashier, as there are self-service checkout lanes. Sometimes less social interaction can be nice, as in the case of nosy neighbors. It's never convenient to be totally dependent on others. However, without community support people still have to be dependent on something. Increasingly that something is hard currency, cash money.

Breadfruit and Politics

Breadfruit functions in identity politics for urban and resettled Micronesians today. "For Pulapese in Micronesia, the symbolic significance of traditional foods promotes the continued production and consumption of taro, breadfruit, and other local foods (Flinn, 1988:19)." The symbolism Flinn refers to includes kinship, as expressed through production, exchange, and sharing, as well as the traditional Pulapese values that are considered important for being a good person. These values are solidarity, respect, and generosity. In Chuuk, eating imported foods is associated with less valued behaviors and a break with tradition.

Breadfruit serves as a symbol for political autonomy because of its association with Micronesian tradition. Petersen (1979-1980) was in Pohnpei in the late 1970s when Independence was on the ballot. He wrote that the vote was seen as a choice between breadfruit (autonomy) or rice (dependence). The end of the colonial period in Micronesia has been dubbed "The Breadfruit Revolution" (Wenkam and Baker, 1971).

Conclusion

The importance of breadfruit in the diet of Marshallese people in Springdale is at odds with global climate change, migration patterns, and corporate marketing. The problem remains that breadfruit production, key to food sovereignty for many Micronesian cultures, is in trouble. Many of the low-lying atolls housing unique varieties are threatened by rising seas. There are sizable Micronesian populations in both tropical Hawaii and California. However, temperate Oregon and Arkansas are also home to thousands of Micronesians, especially from the RMI. Breadfruit can't grow in Arkansas, and the fresh fruits can't be shipped in from Micronesia, as they spoil too rapidly. Breadfruit from the Caribbean is sometimes available in specialty stores in Springdale, AR, but Marshallese consumers explain that it is of inferior quality. That may be due to it being a different variety than they are used to, or to its not being as fresh after shipping.

When breadfruit is unavailable, people may substitute less nutritious starches, especially rice (Kahn and Sexton, 1988; Flinn, 1988). In Gilbertese, *tibutaua* means "eating to feel stuffed" (Lewis, 1988). This feeling is much healthier to achieve through eating traditional starchy plant foods than through eating imported rice and tinned corned beef. Unhealthy eating patterns have led to high incidences of type II diabetes and other chronic diseases in Pacific Islander populations (McElfish et al., 2016). Marshallese people are approximately eight times more likely than the average American to have type II diabetes. Pollock (1992) suggests that Micronesians have gut flora adapted to their traditional starchy staple foods. However, some Marshallese believe that their susceptibility to type II diabetes may be yet another consequence of radiation poisoning due to US nuclear testing in the northern atolls.

CONCLUSION

Ekmouj jab meļokļok kilōneen (The Pacific Longnose Parrotfish does not forget its surge channel).

Marshallese proverb (meaning a person always remembers their home island and tradition) (Stone et al., 2000:45)

More kinds of foods (including fresh local produce, cheaper superstore brands, and items imported from Asia and Latin America) are available in Springdale than in the RMI. However, social and or economic marginalization may prevent Marshallese migrants from fully participating in the local food scene. The result is decreased food security (access to enough healthy and nutritious foods) in the Marshallese community in Springdale. Furthermore, the stark absence of particularly symbolic cultural food objects, such as fresh, Marshallese varieties of breadfruit, threatens the physical and emotional health of migrants by decreasing their food sovereignty (access to enough culturally significant foods). The low levels of food security and food sovereignty in the Marshallese community in Springdale represent a continuation of the power imbalance (in favor of Euro-Americans) of colonial times almost as much as the radioactive legacy that makes the health of Marshallese people especially vulnerable. Stressing the immediacy of the situation, global climate change is causing wild waves and flooding in the RMI today (as in this very morning). Even within the state of Arkansas, not everyone is familiar with the complex issues that surround Springdale's "New Island" like a reef, but awareness is increasing. To this end, the current work serves an educational purpose, filling some gaps in the literature on Marshallese Studies. It has also lent itself to testing a new way of calculating cognitive salience. Advocates who wish to implement programs to improve the health of the Marshallese community in Springdale may use this research to guide their program development. In addition, it was shown that B' is an effective way to calculate cognitive salience for items in the domain of traditional Marshallese foods (and shoes). Finally, this work now

exists to illustrate the current state of traditional Marshallese foodways in Springdale. In the years to come, it may serve as a way to evaluate further environmental and cultural changes, while preserving some knowledge about traditional foods.

The specific goals of this work were to identify the most important items that comprise the domain of traditional Marshallese foods, to explore how Marshallese foodways have changed or stayed the same across time and space, to map how knowledge about traditional Marshallese foodways is distributed throughout the community in Springdale, and to observe ways in which Marshallese people in Springdale use foodways to perform group identity.

The food most valued by the Marshallese community in Springdale is breadfruit. Yet much of that value is symbolic. As a source of satiety, rice is nearly equal to breadfruit. Both breadfruit and rice are highly starchy foods. Biochemically that means that they both contain a lot of densely-packed sugar molecules, and culturally it means that they can both satisfy the requirement for a traditional Marshallese staple dish, or *m̧ōñā*. However the nutritional similarities of breadfruit and rice about end at their carbohydrate composition. Breadfruit contains more vitamins and minerals than white rice, making it a healthier choice. And then there are the ecological differences between the two foods. Breadfruit has been part of the ecosystem in the Marshall Islands for many hundreds of years, while rice plants don't do well there at all. People from the Marshall Islands may be uniquely genetically adapted to thrive on a breadfruit-heavy diet, even though in the Urban Centers (UCs) of the RMI, people most commonly eat rice that is imported from Asia. Conversely, in Springdale rice is *almost* local (one of the most prolific rice growing regions of the world is about a 4-hour drive to the southeastern part of Arkansas State), and breadfruit is impossible to grow.

It would be simplistic and patronizing to describe the historic changes in Marshallese foodways as a declension narrative. Levin (2017) points out that Pacific foods have always been tied to the motion of people and culture. Since they first settled on their distant, bright coral atolls, the Marshallese people have been travelers. They brought some plant foods with

them from whence they came (e.g. coconuts, taro) and others they adopted as the novel foods and ideas moved in after them (e.g. rice, SPAM). Marshallese people are still moving (as migrants to Springdale, Enid, Orange County, and elsewhere) and they are still bringing foods with them (e.g. breadfruit, SPAM) and incorporating new ones (e.g. canned pumpkin).

No significant patterns of traditional foodways knowledge distribution were observed in the study sample in Springdale. The main demographic difference was due to the respondents home atoll in the RMI, as those who had lived on Outer Islands (OIs) were found to be more likely to say they consumed traditional Marshallese foods infrequently in Springdale.

One of the main ways in which Marshallese people in Springdale perform their group identity is through eating their traditional foods together at *keemems*. In preparation for such Saturday-evening events, relatives fly to Springdale from the RMI, bringing large coolers filled with reef fish and tropical fruits. In this way, the Springdale community gets an infusion of food and culture from the home country, and Marshallese cultural identity is reinforced. At *keemems*, Marshallese people can eat Marshallese foods, hear Marshallese music, and relive unique memories of the RMI while simultaneously creating new memories of life in Springdale.

It's been said that anthropologists are good at critiquing, but not good at offering solutions. The diet-related epidemic of type II diabetes in the Marshallese community in Springdale is not a simple problem. Marshallese people could not return to their healthy traditional cuisine of breadfruit, pandanus, taro, fish, and coconut even if they wanted to. Environmental and social changes have made that impossible. However, Marshallese concepts of change and constancy do not require a complete reversal of the nutritional shift that occurred in the last century. Adapting to new environments is a strong characteristic of the Marshallese people.

One future direction that might be taken following this work may be the development of culturally sensitive programming to meet the needs of the Marshallese community in Springdale. Just one such example would be a "Cooking Matters" type class, perhaps held at the Jones

Center for Families on Emma Avenue in Springdale, to teach Marshallese homemakers some healthy recipes that would incorporate items such as brown rice, which has a Glycemic Index (GI) of about 55, rather than white rice, which has a GI of about 64 (Sun et al., 2010). Another future direction would be a more in-depth study, one perhaps involving the collection of oral histories on Marshallese foodways in Springdale. I would recommend recruiting more respondents for a larger sample size, as well as looking at socioeconomic differences in TEK and food consumption patterns. A comparative study (comparing the Marshallese community in Springdale to other Marshallese communities or to non-Marshallese groups) using this work as a reference would also be useful in the investigation of traditional Marshallese foods. Also in the near future there most definitely should be a Marshallese cookbook featuring culturally important recipes. Some Marshallese ingredients and prepared dishes are not found in the standard dictionary from Abo et al. (1976). Therefore a supplemental resource should definitely also be published as soon as possible. Finally, Springdale should have a Marshallese food restaurant, because I'm hungry for more.

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IRB APPROVAL



UNIVERSITY OF
ARKANSAS

Office of Research Compliance
Institutional Review Board

September 23, 2014

MEMORANDUM

TO: Diana Chen
Justin Nolan

FROM: Ro Woodruff
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 14-09-089

Protocol Title: **Foodways in an Immigrant Community in Arkansas**

Review Type: ☐ EXEMPT ☒ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 09/23/2014 Expiration Date: 09/11/2015

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form [Continuing Review for IRB Approved Projects](#), prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<http://vprel.uark.edu/210.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 20 participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval prior to implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

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The University of Arkansas is an equal opportunity/affirmative action institution.



September 18, 2015

MEMORANDUM

TO: Diana Chen
Justin Nolan

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT CONTINUATION

IRB Protocol #: 14-09-089

Protocol Title: *Foodways in an Immigrant Community in Arkansas*

Review Type: ☐ EXEMPT ☒ EXPEDITED ☐ FULL IRB

Previous Approval Period: Start Date: 09/23/2014 Expiration Date: 09/11/2015

New Expiration Date: 09/11/2016

Your request to extend the referenced protocol has been approved by the IRB. If at the end of this period you wish to continue the project, you must submit a request using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. Failure to obtain approval for a continuation on or prior to this new expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

This protocol has been approved for 35 total participants. If you wish to make any modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.



Office of Research Compliance
Institutional Review Board

February 11, 2016

MEMORANDUM

TO: Diana Chen
Justin Nolan

FROM: Ro Windwalker
IRB Coordinator

RE: PROJECT MODIFICATION

IRB Protocol #: 14-09-089

Protocol Title: *Foodways in an Immigrant Community in Arkansas*

Review Type: ☐ EXEMPT ☒ EXPEDITED ☐ FULL IRB

Approved Project Period: Start Date: 02/09/2016 Expiration Date: 09/11/2016

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 235 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 109 MLKG Building.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

SURVEY

Marshalllese Food and Culture in Springdale, Arkansas

Instructions:

- Circle or write your answer on the paper.
- Do not write your name. This survey is anonymous.
- Participation is voluntary. You may skip any question or stop at any time.
- The survey will take ten minutes.
- Thank you for your time!

- | | Male | Female |
|---|------|--------|
| 1) What is your gender? | | |
| 2) What is your age? | | |
| 3) Which atolls/islands are you from? | | |
| 4) What are some traditional Marshallese foods? | | |

- 5) How often do you eat traditional Marshallese foods here in Springdale?

Frequently
Infrequently

- 6) Are there enough traditional Marshallese foods available in Springdale? Yes No
- 7) Is traditional Marshallese food what you miss most about the Islands? Yes No
- 8) Here in Springdale, when do you feel most like a Marshallese perso?

When attending a ~~keemem~~

When eating traditional Marshallese foods

When speaking the Marshallese language

All of the above

Other:

- 9) Is it important for Marshallese people to eat traditional Marshallese foods? [Yes](#) [No](#)

- 10) What is the most important food for Marshallese people?
Breakfast _____ Rice _____ Other: _____
- 11) Do you believe that traditional Marshallese foods are healthy? Yes No
- 12) Are you worried that unhealthy foods will give you diabetes or other ills? Yes No
- 13) Are you worried about chemicals in your American foods? Yes No
- 14) Do you crave traditional Marshallese foods when you feel sick? Yes No
- 15) Do you want your children to eat traditional Marshallese foods?
Yes _____ No _____ Don't care _____
- 16) What are some new foods people eat now in the Republic of the Marshall Islands?

- 17) What are some new foods that Marshallese people eat now in Springdale?

- 18) What are some ingredients you use here to substitute for traditional ingredients?

GLOSSARY

<i>Aelōn Kein Ad</i>	Traditional Marshallese name of the RMI
<i>aikiu</i>	A food, soup of spongy coconut and arrowroot
<i>Aelōñjaplap</i>	A place, Marshallese atoll of the <i>Ralik</i> Chain
<i>Aelok</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain
<i>aļap</i>	Lineage head, traditional Marshallese land manager
<i>ametōma</i>	Coconut candy
<i>añōneañ</i>	Autumn-Winter season
<i>Aṃo</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain
<i>baañke</i>	Pumpkin (<i>Cucurbita pepo</i>)
<i>bao</i>	Bird, general term
<i>baru</i>	Crab, general term
<i>barulep</i>	Coconut crab (<i>Birgus latro</i>)
<i>bōb</i>	Pandanus (<i>Pandanus fischerianus</i>)
<i>Bok-ak</i>	A place, Marshallese atoll north of the <i>Ratak</i> Chain
<i>bōl</i>	Man-made taro muck pit
<i>būbū</i>	Grandmother (child's speech)
<i>bwebwe</i>	Tuna (<i>Neothunus macropterus</i>)
<i>bwebwenato</i>	Story, telling stories
<i>bwidej kōn</i>	Muck soil
<i>bwij</i>	Lineage
<i>bwilitudek</i>	A food, sliced unripe breadfruit cooked in coconut milk
<i>bwiro</i>	A food, fermented breadfruit
<i>Epoon</i>	A place, Marshallese Atoll of the <i>Ralik</i> Chain

<i>Ejit</i>	An islet of <i>Mājro</i> Atoll
<i>ek</i>	Fish, general term
<i>ekkan</i>	Traditional tribute for the chief
<i>Ekmouj jab</i> <i>meļokļok kilōneen</i>	Marshallese proverb about remembering one's home atoll and customs
<i>ellōk</i>	Rabbitfish (<i>Siganus rostratus</i>)
<i>Eneen-Kio</i>	A place, Wake Island
<i>Eneko</i>	Marshallese resort islet
<i>Āne-wātak</i>	A place, Marshallese atoll slightly west of the northern Ralik Chain, nuclear testing site, location of the <i>Runit</i> Dome
<i>nnọ</i>	delicious
<i>ioḱwe</i>	Hello
<i>iaraj</i>	Giant swamp taro (<i>Cyrtosperma chamissonis</i>)
<i>ljaje</i>	I don't know
<i>inoñ</i>	Legend
<i>iroij</i>	Chiefly class of traditional Marshallese society
<i>Iroij Rilik</i>	Ancient Marshallese god of fish
<i>Itōknonu</i>	Summertime, when there are many flies
<i>iu</i>	Sprouted coconut, coconut "apple"
<i>jaajmi</i>	Dish of raw fish
<i>jāānkun</i>	Preserved breadfruit/pandanus
<i>jāānwūj</i>	sandwich
<i>jabōnkōnnaan</i>	Marshallese proverb
<i>Jabor</i>	A place, village on <i>Jālooj</i> Atoll

<i>jāibo</i>	A food, dumplings
<i>jal tutu</i>	A food, pickled fish in coconut cream sauce
<i>jālele</i>	Accompanying “sauce” to the staple starchy food
<i>Jālooj</i>	A place, Marshallese atoll of the southern <i>Ralik</i> Chain, former capitol
<i>Jebro</i>	Ancient Marshallese breadfruit god
<i>jekaro</i>	Coconut sap
<i>jekṃai</i>	Coconut syrup boiled down from sap
<i>Jemenei</i> Day	Marshallese Independence Day holiday, celebrated over Memorial Day weekend in May
<i>Jenrok</i>	A place, islet of <i>Mājro</i> Atoll
<i>Jepelpel in ke eju kāān.</i>	Motto of the RMI, reflecting the solidarity of its people
<i>jokkwōp</i>	A food, soup of soft rice or breadfruit
<i>jowi</i>	clan
<i>Kaibuke</i>	A person, historic Marshallese chief
<i>kajaba</i>	Cassava (<i>Manihot esculenta</i>)
<i>kajin etto</i>	Ancient language of the Marshall Islands
<i>kajur</i>	Non-chiefly class of traditional Marshallese society
<i>Kandikdik in/kōn iḳkwe</i>	Marshallese proverb promoting food sharing
<i>Kanniok kuwat</i>	Canned meat (i.e. SPAM, Vienna sausages)
<i>karkar</i>	To scrape meat from an old coconut
<i>keinabbu</i>	Papaya (<i>Carica papaya</i>)
<i>keemem</i>	Traditional Marshallese first birthday celebration
<i>Kili</i>	A place, island of the southern <i>Ralik</i> Chain

<i>kilok</i>	To squeeze juice from pandanus
<i>kojeiaat</i>	A food, preserved breadfruit boiled or baked without wrapping
<i>komṁool tata</i>	Thank you
<i>kōrkōr</i>	Traditional Marshallese mid-sized outrigger canoe
<i>Kuwajleen</i>	A place, Marshallese atoll of the <i>Ralik</i> Chain, largest atoll in the world and site of the Ronald Reagan Ballistic Missile Defense Test Site
<i>kweet</i>	octopus
<i>ḷaim</i>	Lime (<i>Citrus aurantifolia</i> .)
<i>lamorin</i>	Ancestral land
<i>Letao/Etao</i>	Marshallese trickster demigod
<i>Likiep</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain
<i>Liok tūt bok</i>	Marshallese saying meaning to stay grounded
<i>ḷoje koḷḷa</i>	Marshallese expression equating the stomach to a trash can
<i>lukor</i>	A food, pounded meat of the sprouted coconut
<i>mā</i>	Breadfruit (<i>Artocarpus altilus</i>)
<i>mā kalel</i>	Breadfruit in coconut milk
<i>maṛko</i>	Mango (<i>Mangifera indica</i>)
<i>ṁabuñ</i>	Breakfast
<i>Majol</i>	Cognate for “Marshall”, used as the adjective “Marshallese”
<i>Mājro</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain, current capitol of the RMI
<i>ṁakṁōk</i>	Polynesian arrowroot (<i>Tacca leontopetaloides</i>)
<i>ṁanit</i>	Custom
<i>markinenjojo</i>	Beach pea (<i>Vigna marina</i>)
<i>Mejit</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain

<i>mejwaan</i>	A variety of breadfruit popular in the RMI, it has a chestnut-like seed
<i>Mile</i>	A place, Marshallese atoll of the southern <i>Ratak</i> Chain
<i>mọ</i>	Taboo
<i>mokwaṇ</i>	Breadfruit/Pandanus juice that has been cooked and preserved
<i>ṁōñā</i>	Food/eat
<i>ṁōñā in jibboñ</i>	Breakfast
<i>ṁōñā in raelep</i>	Lunch
<i>motu/āne</i>	Islet in an atoll
<i>Namdik</i>	A place, Marshallese atoll of the southern <i>Ralik</i> Chain
<i>namonamo</i>	Pancakes
<i>ni</i>	Coconut (<i>Cocos nucifera</i>)
<i>Nijir tomede eo</i>	Marshallese expression of energized friendship
<i>nin</i>	Beach mulberry (<i>Morinda citrifolia</i>)
<i>Nitijela</i>	Parliament of the RMI
<i>peru</i>	Pandanus pulp and juice mixed with grated coconut and coconut oil (and optionally with arrowroot starch), wrapped in breadfruit leaves and boiled or baked
<i>piik</i>	Pork
<i>Pikinni</i>	A place, Marshallese atoll of the northern Ralik Chain, site of nuclear testing (including the Bravo Shot)
<i>piteto</i>	Potato (<i>Solanum tuberosum</i>)
<i>poļej</i>	Very ripe breadfruit baked in coconut milk
<i>raij</i>	Rice (<i>Oryza sativa</i>)
<i>rak</i>	Summer season

<i>Ralik Chain</i>	Western (Sunset) archipelago of the Republic of the Marshall Islands (RMI)
<i>raanke</i>	To grate coconuts
<i>Ratak Chain</i>	Eastern (Sunrise) archipelago of the RMI
<i>ri-jerbal</i>	Traditional Marshallese working class
<i>ri-medo</i>	Traditional Marshallese navigators
<i>ri-paelle</i>	A Euro-American person
<i>Runit Dome</i>	A place, decrepit nuclear waste repository on <i>Āne-wātak</i> Atoll
<i>taituuj</i>	A food, dish made from bananas
<i>tonaaj</i>	A food, Marshallese-style donut
<i>Wūjae</i>	A place, Marshallese atoll
<i>Wūjlañ</i>	A place, Marshallese atoll
<i>um̧</i>	Earth oven
<i>um̧ in gajolin</i>	Gasoline oven
<i>Utrök</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain
<i>wa</i>	Canoe, general term
<i>waini</i>	Coconut, ripe for copra
<i>wāto</i>	Tract of land on a Marshallese atoll
<i>wijpil/pilolo</i>	A food, dish made from bananas
<i>wōd/jeņ</i>	Clam, general term
<i>wōn</i>	Sea turtle
<i>Wotje</i>	A place, Marshallese atoll of the <i>Ratak</i> Chain
<i>wud</i>	Piece from the pandanus fruit
<i>zori</i>	“Flip-flop” style footwear