Journal of Linguistic Geography (2017) **5**, 67–85. © Cambridge University Press 2018
doi:10.1017/jlg.2017.4

ORIGINAL RESEARCH

Mapping the linguistic landscapes of the Marshall Islands

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This paper examines code choices in the written linguistic landscape of the Republic of the Marshall Islands (RMI). Due to a history of language imposition, the Marshall Islanders have long been denied the opportunity to express their linguistic identity in the public domain. A recently proposed bilingual language policy, which requires all public signs to be Marshallese-English bilingual, aims to change this status quo. We map language choices in the linguistic landscape of the RMI at the cusp of this policy with an eye on the stakeholders, production processes, and audiences involved in the creation and reception of the linguistic landscape. State-of-the-art geographical and regression analyses model the factors that govern code choices in the linguistic landscape of the RMI. Our findings allow us to pinpoint niches—both geographical as well as social—where the Marshallese assert their linguistic identity in the public realm.

1. INTRODUCTION

Linguistic Landscape (henceforth LL) research shares many of the concerns of variationist sociolinguistics, including the spatial distribution of linguistic heterogeneity, the ideological underpinnings of code choice, and the mechanisms of linguistic exclusion, as well as the assertion of language rights. Surprisingly, however, the two fields have traditionally seen very little overlap. Only in the last few years has the interface between variationist sociolinguistics and linguistic landscape research become the site of notable scientific inquiry. This newly emerging research paradigm, which Soukup (2016) has recently dubbed Variationist Linguistic Landscape Studies (VALLS), was galvanized by the incorporation of quantitative sociolinguistic methods of data coding and analysis into linguistic landscape research (Soukup, 2016; Amos & Soukup, 2016; Backhaus 2007). As Blackwood (2015:51) points out, "the marriage of two methodologies … is significant since the conclusions … are greater than the sum of their parts. [By] … start[ing] with a statistical approach, it is possible to examine more closely the function, authorship, materiality, and target audiences of signs." The merging of these two research traditions has not been without its problems, however, and the exploratory analysis reported here is testament to some of the constraints and affordances of implementing variationist principles into LL research.

Our paper investigates code choices in the written linguistic landscape of the Republic of the Marshall Islands (RMI), a small nation state in the South Pacific. The inhabitants of the Marshall Islands have long been denied the opportunity to express their linguistic identity in the public domain. There is evidence, however, that this is changing. In summer 2015, the Marshallese Ministry of Education proposed a bilingual language policy for the linguistic landscape which requires all public signs to be bilingual Marshallese-English (Marshall Islands Journal, 2015a).

The present article maps language choice in the linguistic landscape of the RMI at the cusp of the proposed policy. Our analysis relies on a geographical approach to spatial humanities combined with quantitative methods from variationist sociolinguistics (Bodenhamer, Corrigan & Harris, 2010; Dear, 2015). State-of-the-art geographical and regression analyses model the factors that govern code choices in the Majuro linguistic landscape, which we define here, following Landry and Bourhis (1997:23) as the entirety of private, administrative, and commercial signs that are displayed in public spaces.[1] Drawing on insights from language policy and language planning further allows us to investigate "not only … the [distribution of] signs but …. [also] who initiates, creates, places and reads them" (Marten, Mensel & Gorter, 2012). The findings reported here therefore not only confirm the fact that the hegemonic superpower dominates the linguistic landscape of the RMI (Johnson, 2015), but they also pinpoint niches—both geographical as well as sociolinguistic—where the Marshallese and their language assert their linguistic identity in the public realm. As such, our analysis goes beyond simple causalities, asking questions such as the following: Who are the stakeholders represented in the LL? Which agents dominate the LL? What are the political and commercial interests that impact the creation and negotiation of

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public space? How are private voices represented? By working in tandem with local policy makers, our work has far-reaching implications for language management and language planning since it provides important facts about the distribution of languages in contested space. Also, as we detail in Buchstaller and Alvanides (forthcoming), we are in the process of trialing human geographical models that allow us to share information about the status quo in the LL—as well as about the potential impact of the proposed changes—with key stakeholders in the RMI.

Our research has two specific aims. Firstly, this paper is a case study of a new, combined methodology. More specifically, we aim to explore the contribution which quantitative variationist methods, geospatial models, and visualization tools can make to LL analysis. Secondly, our mixed methods approach allows us to assess the geosemiotic status quo in the RMI before the implementation of the newly proposed language policy. By identifying the factors which facilitate or hinder the public expression of indigenous linguistic identity in the RMI, our research has potential impact on future language management decisions.

2. LINGUISTIC LANDSCAPE RESEARCH

"Language is the symbol of ethnic identity 'par excellence'" (García, 2012:81). The linguistic landscape, where linguistic actions become public demonstrations of code choice, is thus far from neutral. Rather, language selection on public signs is "inseparable from political arrangements, relations of power, language ideologies and [users'] views of their own and other's identities" (Pavlenko and Blackledge, 2004:1-2). LL research examines these "links between landscape and identity, social order and power" (Rubdy, 2015:2) with the aim to lay open the language hierarchies and the ethnolinguistic struggles they engender. This is particularly pertinent since a wealth of studies on bi- and multilingual communities have revealed that the social context can prevent individuals or groups from accessing their own linguistic resources for public language practices (Heller, 1987, 2009; Alexander, 2006 inter alia). Consequently, the linguistic landscape often "does not reflect the language demographies or how they confirm or resist existing or presumed language prestige patterns and hierarchies" (Marten, Mensel & Gorter, 2012:1). Such linguistic erasure or underrepresentation tends to result in the contestation of language domains through various types of social action. Consequently, the linguistic landscape becomes "a site of conflict … and dissent … arising from the mechanics of language policy, language politics [and] language hierarchies" (Rubdy, 2015:1, see also the papers in Hélot, Barni, Jannsens & Bagna, 2012; Rubdy & Ben Said, 2015).

LL research therefore affords not only important information about the use and the status of different languages. It also "inform[s] us about and exhibit[s] some of the underlying ideas, ideologies, conflicts and power struggles between different stakeholders" (Gorter, 2012:11). While the focus of this article lies on the "legal battle for the representation" of the Marshallese language in the linguistic landscape of the island state (see Trumper-Hecht, 2010:238), it is important to bear in mind that the struggle for ethnolinguistic visibility also plays out in the schooling system and the press (MIPS, 2015; Lowe, Penland & Heine, 2005; Cappelle, 2015; Walsh, 2012; MIJ 2015d). The present paper examines the geographic and sociopolitical factors which impact code choices in the linguistic landscape of the Marshall Islands with an eye on the proposed bilingual language policy for public signposting.

3. THE LINGUISTIC LANDSCAPE OF THE RMI

The small island states of the South Pacific offer a particularly revealing arena for linguistic landscape research since many of them are embroiled in an ongoing struggle for their linguistic "rights to the city"[2] (Lefebvre, 1968). Like most of Micronesia, the RMI was placed under US trusteeship from the 1940s until its independence in the mid-1980s and it has been in a Compact of Free Association with the United States ever since. Exocentric forces are thus predictably powerful in the RMI. Indeed, as is the case in "all polities in the Pacific Basin region …. English has official status" in the RMI, which it shares with Marshallese (Bauldauf & Nguyen, 2012:627).

English and Marshallese are thus important linguistic resources in the RMI but they are so for very different domains and objectives: Marshallese, a language with a proud and flourishing oral tradition (Miller, 2011; Tobin, 2002; Joash, Kowata & Stone, 2000) and a small but increasing literacy component (Jetnil-Kijiner 2014), is "historically and inherently predominant in the country" (MIJ, 2015c). It is the language of everyday oral conversation amongst most Marshallese citizens and an important symbol of ethnic identity. A fluent command of the Marshallese language is a prerequisite for many governmental positions and various arenas of the private sector (such as the increasing amount of employment opportunities in climate change/sea level rise/sustainability). English, on the other hand, is not only the global language of communication for the Marshallese people. It is also the lingua franca they use with a wealth of (semi-)permanent international actors on their own territory, including NGOs and most health care workers, the people working on the many fishing

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vessels moored in their lagoons, trading companies and the majority of salespeople in the shops that line their high street (most of which are Chinese-owned), other foreigners including the lion's share of their children's high school teachers, and the U.S. military that has taken over some of their islands (see Buchstaller and Willson, forthcoming).

Due to a legacy of language imposition by the colonial power, a short history of indigenous literacy, and "the mundane facts of economic, political and military dominance," the Marshallese language has long been denied visibility in the public domain (Alexander, 2006:241; see also Ferguson, 2012). The linguistic erasure of Marshallese is particularly conspicuous in the linguistic landscape. Gif Johnson (p.c., 2015.), a veteran journalist and long-term resident in the Marshall Islands has pointed out that in the 1980s the only signs written in the Marshallese language were the "no tab" notice in bars, a typical case of punitive language use (Angermeyer, 2016). However, there are signs that this is changing: Robert Early (p.c., 2015), a linguist consultant of the Marshallese public school system and frequent visitor to the Marshall Islands remarked that "it is heartening to see some Marshallese signs…. When I first visited here about 10 years ago all signs were in English."

The Marshallese struggle for semiotic appropriation of the public sphere was brought into the fore in summer 2015, when the RMI government proposed two status planning initiatives which aim to strengthen the ethnolinguistic vitality of the Marshallese language by increasing its domains of use. More specifically, the RMI government put forward the following measures: A *language education policy reform* aims to facilitate the development of functional bilingualism by increasing the use of Marshallese as a language of instruction at all levels of secondary school (Ministry of Education, 2015:3; MIJ, 2015a). Importantly for our purposes, the Ministry of Education also proposed a *bilingual language policy for the linguistic landscape*. Bill #85 requires all "public notices and … public signs, press notices, publicity campaigns, advertisements and exhibitions [to] … include both Marshallese and English languages" (MIJ, 2015c).

In this paper, we interpret the ongoing language managing initiative in the RMI in line with the concept of "languaging…[i.e. the] negotiating, resisting, empowering of … the speech [and language use] of [an] ethnic community [by] … language managing" (García, 2012: 85-6, 91). Since our analysis considers the written linguistic landscape of the Marshall Islands at the cusp of this new legislation, i.e., before the implementation of Bill #85, the results presented here have an important temporal element (see Pavlenko, 2010; Blackwood, 2015). Indeed, by feeding back our findings to the local stakeholders of the proposed language policy reform, we hope that our research can inform the ongoing process of language management in the RMI.

4. DATA AND METHODOLOGY

Given the complexity of spatial practices in postcolonial and postmodern societies, Hélot, et al. (2012:18) point to the need for cooperation between scholars from different disciplines. Such interdisciplinary research gives us access to "multiple methodological approaches … [which in turn allow us] to decipher the way public space is symbolically constructed," maintained, contested, and reshaped. To date, however, the lion's share of LL research has not taken on board advanced geospatial and visualization methods or indeed the variationist standards of data sampling, collection, and coding (Blackwood, 2015). The mixed methodology approach we trial in this paper therefore aims to provide an initial illustration of how to bridge quantitative sociolinguistic methods, geospatial analysis, and visualization methods. We will also appeal to qualitative methods from critical analysis/language policy for the interpretation of the spatial and sociodemographic patterns in the LL. Thus, our analysis should be seen, as discussed by Jaworski and Thurlow (2010), in the context of social science research that uses mixed models to investigate the discursive creation of space in the sense that "linguistic tokens such as billboards and banners are not added on to a given physical space, but are part of what makes and shapes this space, giving it a cultural meaning" (Papen, 2012:59).

Our sampling method follows Ben-Rafael et al. (2006:11) in focusing "on those parts of the cities that have prolific [textual] LLs… where the major commercial activity takes place and the principal public institutions are located." Given that the vast majority of the RMI consists of rural seascapes with very few textual signs, our research is concentrated on Majuro, the capital atoll of the island state (see Map 1). The easternmost populous areas of Majuro (Rita, Djarrit, Uliga and Delap, see Map 2) tend to be labelled 'urban' by planners and the local press (EPPSO, 2012; Johnson, 2015) and it is here that the majority of textual signs are located.[3] For our research, we decided to use "the bridge" as a cut-off point, an emic ecological boundary which divides the populous industrial and residential areas of the eastern side from the much less densely populated, more rural areas of the west.[4]

We used a walking narrative methodology with a local informant (see Banda & Jimaima, 2015) who also helped us translate the Bilingual/Marshallese signs. Over the course of two months (July and August 2015) we took almost 2500 geotagged photographs of signs in the LL along the main traffic artery as well as smaller secondary streets in the area stretching from the tip of

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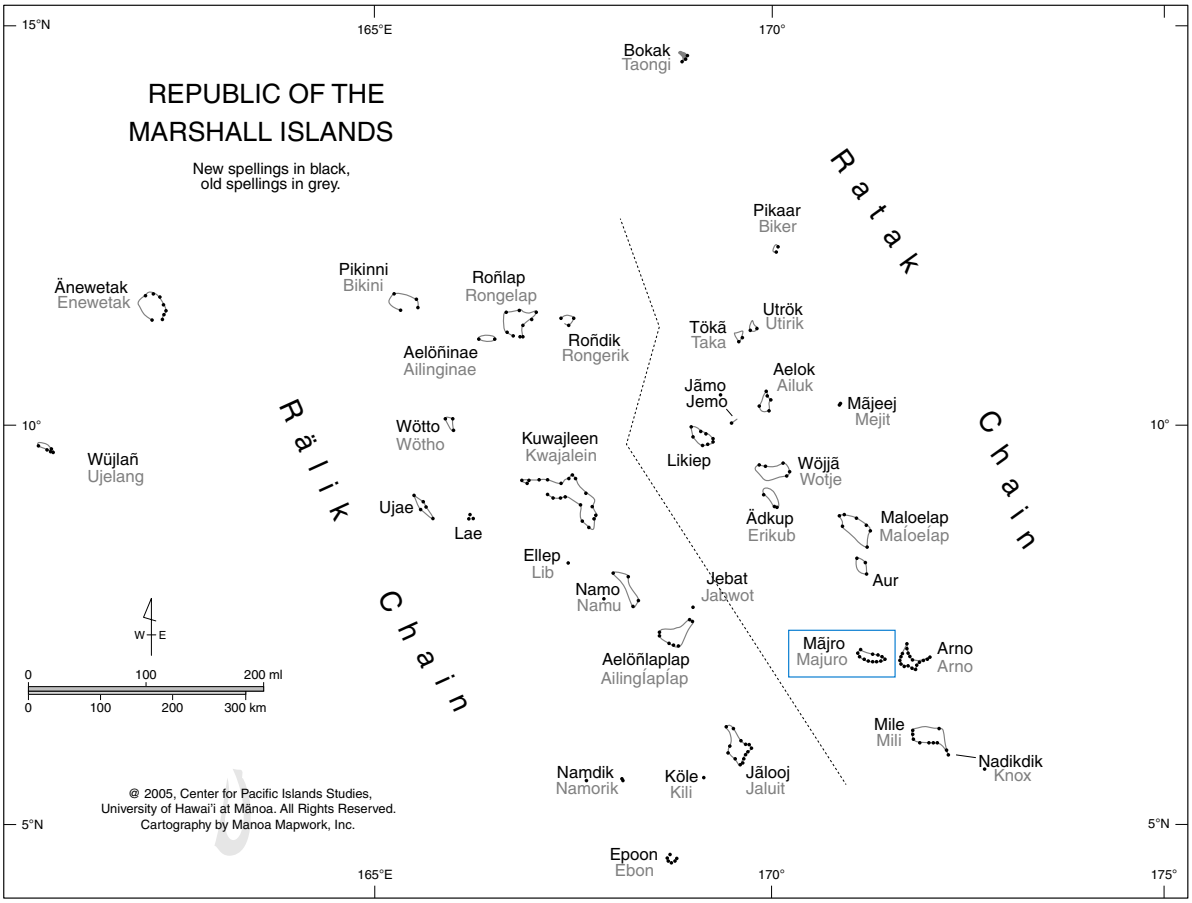

Map 1. The Republic of the Marshall Islands (Source: Center for Pacific Island Studies, University of Hawaii at Manōa, 2005)

Rita until the bridge (Map 2). While LL research has not yet reached a consensus regarding choices of data collection and sampling, we decided to follow the variationist sociolinguistic "principle of accountability" (Labov, 1972) by including in our sample all signs we were able to read with the naked eye (hence big enough to decipher without using the zoom of our camera) when standing on the street.[5] This includes signs as varied as advertisements[6] (including "repurposed" materials such as the display of wrappers for commercial purposes in shop windows, see Banda & Jimaima, 2015:654), shop signs, official governmental notifications, decorative signs, but also notices such as the *No parking* or indeed *No spitting* signs that some residents placed in front of their driveway.

LL researchers disagree on the treatment of "mobile texts such as bus tickets or cash receipts … and waste materials on the street such as wrappers and other rubbish, also containing texts" (Gorter, 2012:11). Following Kallen (2010:53), our analysis took into consideration semi-permanent, "transient signage, as found in graffiti, … posters, [permanent advertisements and signs that were clearly long-term use of initially] short-term signs and stickers." We did not, however, consider more ephemeral objects such as parked cars (unless it was evident that they were stationary), trash and the announcements of a big educator conference that lined the streets in Majuro for about 10 days and then disappeared. As a rule of thumb, thus, our analysis includes signs that we would expect to still be at the same place about a month later (see Scollon & Scollon, 2003). Our corpus therefore comprises a complete inventory of the (semi-)permanent signs that were linguistically accessible from the street in the urban center of Majuro Island, Majuro Atoll, the Marshall Islands.

The heterogeneous nature of signposting in the RMI raised the important question of how to sub-classify single signs into larger categories. While the LL research literature hosts different definitions of frame (see Roeder & Walden, 2016), our approach relies on a combined epistemology that draws on both an interactional sociolinguistic as well as a spatial conceptionalisation of frame. Backhaus' (2006:55, 2007:66) of a sign as "any piece of written text within a spatially defined frame" provides us with a very useful starting point since it allows us to consider individual postings as separate signs provided they are spatially delimited, for example by the perimeters of the carrier material, their

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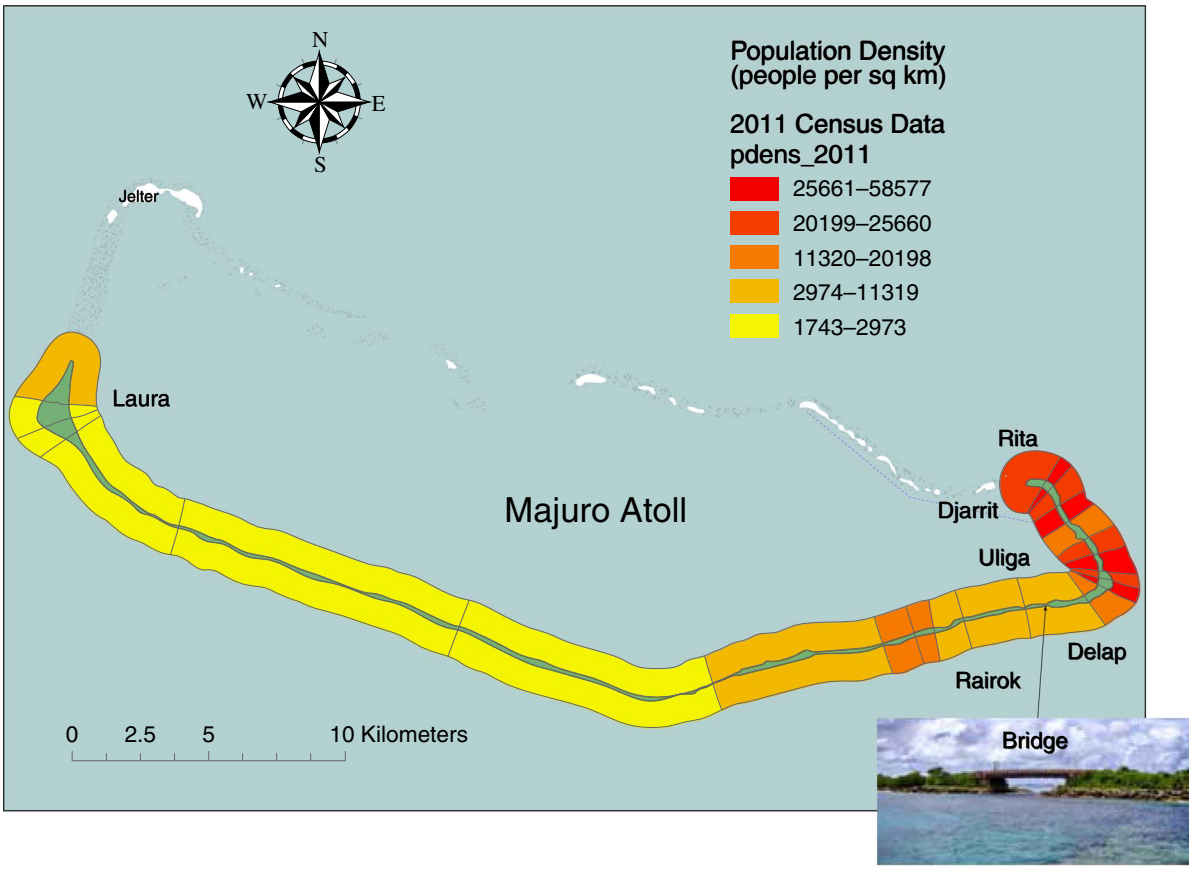

Map 2. Population density (people per square kilometre) on Majuro atoll (2011 Census available from EPPSO http://rmi.prism.spc.int/ Mapping © The authors)

contrastive choice of script etc. However, scrutiny of the data revealed that purely spatial considerations were insufficient parameters since adjacent—or indeed overlapping—signs tend to differ in crucial respects. For example, a shop window might contain (i) graffiti, (ii) an anti-alcohol campaign by the government, and (iii) a group of signs informing customers of the availability of reef fish, betel nut, and coconut oil. Our variationist background compelled us to search for factors that allow us to group individual tokens into larger categories. We decided to rely on the interactional sociolinguistic concept of "footing" (i.e., the "stance, or posture" expressed in the sign, see Goffman, 1981:128) because it allows us to consider the positionality of the emitter of the individual sign.[7] Following this heuristic, we would thus interpret the expository shop window as hosting three types of signs: the simple frames (i) and (ii) produced by different emitter groups, as well as the discontinuous sign produced by the same emitter (iii).[8]

Note in this respect that one and the same person can assume different stances towards the signs they produce and/or display and thus be coded as different emitters. To remain with the example above, the shop owner could have posted, apart from the signs advertising reef fish or betel nut, a sign advertising an upcoming volleyball match and a sign prohibiting parking in front of the building, therefore projecting different respective aspects of self by placing these postings. Consequently, we would code these signs as stemming from three different emitters: The owner of the shop, a member of a local sports club, or the inhabitant of the flat behind the shop.[9]

The photographs were geotagged for coordinates, translated, and hand-coded for a range of determinants including the professionalism of the sign (whether it was professionally printed, a computer printout, or handwritten), their relative geographical location (to be discussed in more detail below), the land parcel (known as *wāto*) in which they are located,[10] as well as their emitter. A series of visualization procedures and logistic regression analyses allowed us to explore which factors condition the use of Marshallese or bilingual signs in the RMI linguistic landscape.

Four large groups of signs required special attention. These are signs warning about buried cables (Figure 1), the Japan-sponsored trash cans (Figure 2), the EU-sponsoring message on water tanks (Figure 3), and

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Figure 1. "Caution: buried cable. Before digging in this vicinity please call telephone company"

Figure 2. Trashcan "From the people of Japan"

Figure 3. Water tank "Provided by the European Union"

the Taiwan-sponsored street lights (Figure 4). What these signs, which we will call street furniture in the remainder of this paper, share is that they are

Figure 4. Street light "Love from R.O.C (Taiwan)"

invariable: The language used is consistently English and there is no variability in terms of presentation, including font and design. Variationist sociolinguistic methodology requires excluding such categorical tokens from the analysis and treating them separately (Blake's 1995 "don't count" category), since there is no variation amongst a paradigmatic set of different "ways of doing or saying the same thing" (Chambers & Trudgill, 1980:50; see Labov, 1972).

Another important aspect that differentiates street furniture from all other signs in the LL of the RMI is the fact that they index the relationship of dependency between the Marshall Islanders and their benefactors. Since these signs (and the objects they denote) have been manufactured elsewhere and then donated, the RMI lacks the linguistic autonomy (and arguably also the moral authority) to change the code imprinted on them (Gans, 2003; Robihaud and de Schutter, 2012). But if the Marshallese *could* change them—for example by imposing the new Bill #85 on their sponsors—all street furniture would be changed in bulk, a radically different process from the piecemeal, one by one change, that would be required to change all other signs in the LL of the RMI. In the following, we will thus discuss sponsored street furniture as a separate category.[11]

5. FINDINGS

We will first present the overall distribution of linguistic choices in the LL of the Majuro conurbation. As a second step, we will explore the spatial distribution of codes in the linguistic landscape and the social, political, and ideological factors which condition the RMI semiotic space. Tables 1a and 1b illustrate the frequency of languages used on signs in the linguistic landscape of

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Table 1a. *Distribution of signs in the Majuro*

LL without street furniture		
	N	%
English	**1410**	**71**
Marshallese	221	11
E-M bilingual	291	15
other	28	1
other-English bilingual	36	2
TOTAL	1986	

Table 1b. *Distribution of signs in the Majuro*

LL with street furniture		
	N	%
English	**1844**	**76**
Marshallese	221	9
E-M bilingual	291	12
other	28	1
other-English bilingual	36	1
TOTAL	2420	

the capital atoll. It is obvious that—whether calculated with or without the invariable street furniture—the English language makes up the vast bulk of signs in the Majuro LL (71%, N = 1410 and 76%, N = 1844). If we exclude street furniture, Marshallese and Marshallese-English bilingual signs are 11% (N = 221) and 15% (N = 291) of all tokens. Hence, if we examine the extent to which indigenous language is represented on signs in the urban LL, Marshallese appears in only about a quarter of all possible instances. Bilingual signs, the declared aim of the recently proposed Marshallese language policy, only occur in about 15% of all cases, even fewer (12%) if we include street furniture.

Languages other than English or Marshallese do not play much of a role in the LL of the RMI, amounting to only 1.4% of all signs (and 2% of all bilingual signs consisting of English and a language other than Marshallese, excluding street furniture). The underrepresentation of other languages in the LL is unexpected given that the RMI maintains the third largest ship registry in the world (Roussanoglou 2015), the majority of which are flags of convenience (https://www.hg.org/article.asp?id=31395). Note in this respect that the category "other languages" is dominated by Chinese (Mandarin, Cantonese and especially Taiwanese), which is unsurprising given the large (but unaccounted for in the official census) Chinese minority who owns the vast majority of shops and restaurants that line the Majuro main street.

5.1. Geo-spatial Analysis

As a first step, we report on the geographical distribution of languages in the LL. For our analysis, we decided to differentiate between the lagoon-side and the ocean side of the atoll because this geographical axis stands for fundamentally different settlement patterns in the Majuro conurbation as shown in the maps below. The lagoon side of the island, which is transversed by the main transport artery of the island, is relatively built up with a large number of two- (sometimes three-)storey buildings. The lion's share of larger economic enterprises and most governmental and official buildings are situated along the main road on the lagoon side. The ocean side on the other hand is much less built up and tends to be comprised of residential neighborhoods with single-storey structures. We also defined a Bridge area that reflects a significant change both in land use and in population density, as shown in Map 3a. Our spatial division of the Majuro conurbation into 3 distinct geographies reflects local practices of orientation and cultural norms.

An alternative division could involve spatial differentiation by facilities and services, informed by Majuro's detailed land use patterns shown in Map 3b. However, the official land use map (EPPSO, 2012) fails to capture mixed land uses or account for the fact that many households on the Lagoon side operate small family shops and informal street-food stalls from their dwellings. In addition, the ocean side generally lacks administrative buildings and larger economic outlets, apart from a school and a college that stretch from lagoon to ocean side shown in Map 3b.

Maps 4a-c, which depict individual signs as data points, reveal that the majority of signs in the urban Majuro LL follow the main thoroughfare on the lagoon-side of the atoll. Not surprisingly, there are fewer signs in the small backstreets on the ocean side of the island. A comparison between the maps reveals that the English-language signs depicted in Map 4a have a much higher density of data-points than either bilingual (Map 4b) or Marshallese (Map 4c) signs. This result supports our previous finding that English has a greater presence in the LL of the RMI (see Tables 1 and 2).

In order to bring out the differences between the code choices used on the signs in the LL, we resorted to the human geographical methodology of creating density maps, also referred to as heat maps (Eck et al., 2005). This is done by calculating the concentration of points (where pictures were taken) within a specified distance and representing this concentration as a continuous surface across space. Darker areas on the heat map depict a higher concentration of pictures of a specific kind (in our case a language). The resulting language-specific heat maps allow us to show where in space there is a concentration of one particular language (such as English), as illustrated in Maps 5a-c.

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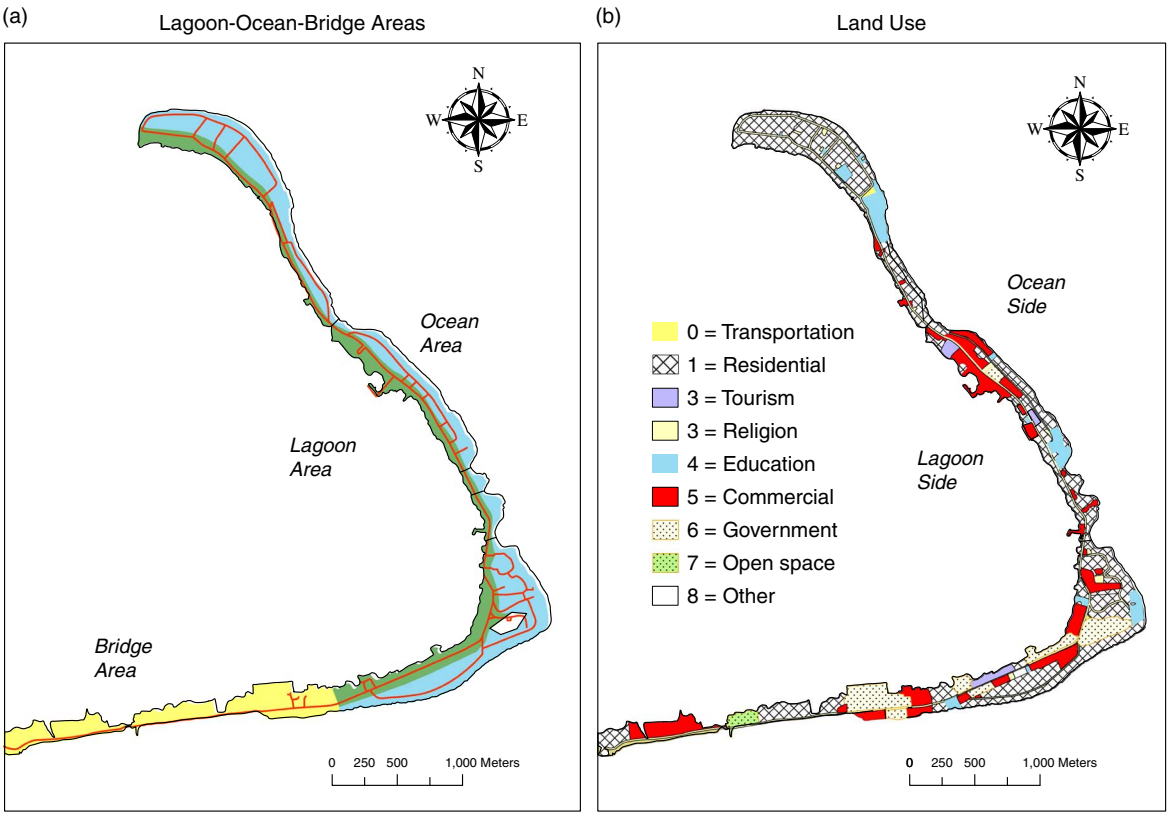
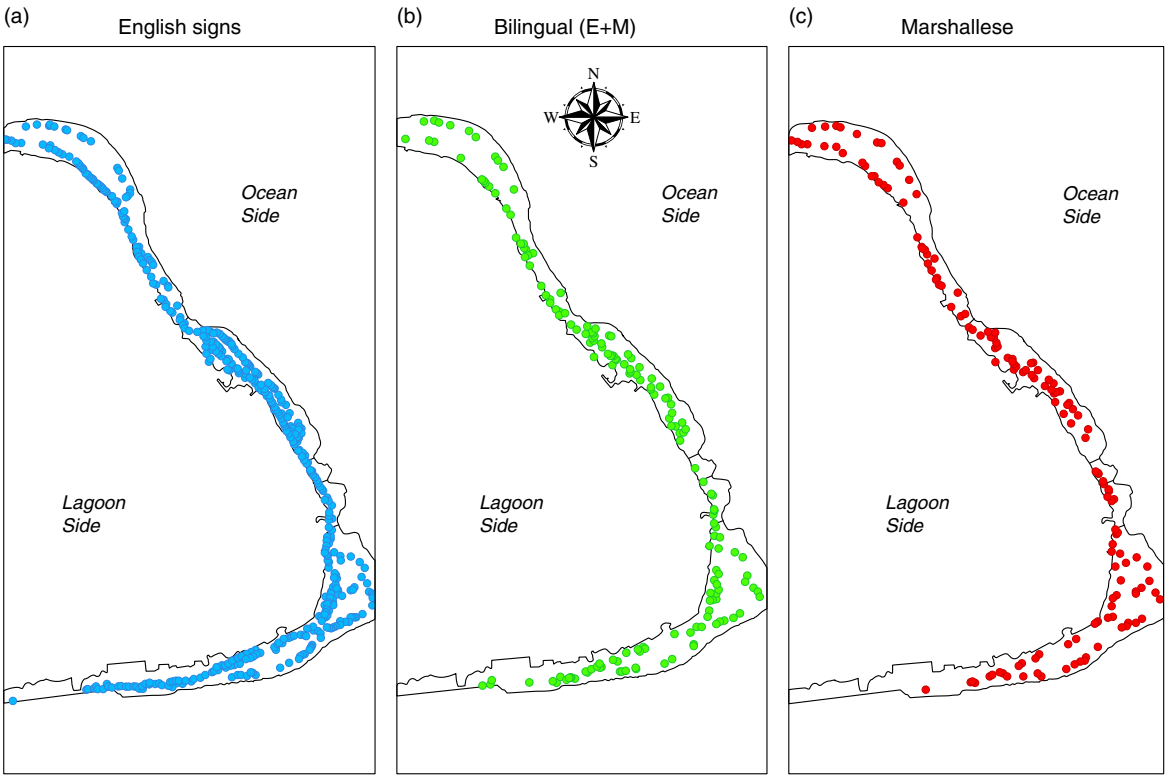


Map 3. a: Division of study region into Lagoon, Ocean and Bridge areas to reflect daily activities. b: Official land use map for the eastern part of Majuro Atoll. Mapping © The authors.



Map 4. a-c The use of English, English-Marshallese bilingual and Marshallese signs in the urban center of Majuro

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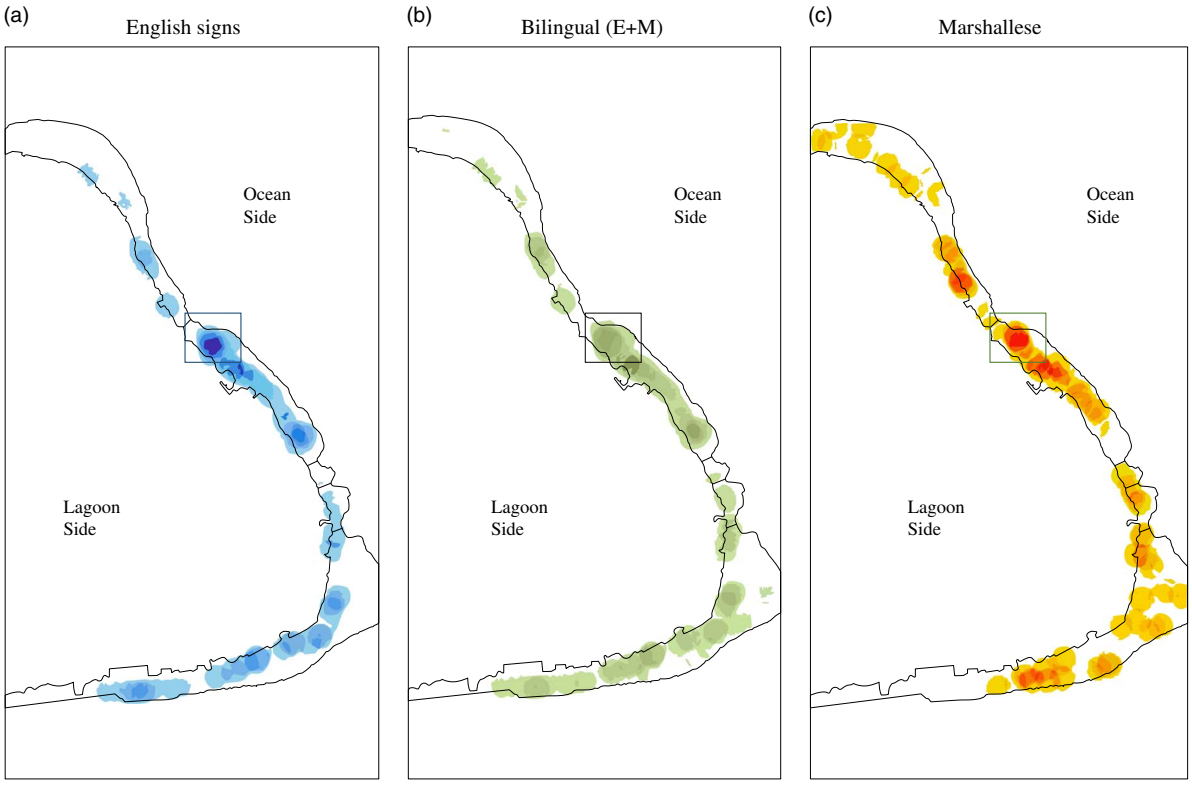

Map 5. a-c Heat map of English, English-Marshallese bilingual and Marshallese signs in the urban center of Majuro (for the distribution of cables and street furniture consider Appendix 1)

The comparison between the three language-specific heat maps reveals an area of concentration (boxed in all maps) where the three languages have a very high presence, i.e., their zones of high density overlap. This geographical area is the commercial center of the Majuro conurbation, called "downtown" by the residents and the local press (Johnson, 2015). The downtown area comprises a small square where the main bank, the post office, the hardware store, several dentists, a few fast food outlets, the bus station, the boat landing, a souvenir shop and one of the two main restaurant/hotels of Majuro are situated (see Figure 5). Evidently, Marshallese, English and bilingual signs are heavily represented in this area, as shown in Maps 5a-c.

But whereas bilingual and English signs exhibit similar patterns—with the sole difference that English-only signs are considerably more frequent across the LL—Map 5c suggests that Marshallese signs are distributed somewhat differently. Marshallese-only signs have a higher presence in the residential areas of the ocean side, including in the most eastern atoll bulge that represents the Delap area as well as at the top of Rita. As we pointed out above, these ocean side areas comprise mostly residential neighborhoods interspersed with very few smaller Marshallese and family-owned/run shops. We will revisit this finding below.

Figure 5. The downtown area of Majuro

The very south of our geographically defined area of analysis is where the Majuro industrial zone is situated, named "bridge" area in our analysis. In this sector, the atoll narrows down to about 200m in width. The main thoroughfare, which becomes the only publicly accessible road, is lined on both sides by large commercial

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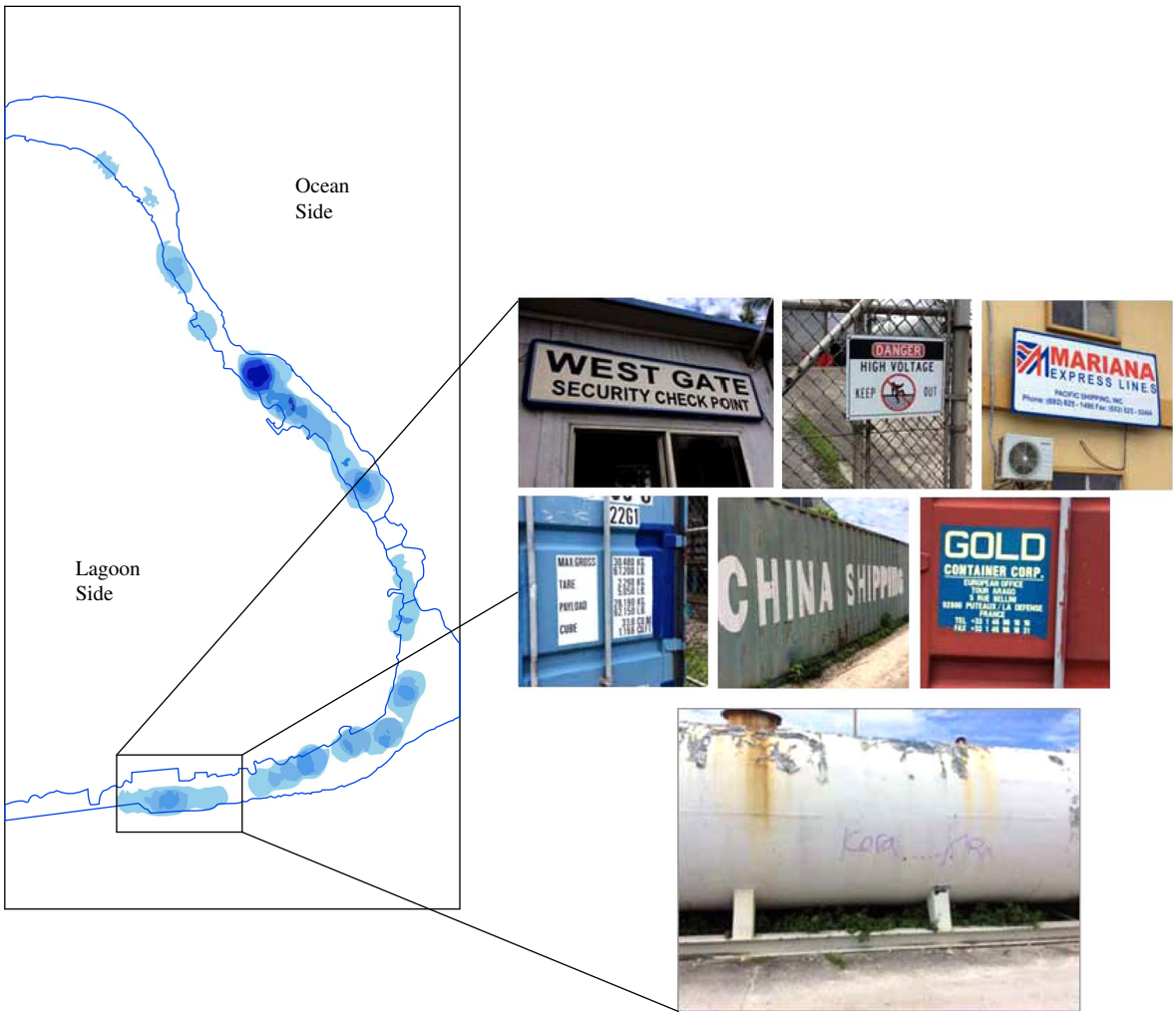

Figure 6. The predominantly English LL in the industrial zone

enterprises and industrial outlets, including shipping companies and international dealerships, the main oil refinery and the electricity plant. As Figure 6 illustrates, the majority of all signs here are English, which is unsurprising given that many of the signs displayed in this area are foreign-made and imported. Some signs are on containers, which are invariably shipped in from elsewhere (see the middle row of Figure 6). The industrial zone thus brings to the fore the contrast between the hegemonic and ratified connotations of the "official" language of the commercial superpowers (English) and other trading lingua francas in the Asia Pacific region (i.e., Chinese), as opposed to the lone unofficial non-ratified graffiti in Marshallese.

5.2. Variationist Analysis

To explore the systematic interplay of the factors that condition code choices in the linguistic landscape of the RMI, we ran two separate logistic regression analyses in R using the package lme4 (Bates et al., 2016). As a first step, we explore the factors that constrain the occurrence of the Marshallese language (alone or on bilingual signs) in the LL of the RMI. Marshallese-only and Marshallese-English bilingual signs were thus collapsed and set as the response level. A second model tested for the conditioning factors for the occurrence of signs that fit the bilingual language policy (Bill #85) recently proposed to the Marshallese parliament. This analysis set the response level at Marshallese-English bilingual signs. The *wāto* (strips of land traversing the atoll from the ocean to the lagoon side) in which the sign occurred was included as a random factor. Our analysis considers three different independent variables: the emitter of the sign, its positionality in space (lagoon vs. ocean vs. industrial zone), and the level of professionality with which the sign was produced. We will now briefly discuss the coding involved in these analyses.

The factor 'emitter' was coded for the following levels: signposting by the Marshallese government,

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signs posted by other official but non-governmental authorities (such as the World Bank or the national fishery board) and signs by shop owners. We also considered signs by private individuals, which mainly includes graffiti as well as the political campaign posters that were stuck everywhere during the four months leading up to the parliamentary election on 16 November. Signs were coded as being produced by an 'individual' when the voice on the sign was clearly not representing a commercial agent or administrative agency but where the sign-poster was acting in individual capacity. Cases where the emitter(s) could not be determined (such as those advertising a music festival in the park or a volleyball tournament) were included in the category 'other.' Since the Marshallese language is never (or extremely rarely) used in shipping notices on containers, on supra-national advertisement posters and for the signposting of large commercial outlets (such as shipping and insurance agencies, the oil industry, fisheries etc.), the analysis presented here excludes these categorical contexts along with invariable street furniture.

The factor 'professionality of the sign' was coded as follows: professionally printed, computer printout or handwritten.[12] We will first consider the factors that condition the net occurrence of the Marshallese language (both alone and on Marshallese-English bilingual signs) in the LL of the Republic of the Marshall Islands before moving on to examine the constraints on bilingual signs.

Factors that condition the occurrence of the Marshallese language

As Figure 7 reveals, the Marshallese language is chiefly used in announcements by private individuals. The next highest frequency of occurrence of Marshallese can be found on signs produced by the government, followed by signs issued by non-governmental administrative agencies. On the other side of the coin, signs posted by the owners of small shops are predominantly

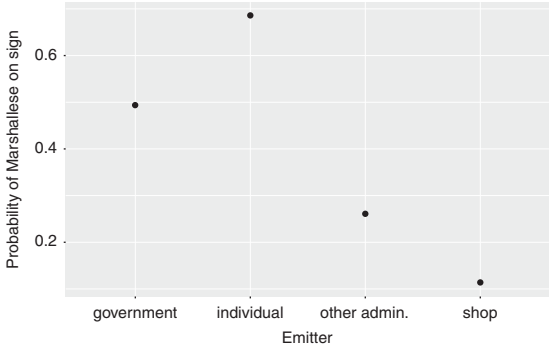

Figure 7. Effect of the emitter on the probability of occurrence of the Marshallese language on signs in the LL of the RMI.

in English. Crucially, while smaller shops and larger commercial outlets (not included in the regression analysis due to their categorical nature) employ very little or indeed no Marshallese in their signs, they do so for very different reasons. Whereas the vast majority of local shop-owners are mainland and Taiwanese Chinese who tend to use English as a local lingua franca with their mainly Marshallese customers, large multinational enterprises use English as the global language of international commerce. Overall, thus, English dominates both industrial and commercial signs because it has a very high "communicative range" (Coulmas, 1992: 89) as the global and the local lingua franca (Cenoz and Gorter. 2006:70). We will come back to the effect of the emitter below.

Table 2 reveals that the geographical placement of the sign affects the occurrence of Marshallese in the LL of the RMI. The results of the regression analysis fully support the spatial analysis illustrated in the heat maps (Maps 5a-c above, see also Figure 8): The industrial (bridge) zone in the east of the Majuro conurbation (the reference level in the regression analysis shown in Table 2) strongly disfavours the occurrence of the Marshallese language on signs. More Marshallese is used in the commercial area on the lagoon side of the atoll. The propensity of occurrence of the indigenous language rises even further in the residential ocean side of the atoll. Whereas the industrial zone is thus the main preserve of English, the commercial and administrative areas along the main thoroughfare are a mixed environment where Marshallese and global interests overlap. The dearth of industry, larger commercial outlets, and administrative offices along the backstreets on the ocean side and at the northern tip of the island, which is where the majority of the indigenous people live, on the other hand, gives the Marshallese the opportunity to linguistically appropriate their own semiotic space.

Scrutinizing the spatial distribution of our photographs in more detail reveals that it is *not* the case that there are quantitatively more Marshallese signs in these oceanside areas. Rather, the dominance of English signs is less acute in this geography so that the few shop signs and graffiti in Marshallese are not as swamped by the "category killer" English (Meyerhoff & Niedzielski, 2003: 525; see Spector, 2005). The comparative dearth of English-language signs outside of the industrial area, but in particular on the ocean side of the atoll, makes these residential areas a "glossotope" (Buchstaller & Alvanides, 2016), a geosemiotic zone in which Marshallese speakers can visibly operate in their own linguistic environment. At the same time, the use of the Marshallese language in these areas signposts the ethnolinguistic identity of the people who inhabit the oceanside and who indexically use code choice in

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Table 2. *Results of a logistic regression analysis fitted on the dataset (log-odds estimates and associated significance levels) which show the effects of individual factors on the occurrence of Marshallese (Estimates for non-significant predictors not included).*

Marshallese,	AIC: 1471.5	N = 1563	
Predictor	Factor Level	Estimate	p-level
Geography	Industrial Zone	Reference level	
	Lagoon	1.6189	0.0003 ***
	Ocean	1.8561	0.0000 ***
Emitter*	individual* prof.printed	Reference level	
production	government:handwritten	0.5127	0.3409
	non-gov. admin:handwritten	3.7266	0.0000 ***
	shop:handwritten	5.0988	0.0000 ***
	government:printout	−0.1767	0.8017
	non-gov. admin:printout	0.9226	0.1869
	shop:printout	2.3197	0.0009 ***

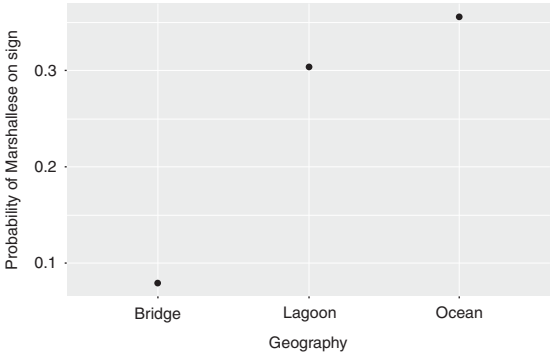

Figure 8. Effect of geography on the probability of occurrence of the Marshallese language on signs in the LL of the RMI.

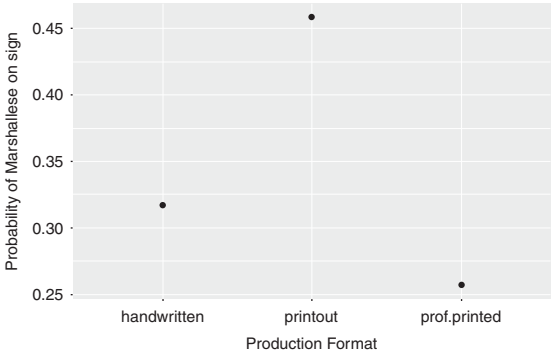

Figure 9. Effect of the production format on the probability of occurrence of the Marshallese language on signs in the LL of the RMI.

the semiotic ecology of the island landscape in order to mark these areas as *their* place. These findings fully corroborate previous LL research which has shown that language use in the LL does not merely transmit information (Cenoz & Gorter, 2006:70). Rather, by virtue of its connotational value, the writing on the wall has important constitutive force.

The use of English in commercial activities is also highlighted if we consider the level of professionalism with which the signs are produced. Figure 9 reveals that the most preferred environment for the Marshallese language are computer printouts. Other types of production method disfavor the occurrence of the Marshallese language. Note, however, that neither the emitter of the sign nor the production type are selected as main effects by the regression model. As Table 2 reveals, the professionalism of the sign significantly interacts with its emitter. In Figure 10, we plot the probability of occurrence of Marshallese on signs in the LL as a function of emitter and production method.

This method of display illustrates that the Marshallese language dominates in professionally printed signs and printouts for only two emitter groups: the government and individual signposters. For other emitters, professionally printed signs disfavour the occurrence of the indigenous language. Indeed, small shops and other administrative bodies predominantly use the local language on makeshift signs, in particular on handwritten signs. This finding relates in interesting ways to the issue of literacy (see Spolski, 2009): While Marshallese is traditionally an oral language (albeit with a long history of orthographization), literacy is almost entirely restricted to English. In a recent paper, Buchstaller and Willson (forthcoming) have suggested that "the distribution of [English and Marshallese] hinges predominantly on the medium of expression. While English is the primary language of standardised, professional written texts, …. Marshallese is the primary language of spoken registers." Given the strong link between orality and informal registers, it is not surprising that English as the global language of international commerce dominates in official contexts (signs produced by larger commercial outlets, shipping

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notices and administrative agencies) situated in industrial, administrative, or commercial areas and—for these emitters—also on professionally produced signs. In these domains, the Marshallese language is rare and only occurs on non-professional signs. By the same token, makeshift signs, such as handwritten signs and computer printouts, produced by small shop owners and other administrative bodies are skewed towards the Marshallese language.

Signs produced by the Marshallese government, by contrast, follow the RMI language management strategy which aims to give the Marshallese language exposure in an increasing number of official domains. Hence, as Figure 10 demonstrates, the Marshallese language predominates on professionally printed governmental signs. Note in this respect that a large proportion of the professionally printed signs and computer printouts produced by individual emitters are political campaign posters created by aspiring and incumbent politicians running for office. On many of these posters, Marshallese is used to provide the main campaign slogan, which often relates strongly to the Marshallese identity of the political candidate (see Figure 11).

The use of the Marshallese language in official domains and on professionally printed signs by the RMI government and individual signposters can thus be interpreted as a strong ethnolinguistic statement in the face of US American linguistic hegemony. We will revisit this point below.

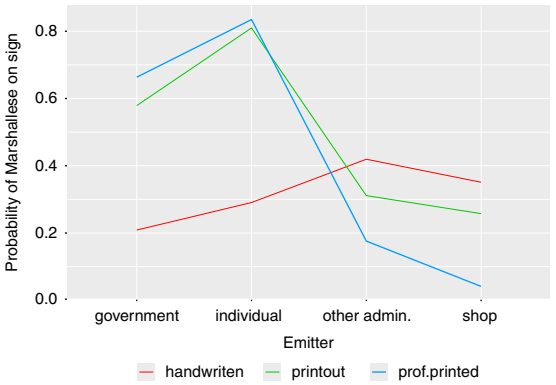

Figure 10. Interactive effect of emitter and professionality of production of the signs on the probability of occurrence of Marshallese on signs in the LL of the RMI

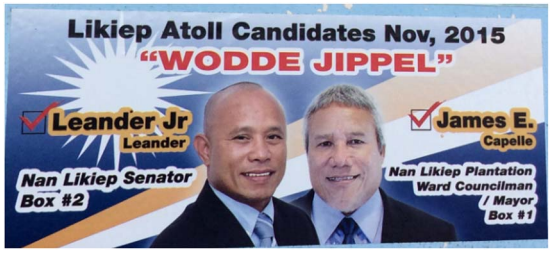

Figure 11. Campaign poster featuring a Marshallese-English bilingual sign ("It's going to be better, working together")

Factors that condition the occurrence of bilingual Marshallese-English signs

Table 3 examines the factors that impact the use of bilingual signs, the stated aim of Bill #85. While the regression analysis reported no main factors as significant predictors for the occurrence of bilingual signs, it reveals two interaction effects, one between the emitter and the professionalism with which the sign is produced and the other between the emitter and the geospatial placement of the sign. We will consider both in turn.

As Figure 12 reveals, the RMI government hardly ever issues handwritten signs in any language. By contrast, Marshallese-English bilingual signs make up a relatively large proportion of the computer printouts and professionally printed signs issued by the government. This finding is not surprising given the recent introduction of Bill #85. It further supports our argument that the use of Marshallese in the LL is part of the government's strategic aim to increase the visibility of the indigenous language in more—and especially formal—linguistic domains.[13,14] Amongst individual signposters—many of whom have political aspirations—bilingual strategies can be mainly found on campaign posters, which tend to be computer printed.

Without an official language policy that regulates the use of bilingual signs, administrative and commercial agents orient to the high communicative value of English (termed the Q-value by De Swaan, 1998, 2001; see also Coulmas' 1992 notion of communicative range) when making official announcements on professionally produced signs. These types of emitters relegate signpostings that contain the Marshallese language to more informal messages, conveyed on handwritten signs or computer printouts.

Note finally that our regression analysis supports the findings from our heat maps that the occurrence of bilingual signs is not differentiated by geography—at least not as a main effect (see Maps 5a-b). However, as Figure 13 reveals, there is an interesting interaction effect between the emitter and the geographical location of the sign. Hence, with the exception of individuals and shops, different emitters follow different strategies of bilingual signposting depending on the geographical placement of their signs. The government's propensity to signpost bilingual content on the Oceanside might be explained by the predominantly Marshallese residents of these areas, and thus the perceived need to appeal to the recipients of these signs. Non-governmental administrative bodies on the other hand tend to post

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Table 3. *Results of a logistic regression analysis fitted on dataset (log-odds estimates and associated significance levels) which show the effects of individual factors on bilingual signs (Estimates for non-significant predictors not included).*

Bilingual, Predictor	AIC: 1209.2 Factor Level	N = 1563 Estimate	p-level
Emitter* production	shop*prof. printed	Reference level	
	individual: handwritten	−2.2053	0.0001 ***
	government: handwritten	−5.6094	0.0000 ***
	non-gov. admin.: handwritten	−1.1489	0.0370 *
	individual: printout	−0.3884	0.5490
	government: printout	−1.3307	0.0156 *
	non-gov. admin.: printout	−0.9434	0.1038
Emitter* geography	shop*bridge	Reference level	
	individual: bridge	1.3425	0.3350
	government: bridge	−0.5646	0.5880
	non-gov. admin.: bridge	−12.7277	0.9889
	individual: lagoon	0.3368	0.5089
	government: lagoon	−0.7561	0.1390
	non-gov. admin: lagoon	1.2032	0.0429 *

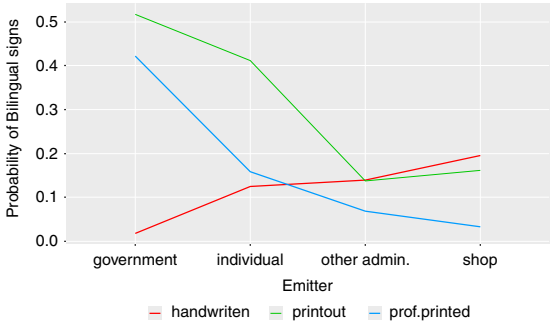

Figure 12. Interactive effect of emitter and professionality of production of the signs on the probability of occurrence of bilingual signs in the LL of the RMI

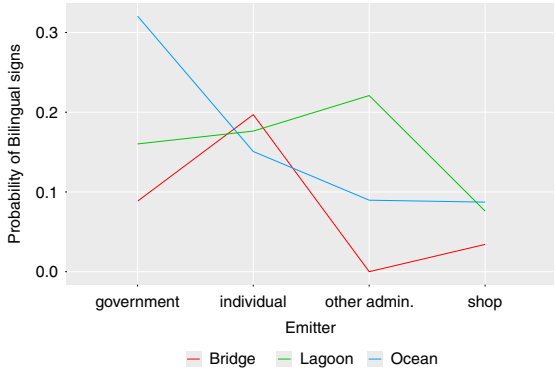

Figure 13. Interactive effect of emitter and the geographical location of the signs on the probability of occurrence of bilingual signs in the LL of the RMI

bilingual signs in the urban areas that form the commercial and administrative hub of the lagoon side. Thus, non-governmental agencies can be seen to follow the official governmental strategy towards bilingual signs on the main thoroughfare of the island but not so much in the hinterland and even less in the industrial hub we call 'the bridge'. Note in this respect that all emitters—apart from individuals—follow and indeed participate in creating a hegemonic English space in the industrial bridge area, where English-only signs proliferate (and thus bilingual signs are rare). It remains to be seen whether non-governmental administrative agencies will start implementing the bilingual strategy of Bill #85 in all geographies.

Our analysis thus reveals that, at the cusp of the implementation of Bill #85, the prospective language policy measure is not yet fully reflected in practice (Dunlevy 2012:61). Consequently, the Marshallese language continues to have relatively very low visibility in the semiotic ecology of the Majuro conurbation. Indeed, whereas state-issued signs and especially signs produced by individuals allocate the most space to the Marshallese language—especially when printed—commercial signs tend to reflect language choices that orient to the high communicative range of the default language English (Dunlevy, 2012:61). Note in this respect that while the RMI government leads all other emitters in the use of bilingual signs in official domains, even they have a long way to go in order to achieve the goal they set themselves in Bill #85.

6. DISCUSSION AND CONCLUSION

In this paper, we report on exploratory work at the interface between variationist sociolinguistics, geographical information science and LL research. Our aim was to develop an interdisciplinary approach that allows us to

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capture the heterogeneity in the geosemiotic public space of the RMI. At the same time, our work represents a case study of the relatively new paradigm VALLS (Variationist Studies in Linguistic Landscapes). The transposing of variationist sociolinguistic principles to LL analysis and the application of variationist standards of data sampling, collection, and coding into quantitative LL research are not without problems and respective work is only beginning to emerge (see Blackwood's 2015 review). Our paper is thus a stepping stone towards bringing these fields together, highlighting some areas where sociolinguistic concepts, such as the principle of accountability or indeed a clear delineation of the participation framework, can support LL analysts in creating rigorous sampling and coding protocols. A further aim of our research is to highlight the benefits of geospatial analysis and visualization methods for the analysis of geosemiotic patterns.

Our mixed approach allows us to explore the factors that hinder or facilitate the public expression of indigenous linguistic identity, and indeed the implementation of the newly proposed Bill #85, in the RMI. Monolingual English signs dominate the LL of Majuro atoll; they are much more common than Marshallese signs or the bilingual signs advocated by the government. This is even the case for signs produced by the Marshallese government. While official governmental signs are closest to the language policy measure, overall, the signpostings by the RMI government do not yet reflect the proposed language policy (Dunlevy, 2012:65). A number of factors conspire to give the Marshallese language relatively scant exposure and thus make the implementation of the bill acutely challenging. Many signs, such as advertisements, shipping notices, and warning signs, but also the street furniture are manufactured elsewhere and then imported. The issue is compounded by the fact that the RMI is a very small island state and multinationals, such as shipping and trading companies, as well as non-governmental organizations providing aid, use English or other areal lingua francas on their signs. To date, the Marshallese have very little authority over the code choice on such signage unless they impose a strict language policy that legislates these monolingual signs as part of Bill #85.

One linguistic issue that will place the RMI language policy in a difficult situation is the fact that the Marshallese language lacks words for concepts such as vending machines, disposal sites or vendor licenses, or many non-indigenous food items such as rice, burgers, ice-cubes, betel nuts or turkey tails. In fact we were often not quite sure how to classify signs containing loanwords such as vendor licenses or cash-power electricity cards and our coding decisions rest on discussions with native speaker informants. Crucially, Bill #85 explicitly includes a corpus planning element, which relies on the training of official translators under the supervision of the Customary Law and Language Commission.

Furthermore, given the low achievement records of Marshallese school children in standardised English tests (Pine & Savage, 1989; MIJ, 2016), we need to question the extent to which the present LL of the RMI is even accessible to the Marshall Islanders. This is especially important since the choice to use English renders certain types of signs—and thus the dissemination of crucial information—non-inclusive (Rubdy, 2015). Consequently, notices about buried cables (Figure 1), volleyball tournaments or important public health messages are not accessible to many Marshallese, a direful case of "passive exclusion" (Thistlewaite & Sebba, 2015:27ff). On a more positive note, the recent language policy decisions suggest that this situation might be changing in the near future. By spearheading initiatives such as the recent Bill #85, the RMI is in the process of "making and shaping" its own linguistic landscape (Pennycook, 2009:308), and thus increasing the visibility of Marshallese in the semiotic ecology of the island state. Our combined methodology allows us to pinpoint the geospatial niches in which the Marshallese language is asserting itself against the global superlanguage English—as well as the sociodemographic factors that condition code distribution in the RMI. Such findings can inform the ongoing language management process in the island state.

Crucially, the language policy for the linguistic landscape we discuss in this paper is part of an ongoing movement towards cultural renewal and community empowerment, both of which buttress language revitalization efforts. Consider in this respect for example the Waan Aelõñ in Majel canoe building and sailing project (www.canoesmarshallislands.com), the community gardening work that is organized by the wellness center and under the Micronesian Land Grant project (2014), as well as the revitalization of the art of Jaki-ed weaving (Pacific Parts Association, 2012). Our research on the linguistic landscape should therefore be seen within the context of a larger movement towards cultural self-affirmation through language (Goffman, 1963), and thus within the whole *paysage linguistique* (Landry & Bourhis, 1997:23). Finally, the temporal element of our research gives us the opportunity to map the ongoing struggle for linguistic visibility in subsequent visits. We aim to trace the "diachronic process" of languaging in the RMI and to report back in about three years' time (Pavlenko, 2010:133).

Acknowledgements

We acknowledge the generous support of the German Research Foundation (DFG) and Northumbria University at Newcastle (UK). We would like to thank Kennedy Kaneko and Siyao Wang for translating the signs from Marshallese and Chinese. Thanks also to Karl

Fellenius, The Wellness Center team, Nik Willson, and Dr. Irene Taafaki for the many ways in which they helped us navigate the linguistic land- and seascapes in the RMI as well as adjust to life in the Marshalls in general.

Notes

[1] More recently, linguistic landscape research has increasingly broadened its remit towards the analysis of all kinds of symbolic practices such as, increasingly, non-textual visuals, images, and objects, as well as voices, music and olfaction. This approach is captured in Scollon and Scollon's (2003) concept of "semiotic landscape" (see also Jaworski & Thurlow, 2010). Our research considers geosemiotics in a more narrow sense: We explore language choices on textual signs in the Majuro urban conurbation.

[2] Le droit à la ville

[3] While they host some of the highest concentrations of inhabitants per square mile/km in the Pacific, the population is still very small by any standards. About 17,000 people live in the Majuro conurbation (EPPSO, 2012).

[4] For example, a taxi fare goes up from 25 cents to one dollar when crossing the bridge.

[5] Since VALLS is still in its infancy and has not yet developed rigorous standards of sampling, collection, and data coding, ongoing work aims to test the applicability and indeed the usefulness of variationist concepts such as the principle of accountability for LL research (see Blackwood 2015). We are therefore happy to comply with an anonymous reviewer's request to be maximally transparent about our methodological decisions, especially regarding the delimitation of our unit of analysis. One crucial question we need to address is that of scale. Our data contains all signs that were linguistically accessible to us—and thus to the non-linguist observer—without optical processing. We agreed to use the road as a geographical anchor and while we sometimes walked closer to buildings or into courtyards in order to get a better (i.e., less grainy) picture of the signs, we only included in our sample signs that were readable from the road and we never went around buildings. As a consequence of this methodological decision, the inclusion of an individual sign is dependent on both its size and distance to the road (i.e., we recorded smaller tags and lettering when they were close to the street). By the same token, items inside shop windows were only recorded if they were clearly readable when standing on the street in front of the shop. As such, our research fits into the growing field of linguistic steetscapes (Husband, Alam & Hüttermann, 2016). We hope that a detailed discussion of the methodological choices we took—while certainly contentious and not unanimously applicable—serves to make transparent the methodological choices that underpin our work.

[6] Since the attribution of a text to a specific language can be especially dubious for brand names, we discarded all signs containing only brands names from our analysis. Thus, a sign stating "Mitsubishi" was not included into our corpus whereas signs such as "Asahi draft beer super dry" or "Vaseline Soft & Smooth" were included.

[7] We used the term "emitter" in order to circumvent the often murky nature of the production format of these signs (Goffman, 1981:110), which tends to conflate authorship (i.e., the person who ratifies the words being used) versus the role of principal (i.e., the person whose position or sentiments are being established by the words, see Goffman, 1981:144). While we acknowledge that this is an undue simplification of the complexity of signposting in the RMI, at present we are unable to ascertain who, for example, makes decisions about the content, design, or code choice of signs posted by the RMI government or indeed by larger administrative bodies such as the World Health Organization. The overall point we would like to make in this paper is that, given the expressed wish of the RMI government to change code choice on public signage, what is needed at this point is consolidated information about (1) the emitter groups of public signs and (2) their signposting strategies. The issue of who is ultimately responsible for the wording and code choice on the signs posted by larger administrative and corporate bodies will be addressed in future policy strategy and is not part of the remit of our paper.

[8] See Tannen and Wallat (1986) for a good exemplification of continuous vs. discontinuous frames.

[9] We would like to thank an anonymous reviewer for pointing out that Goffman's definition of footing references an element of content/discourse, whereas Backhaus' analysis refers primarily to physical placement. Hence, while the epistemological underpinning of the concept 'frame' differs between these two approaches, our field site—and probably many other types of data—necessitates an approach that draws on both an interactional sociolinguistic definition *as well as* a spatial definition of frame (see Roeder & Walden, 2016).

[10] Land ownership in the RMI is complicated but the *wāto* is the basic administrative unit of landownership and land inheritance (see Barker, 2013). *Wātos* consist of strips traversing the land from the ocean to the lagoon side which traditionally permit cultivating the triad of food crops—breadfruit, coconut, and pandanus (see Buchstaller & Alvanides, forthcoming).

[11] Below, we will discuss two more types of signs where code choice is categorical.

[12] We initially also coded for handcrafted / artistic production but ended up excluding this category since it turned out to be difficult to operationalize.

[13] The table lists the levels of all factors (including their interaction effects) which condition the use of bilingual public signs. All glmer models include *wāto* as a random effect. Estimates for non-significant predictors are not shown. For the graphs, we have transformed the log-odds estimates into probabilities using the "effects" package in r (Chambers & Hastie, 1992).

[14] To further exemplify this point, the language educational policy reform proposed in summer 2015 aims to give more space to the Marshallese language as a medium of instruction. We take these facts to mean that the language management decisions taken by the RMI government aim to expand the use of the Marshallese language into more and more formal and technical domains.

https://doi.org/10.1017/jlg.2017.4 Published online by Cambridge University Press

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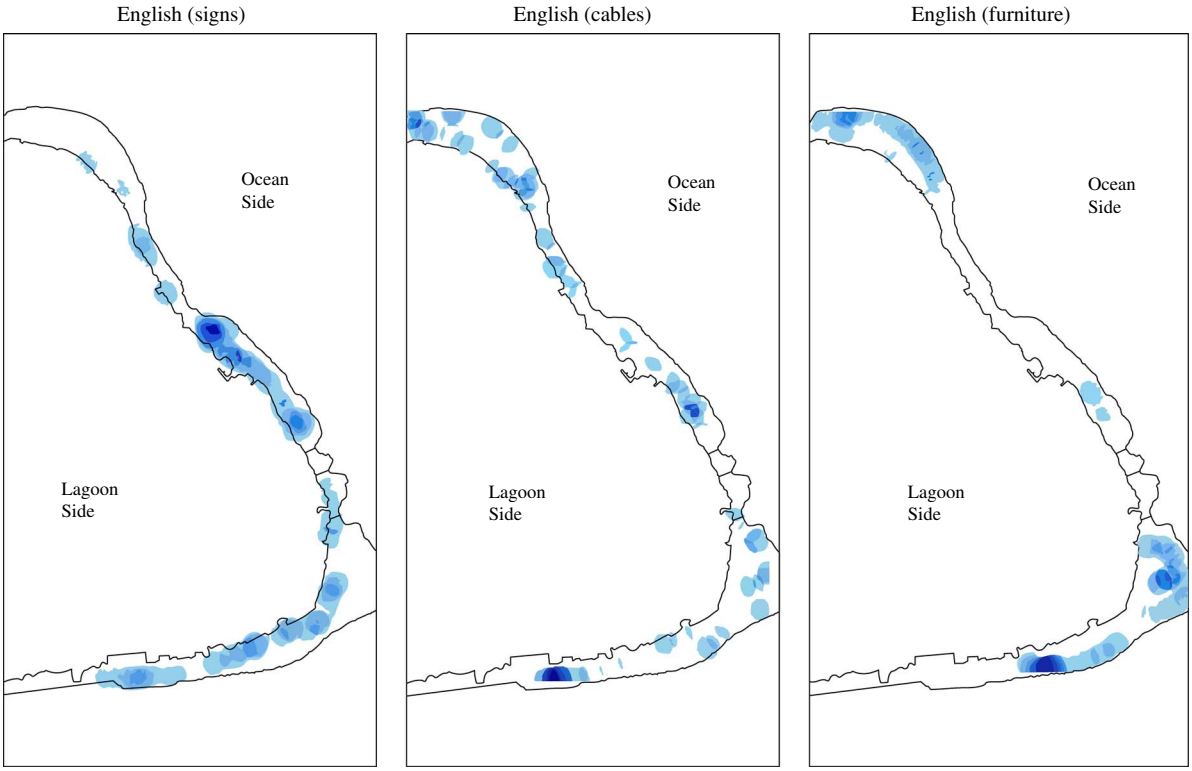
Appendix 1: Distribution of (variable) English signs, cables and street furniture.



https://doi.org/10.1017/jlg.2017.4 Published online by Cambridge University Press