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## Language Hotspots: what (applied) linguistics and education should do about language endangerment in the twenty-first century

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I outline the concept of *Language Hotspots*, seeking to direct public and professional awareness of the global language extinction crisis. The loss of a single language leaves the science of linguistics impoverished and yet even few linguists realize that the vast majority of *language families* will likely be lost by the end of this century. Language Hotspots can serve as a focal point around which to develop a comprehensive approach to addressing how to increase, improve and coordinate engagement by all stakeholders in the global language extinction crisis, not only linguists and the communities undergoing language shift themselves, but also applied linguists, the general public and educators at all levels. I briefly outline language endangerment and its causes and detail the science behind the global Language Hotspots list, and then turn to an exemplification of an area of extreme linguistic endangerment, the Eastern Siberia Language Hotspot. Finally, I make a plea for linguistic scientists to increase their efforts in language documentation and for language education specialists to use their considerable skills and expertise to help support Indigenous movements in language revitalization. I then offer thoughts on why the Language Hotspots model should be incorporated into primary-, secondary- and postsecondary-level curricula.

**Keywords:** language endangerment; endangered languages; language shift; language revitalization; language documentation; applied linguistics

### Introduction

It has become almost a popular adage that every fortnight – on average – an elder dies who is the last speaker of a language somewhere in the world.<sup>1</sup> When this person passes on, he or she takes with him/her a storehouse of the history, legends, riddles, songs and even the thoughts and experiences of an entire culture. Indeed, the so-called ‘endangered languages’ – ones that no longer have new generations acquiring them and whose community of speakers have begun shifting to other more socially dominant languages – offer challenging data for the field of linguistics, indeed often inform theoretical advancements, or would if more linguists cared about them. To be sure, it is hardly hyperbole to say that the loss of a single language leaves the science of linguistics impoverished and yet even few linguists – and a miniscule portion of the general public – realize that the vast majority of *language families* will likely be lost by the end of this century.

As true and unfortunate as that prospect is, language endangerment and language extinction entail more than just the loss of the object of study of the remote and largely

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esoteric field of linguistics. Communities undergoing language shift embody and experience a broad spectrum of humanistic and social issues. In this paper, I outline the concept of *Language Hotspots* that contextualizes and seeks to direct public and professional awareness and appreciation of the global language extinction crisis. The concept of Language Hotspots can serve as a focal point around which to develop a comprehensive approach to addressing how to increase, improve and coordinate engagement by all stakeholders in the global language extinction crisis, not only linguists and the communities undergoing language shift themselves, but also university-based applied linguists, the general public and educators at all levels (e.g. in primary and secondary schools).

In the following sections, I briefly outline language endangerment and its causes and detail the science behind the global Language Hotspots list. I then turn to an exemplification of an area of extreme linguistic endangerment, the Eastern Siberia Language Hotspot. Finally, I make a plea for linguistic scientists to increase their efforts in language documentation and for language education specialists to use their considerable skills and expertise to help support Indigenous movements in language revitalization, and then I offer thoughts on why the Language Hotspots model should be incorporated into primary-, secondary- and postsecondary-level curricula.

### **Language endangerment and language shift**

A language has begun to be endangered when there has been a disruption in the intergenerational transmission of the language, i.e. when children are not learning a heritage language as a first language or at some point reject the use of the heritage language. This generally manifests itself in one of two ways. One scenario entails semifluent or fluent bilingual parental generations not speaking to their children in the heritage language. In this context, the functional domain of the heritage language has been narrowed to no longer include even the domestic interactions of parents and young children. In the second common scenario, the youngest children acquire the language at home through the natural process of intergenerational transmission and acquisition, but the children rapidly reject the use of the heritage language when they have entered the domains of national schooling and national, urban/metropolitan, transnational or globalized culture. This is due to a complex set of social evaluations that the schoolchildren engage in, but it is not too much of a simplification to state that this is largely triggered by the particular sensitivity of school-age children and adolescents to the valorization of the socially dominant majority language and the consequent devaluing of the traditional minority or heritage language in the market of social capital (Heller 1987).<sup>2</sup> These school-age children are engaged in what effectively is seen as a zero-sum game: only one language can win. Once this decision has been made by children in the speech community to reject the heritage linguistic identity in favor of the socioculturally dominant one, the path to language extinction can only in rare instances be reversed or altered, and if so, only with tremendous society-wide effort. This is mainly due to the socioecological factors of language endangerment. In other words, once endangered, languages gradually further narrow their functional domains and lose their speaker base, which is not renewed as is the case with 'healthy' or stable languages. Eventually, the heritage language stops being used altogether by all but the oldest members of the community. In time, the last few speakers of such terminal-phase or moribund languages pass on and the language is lost altogether, thus the process of shift to the socially dominant language(s) is complete. Languages undergoing such narrowing of functions or shift generally follow a path of healthy > threatened > endangered > seriously

endangered > moribund > extinct; compare similar hierarchies used by Kinkade (1991), Wurm (1991) and Krauss (1992) among others.

Language endangerment is a complicated sociocultural phenomenon, but in essence is triggered by a conflict between language ideologies in a community where two or more languages are in contact and compete for functional domains of use. A *language ideology* (Irvine and Gal 2000; Makihara and Schieffelin 2007; Winford 2003a; Woolard 1998) reflects a complex set of attitudes by a speech community toward the language it uses. These varied attitudes include notions about the relative degree of expressive flexibility that the language exhibits, whether it can tolerate another language competing in any context or functional domain, or whether it is a language associated with economic gain/upward mobility, ideals of power, prestige, etc., or not. In particular, language shift is often associated with a language ideology that accords one dominant language primacy in the speech community and devalues multilingualism – a subtractive ideology or an ideology of dominance (cf. Silverstein's [1996a] *linguistic hegemony*). In other words, this ideology sees the 'linguistic market' (Bourdieu 1991) as a zero-sum game, necessitating the replacement of all nonvalorized languages with the dominant ones. Therefore, the social ecology of languages in contact is primary in determining the type and nature of not only the likelihood of language shift (Gal 1979), but also the structural outcomes of language contact (Anderson 2005; Brenzinger 1997; Calvet 2006; Labov 2001; Martin-Jones 1989; Mufwene 2001, 2008; Mühlhäusler 1996; Sankoff 2001; Silverstein 1996b; Thomason 2001; Thomason and Kaufman 1988; Winford 2003b; Woolard 1989). This loss of knowledge that the global language extinction crisis entails will indeed be catastrophic for all of humanity; see Harrison (2007) and Evans (2010) for two recent and eloquent demonstrations and exemplifications of this loss.

### Language Hotspots

The languages of the world are not evenly distributed across the globe and neither is linguistic diversity. Importantly, certain areas have more different kinds of languages than others. These two factors (distribution of total languages and distribution of linguistic diversity) are independent.<sup>3</sup> Furthermore, the particularly aggressive linguistic ideology that requires the replacement of local (often but not exclusively minority) linguistic identities with translocal, national or international ones has also not been spread evenly around the world. Given these facts, it should not come as a surprise that the distribution of language endangerment and processes of language shift are likewise not evenly spread across the languages or regions of the world. Rather they unevenly cluster in certain areas due to the uneven spread of the sociocultural conditions that favor such shift.<sup>4</sup> Unfortunately, only a small fraction of the world's languages have been properly described, and many languages will likely lose their last speakers before they can be adequately documented at all.<sup>5</sup> There are thus simply too many poorly documented threatened languages and too few linguists and too little potential funding for every language in the world to be adequately documented unless the amount of qualified personnel and funding both become augmented considerably in the near future. Of course, every language, big or small, dominant or endangered, has the same potential value to its community of speakers as an emblem of ethnic identity and as a storehouse of the history of their community. For many communities, their language is the only such record. That being said, the reality of present circumstances is such that not every language is going to be adequately documented and priorities need to be established. These factors were taken into consideration when identifying the priority areas called the Language Hotspots.

As alluded to earlier, the estimate that roughly half the world's languages will become extinct in the twenty-first century is almost unquestioned by contemporary linguists. However, it is not widely understood just how catastrophic this loss will be for linguistic diversity, and therefore for the entire endeavor of professional linguistics. Nor has there been the rush to documentation by field linguists that this situation necessitates. Most of the different types of the world's languages are included in the half that are threatened or endangered. Thus, linguistics is facing an enormous task of documenting languages before it becomes impossible to do so, and modern linguists owe to the future of the discipline and to the posterity of all of humanity the best effort to document what remains of linguistic diversity before it is too late. The issue is overwhelming and the numbers staggering, so a concerted and focused effort is required. The reality is that there is a finite amount of time, a finite amount of money and a finite pool of potential field linguists that have the ability or likelihood to ever play a role in endangered language documentation. Also, while many linguists are aware of the issue, far too few of them act in response, and despite two decades of effort, the general public has remained largely uninformed and uncaring about the looming global language extinction crisis. So I felt that it was critical for the discipline of linguistics to develop a 'marketing tool' to 'brand' the concept of language endangerment. Such a marketing tool could be used as a means of recruiting new people into the field and to attempt to mobilize and increase public support. At the same time, as a scientific discipline linguistics itself needs a focal point for pursuing concentrated documentary efforts on a global level in order to have the maximal needed impact for the field and for humanity as a whole. Thus was born the global Language Hotspots list, which was first described and identified by Anderson and Harrison (2006), first published by the Living Tongues Institute for Endangered Languages in 2007 ([www.languagehotspots.org](http://www.languagehotspots.org)); the Language Hotspots map first appeared in the popular media with a selected subset of Hotspots in National Geographic magazine in October 2007; see Figures 1 and 2.

The Language Hotspots list also functions as a promotional metaphor to contextualize the global language extinction crisis and package it for public consumption. The hotspot metaphor was chosen for this as a public promotional branding device due to its success in the biodiversity conservation movement (cf. [biodiversityhotspots.org/xp/hotspots](http://biodiversityhotspots.org/xp/hotspots)).



Figure 1. Language Hotspots map volume 1.0 (National Geographic, October 2007). Map used with permission of the Living Tongues Institute for Endangered Languages.

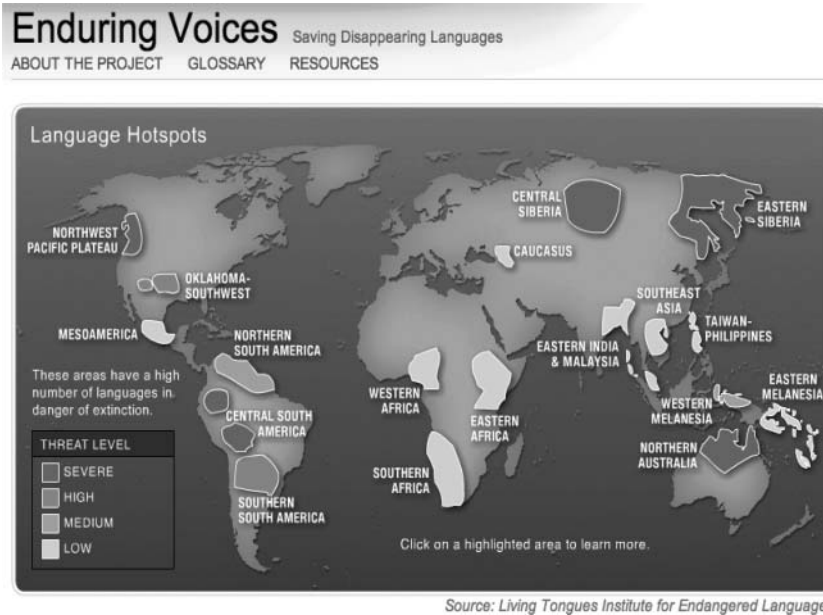


Figure 2. Language Hotspots map 1.1 (National Geographic Enduring Voices Web site). Map used with permission of the Living Tongues Institute for Endangered Languages.

Therefore, the Language Hotspots list should be understood not only as a means of raising public awareness and to help fix the idea about the global language extinction crisis in a relatively easily digestible format, but also as a guideline or 'road map' for professional work in documentary linguistics in the twenty-first century. Simply put, Language Hotspots are where the majority of the human and financial resources of linguistics must focus in the coming decades.

The global Language Hotspot list is the result of years of research. Language Hotspots are found where there are concentrations of diverse, endangered and poorly documented languages. They are arrived at by overlaying maps of three quantitatively supported but logically independent parameters. These are: (1) the density of language family diversity, (2) the overall level of endangerment, and (3) the overall level of documentation. Thus, for a specific hotspot area (or language within it), we may speak of a *genetic index*, an *endangerment index* and a *documentation index*.

The endangerment index is arrived at by assigning to every language a numerical value on a five-point scale, where '5' represents 'healthy' and 1 represents 'moribund' (and 0 'already extinct'). Roughly speaking, this number correlates with the age of the average speaker of the language: if the average age of the youngest speaker is between 40 and 60, the language is 'seriously endangered' (2 on the scale), if between 60 and 80, it is 'moribund' (1 on the scale), etc.

The documentation index also references a five-point scale, where 5 represents an idealized 'complete' documentation with full sets of grammatical and lexical materials and annotated text collections, multimedia annotated digital audio and video corpora, etc., and 0 represents a completely undocumented language.

The genetic index is reckoned for the hotspot as a whole by dividing the number of genetic units represented by the total number of languages.<sup>6</sup> 'Genetic unit' here is

understood to be a taxonomic level of relatedness akin to that typified by the Germanic or Romance family. This level of classification remains both easily comparable across the globe and straightforwardly demonstrable and uncontroversial, while broader classifications frequently entail not insignificant controversy among specialists and/or are supported by more tenuous data.<sup>7</sup>

The classification of African languages offers a telling example of how low-level relationships reflected in the genetic unit are uncontroversial, but higher-level groupings are contentiously debated by specialists. For example, while Greenberg's (1966) classification of African languages into four macrophyla is still found in many textbooks on linguistics, encyclopedias or general education resources, virtually no specialists now consider Greenberg's Khoisan phylum as a viable taxonomic unit at all. Rather they consider the secure low-level units of Khoe, Tuu, Ju, Hadza and Sandawe as valid<sup>8</sup>; see Dimmendaal (2008) and Sands (2009) for more on the emerging consensus on the classification of African languages. Within the Language Hotspots model, former 'Khoisan' would be considered to reflect the five genetic units listed above: the three genetic units Khoe, Tuu and Ju being found in the Southern Africa Language Hotspot and the remaining two genetic units Sandawe and Hadza in the Eastern Africa Language Hotspot.

Language Hotspots emerge where there are concentrations of languages with a high average endangerment index, a low average documentation index and an overall high genetic (diversity) index. Roughly 20 such Language Hotspot areas are found across the globe. Within these, the overall degrees of threat can be ranked from moderate to very high. Hotspots can be found in such a diverse array of places as Northern (and West-Central) Australia, Western North America, the Southern Cone, Southern Africa, Oklahoma, Eastern Melanesia, the Caucasus, Central South America, (Interior) Southeast Asia, (North) Eastern Africa, Northern South America, Peripheral (Greater) South Asia (originally called Eastern India and Malaysia), Taiwan and (Northern) Philippines, Southern South America, Central Siberia, West(-Central) Africa, Mesoamerica, Western Melanesia and Eastern Siberia.<sup>9</sup> I will discuss one such Language Hotspot, the case of Eastern Siberia, in greater detail in the next section, exemplifying how the genetic, documentation and endangerment indices are reckoned for this Language Hotspot.

### **The Eastern Siberia Language Hotspot**

The peoples of the large Eastern Siberia Language Hotspot primarily live in isolated rural communities and many continue to practice modified traditional subsistence economic pursuits. Along the Amur River and in the coastal areas of Sakhalin Island, people live in small fishing villages and mainly pursue a traditional lifestyle based on subsistence fishing. In the rugged, mountainous, interior northeastern parts of the region that encompasses the famed Kamchatka Peninsula (as well as in noncoastal parts of the southeast and Sakhalin), the Indigenous Siberian populations have practiced a mixed hunting and reindeer-herding economy. On the northeastern coasts, sea mammal hunting continues to dominate local subsistence economic practices. Throughout the Eastern Siberia Language Hotspot, various people are also employed in petrochemical and mining concerns, commercial fishing and logging pursuits, and a significant percentage of the people in the Language Hotspot now dwell in cities as well.

In the early seventeenth century, Cossacks first penetrated into Eastern Siberia and established exploitation colonies for the purpose of collecting the Imperial fur tribute, the dreaded and onerous *yasak*. As long as payment of the *yasak* was met without resistance, the Native Siberians were mostly left alone (Diment and Slezkine 1993;



Forsyth 1992). Therefore, in Eastern Siberia, the Indigenous languages and cultures were maintained largely intact during the first two centuries of Russian rule. Later, during the initial phase of the penal colony that Siberia is infamous for, smallpox (and influenza) lent a helping hand in subjugating the Siberian peoples. For example, the Yukaghir were literally decimated by the disease. In the mid-to-late nineteenth century, the freed population of former serfs began occupying various areas across Siberia. Later, massive multinational Russian-speaking populations were forcibly moved or lured there in the early Soviet period (Armstrong 1965; Stephan 1994). It was largely not the Imperial Russian, but rather mainly the Soviet settlement (and penal) colonies that triggered the process of language shift in local Indigenous communities across Eastern Siberia (Bartels and Bartels 1995; Kerttula 2000; Vakhtin 1992). This process is still ongoing for some and complete for others.

Given the overall small total number of languages that are found in Eastern Siberia, such an area is usually overlooked when prioritizing areas of the world or looking for areas with concentrations of linguistic diversity. However, there is in fact an extremely high level of unique phylogenetic linguistic diversity endemic to the region. Twenty-one languages representing nine extant language families/genetic units are found in the Eastern Siberia Language Hotspot. In fact, four genetic units occur only in the Eastern Siberia Language Hotspot; this includes two language isolates, Yukaghir and Nivkh, plus Itel'menic and Northern Chukotko-Kamchatkan, in addition to the genetically unclassifiable mixed language Mednyj Aleut. One other family, Tungusic, also occurs primarily in Eastern Siberia (also being found in adjacent parts of northern China). The other genetic units are found in both Eastern Siberia and adjacent regions as well. This includes Turkic, Aleut and Eskimoic. Almost all of the languages of the Eastern Siberia Language Hotspots are endangered (really only Sakha, aka Yakut is not), and many of them are seriously endangered (endangerment index of 2) or are moribund (endangerment index of 1). Some languages formerly spoken in the Eastern Siberia Language Hotspot are unfortunately now extinct: Omok, Chuvan, Sirenik, Sakhalin Ainu and probably by now also Kerek (see Table 1).

As mentioned earlier, in Eastern Siberia, there are 21 living Indigenous languages; 20 are threatened or endangered, as are all but one of the remaining nine genetic units. A further four genetic units of Eastern Siberia have no remaining speakers, namely Ainu<sup>†</sup>, Sirenik<sup>†</sup>, Omok<sup>†</sup> and Chuvan<sup>†</sup>; Yukaghir, Itelmen, Mednyj Aleut and Nivx will likely soon follow them. The genetic index of Eastern Siberia thus remains very high, .429, but this is down from an original .52 with the extinction of four genetic units in the area.

The average level of endangerment is very high, 1.93 (remember that 0 is extinct, 5 is healthy). In other words, the average language in the Eastern Siberia Language Hotspot is seriously endangered to moribund, with the average youngest speaker being 50–60 years old or older. According to data of the 2002 Census of Russia (<http://www.perepis2002.ru/>), all languages except Aleut, Oroch, Yakut and Yukaghir reported a decrease in the total number of speakers, but of these only Yakut likely reflects an actual rise in the number of speakers, as Yakut is absorbing other languages of Northeast Siberia, e.g., Even. The socially dominant Russian language is also expanding almost everywhere at the expense of the Indigenous languages except in the Sakha Republic where Yakut/Sakha is the dominant language still, though in urban areas such as Yakutsk Russian remains dominant. The most catastrophic decline has been seen among the Chukchi, Oroch, Kerek, Ulch, Koryak, Nivx, Oroch, Evenki and Eskimo. Officially speaking, Oroch is down to 64, Kerek to 15, Al'utor to 40 and Negidal to 147. This is very grim indeed, considering that Russian census numbers for speakers of Siberian languages are frequently inflated due to the practice of asking respondents to self-identify their mother tongue, answers to which often reflect ancestral

Table 1. Languages of the Eastern Siberia Language Hotspot.

Language	Genetic unit	Endangerment index	Speakers	Population	Documentation index
Ainu <sup>†</sup>	Isolate	0	?0	?0	3
Aleut	Aleut	2	190	702	3
Alutor	Chukotko-Kamchatkan	2.5	100–200	2000	2
Chukchi	Chukotko-Kamchatkan	3	10,000	15,000	2
Chuvan <sup>†</sup>	Chuvanic	0	?0	?0	0.5
Even	Tungusic	2.5	7543	17,199	1.5
Evenki	Tungusic	2	5000	30,000	1.5
Itelmen	Itelmenic	1	60	2481	4
Kerek <sup>†</sup>	Chukotko-Kamchatkan	1	?2	400	1.5
Kolyma Yukaghir	Yukaghiric	1	10–50	130	3
Koryak	Chukotko-Kamchatkan	3	3500	7000	2.5
Mednyj Aleut	Mixed Language Aleut-Russian	1	10	10	1
Nanai	Tungusic	3	5760	11,877	2
Negidal	Tungusic	2.5	100–170	500	1
Nivkh	Isolate	1.5	400	4673	2
Oroch	Tungusic	1	100–150	900	1
Orok	Tungusic	1.5	30–82	250–300	1
Tundra Yukaghir	Yukaghiric	1	30–150	230–1100	3
Udihe	Tungusic	1	100	1600	3
Ulch	Tungusic	2	500–1000	3200	1
Yakut	Turkic	5	363,000	382,000	4
Yupik, Naukan	Eskimoic	1	75	350	1.5
Yupik, Siberian	Eskimoic	2	300	1200–1500	4

<sup>†</sup>The language is extinct or probably extinct.

heritage/allegiance and identity, which can be quite strong, rather than actual linguistic competence or usage, which is usually conversely quite weak.

The average levels of documentation of the languages of the Eastern Siberia Language Hotspot range between 1.78 and 2.12 (0 is lowest and 5 is highest; see Appendix 1 for a sample list of documentation). This depends on whether extinct languages are included. Despite a range of recent and welcome works coming from Japanese scholars, often in collaboration with Russian scholars (e.g. Kazama 2003; Miyaoka and Endo 2004), an enormous amount remains to be done in language documentation in Eastern Siberia, and also for supporting and developing Indigenous programs for language maintenance and revitalization in this region.

### **A call for a comprehensive approach to language endangerment**

Language Hotspots are distributed across the globe and therefore the appeal of the model should be universal. Also, the concept has a thorough and solid scientific basis. It is thus ideally suited to help focus efforts from a range of stakeholders with very different orientations and individual roles to play in a comprehensive strategy addressing the (epi-) phenomena of language endangerment, language shift and language extinction. These stakeholders include the following (nonexhaustive) list: traditional academic field linguists, applied linguists, educators at all preuniversity levels, members of the general public and

members of the speech communities experiencing shift. What follows can be considered a call to action for these stakeholders.

The traditional academic field linguist is a trained scholar who collects primary language data in conjunction with a (usually) native-speaking consultant/teacher and then analyzes and disseminates these data to a scholarly or academic audience. These primary data presentations constitute the bread and butter of such disciplines as linguistic typology, language universals and much of theoretical linguistics. Without primary data collection and analysis, much of linguistics would be impossible. Indeed, it is without question that based on the smaller empirical database that the mass global extinction of languages entails, it is more likely that incorrect generalizations will be reached, and we will never really, truly understand what limits and possibilities might have once constrained or shaped language – this most human of socially mediated constructs.

The documentation of endangered languages must become the primary focus of the field of linguistics in the coming decades before it is too late. There are limited resources for endangered language research, both financial and human, and, for many languages, a limited amount of time as well. Nearly two decades have passed since concern by an ever-growing group of linguists about the global language extinction crisis reawakened interest, but there has, as of yet, been relatively little increase in the necessary resources or qualified personnel, nor has there been much increase in associated public energy or engagement with the issue. Therefore, the Living Tongues Institute for Endangered Languages felt that it was time to ‘brand’ the issue of language endangerment to make it more palatable for professional linguistics, other academic and popular consumption by introducing the global Language Hotspots list. Through collaboration with National Geographic Society Missions Programs, the Living Tongues Institute created the Enduring Voices Project in part as a vehicle to raise public awareness about the global language extinction crisis through the promotional metaphor of the Language Hotspots, thereby disseminating this message to the widest possible multimedia public audience that this partnership affords.

The Language Hotspots thus represent priority areas where these documentation efforts should concentrate. Within each Language Hotspot, priority languages have been identified. These priority languages take into consideration the various relevant numerical indices relating to language endangerment, taxonomic classification and documentation. Linguists must not shy away from languages that are experiencing shift at a rapid rate, nor ones in which there are very few or no remaining fluent first language speakers. Linguists themselves often shun such languages or situations, in search of an idealized ‘pure’ linguistic system without interference and stripped of its historical or contemporary contextual dynamics. In fact, if a language is identified as a critical priority language, even if it is moribund or severely endangered, and even if only a partial salvage documentation is possible, it should still garner attention, all the sooner since time is working against the task. Language Hotspots can serve as a road map to the future of language documentation – an increasingly important subdiscipline within linguistics. I argue quite simply that this *must* become the primary focus of the field of linguistics and there should no longer be a distinction between linguists who do field work (‘field linguists’) and those who do not, or at least not for those younger linguists entering PhD programs now. Theoretical linguistics must be the domain of those who have already made their contribution to primary language documentation and who are experienced enough to focus on other subfields.

Generating new speakers and supporting the ones that already exist, as well as maximizing the efficiency and effect of instruction are the frequent goals one hears from communities facing language shift. Getting kids and teenagers engaged is a common procedural or logistical hurdle that many communities undergoing language shift must overcome. The process

of implementing a strategy to generate new speakers, to bring back some domains of use of the ancestral language or to find new functional domains in order to keep it active, relevant or contemporary through community-driven efforts is called *language revitalization* or *language maintenance* (Grenoble and Whaley 2006; Hinton and Hale 2001; Hinton, Vera, and Steele 2002).

It is unfortunately true that academic (field and theoretical) linguists have little to offer in the way of expertise to communities when it comes to the very things that the communities state they want and need the most: for example, help in constructing or furthering language revitalization or maintenance programs and in the development of school curricula for various ages. Communities also often would like to be able to instruct children and/or adults in their ancestral tongue(s), but the implementation of best practice in second language instruction and culturally mediated or otherwise appropriate pedagogies is often not possible with input coming only from academic linguists (see also Penfield and Tucker 2011).

While inherently a grassroots process on the community level that must respond to community directives and community needs, revitalization program coordinators and activists often desire the assistance of a linguist. If assistance is needed in language documentation, including the collection and creation of grammatical materials, but especially dictionaries or lexica and text collections, then an academic linguist is an appropriate project team member or consultant. If, on the other hand, the community needs assistance in developing pedagogical materials, primers, primary, middle or secondary school curricula, etc., or help with implementing or strategizing about the development of immersion schools, language nests and the other types of institutional infrastructure, then applied linguists and/or other language education specialists are needed.

Despite this obvious need for applied linguists in language revitalization projects – and thus ultimately in most projects addressing endangered languages and their speaker communities – there remains a major disconnect between the traditional academic linguists who often engage these communities and the applied linguists whose expertise is invaluable in any such project. So disparate are these worlds that only one of us Linguistic Society of America (LSA) member field linguists who are endangered language specialists and who participated in the panel on Language Endangerment at the American Association for Applied Linguistics (AAAL) meeting in Atlanta in March 2010 knew more than a handful of the thousands of colleagues attending this meeting outside of this panel. It is as if applied (AAAL) linguists and nonapplied (LSA) linguists occupy entirely separate planes of existence. Rather than complementing each other and developing fruitful collaborations with respect to the endangered language revitalization movement, project teams rarely include both traditional academic linguists and applied linguists. This must change. The ever-growing endangered language revitalization movement quite simply needs the expertise of applied linguists and other second language education specialists and their insights.

No two communities will have the same needs and goals for their revitalization and maintenance programs, even if they are in roughly similar stages of shift, but, of course, neither does the wheel have to be reinvented anew for each situation. Some communities have specific and reachable goals of creating a new generation of speakers. To date, the most successful model to attain this goal has been the immersion school.<sup>10</sup> Immersion schools are, unfortunately, not always viable, nor are they always desired. Some communities may only want to restore stylized or symbolic use of the ancestral language, while others might aggressively seek new domains of use. Also, the goals and expectations of a community experiencing language shift may change over time with respect to the community's language revitalization or maintenance program(s). Programs must acknowledge and accommodate for these variables.

For example, grassroots revitalization efforts are underway in a number of Oregon's native communities, even the ones that have no fluent speakers of the heritage language remaining, e.g. the Confederated Tribes of Siletz Indians, located in the Western North America Language Hotspot. The Siletz have begun a language program through a charter school in Siletz, Oregon. Funded through a grant from the Association for Native Americans, the school program in Siletz Dee-Ni language brings to the younger members of the community a chance to gain fluency in their heritage tongue. This curriculum supplements the tireless activities of the cultural department head, Mr. Bud Lane, who has spent the past few years crisscrossing the state to hold adult language classes in many locations including Siletz, Portland, Eugene and Salem. It is ironic, but nevertheless important for the continued development of the program, that Siletz Dee-Ni instruction has qualified for the school district's foreign language curriculum requirement.

Matugar is a village on the North Coast Road up from Madang town in Madang Province, Papua New Guinea. Mr. Rudolf Raward is a passionate advocate for his Panau language that is spoken only in two small villages in the Eastern Melanesia Language Hotspot, and only by a dwindling percentage of the people, by perhaps around 450 residents. Following a preliminary visit to set up the project, Living Tongues Institute sent Institute Fellow Danielle Barth to live in Matugar and assist Mr. Raward and his family in their efforts to maintain and revitalize the Panau tongue. Mr. Raward also took part in a National Geographic Society Missions Programs' Enduring Voices Project Language Revitalization Technology Training Workshop at which he learned to produce the first book and first digital storybook in his language, in April 2010, authored by himself; he has subsequently produced several short documentaries on life in Matugar in both Panau and English. The next phase of the project will see the creation of multimedia teaching materials for the school in Matugar village.

The development of curricular materials and the application of best practice in second language pedagogy and new horizons in teaching and learning methodologies or culturally mediated or appropriate pedagogies are the areas where applied linguists and education specialists have significantly more to offer to Indigenous language communities experiencing language shift than do most typical field linguists. In certain parts of the world, but not typically in the USA, Canada, East Asia or Europe, linguists seamlessly switch between these roles. Although in many communities, this is an expected set of skills for a linguist and one of the primary reasons why outside professional assistance might have been perceived as a necessity in the first place, it is one that the traditional academic linguist is not likely to have. Bridging the gap between linguistics in its academic manifestations pursued by 'LSA-linguists' and its application to the needs of endangered speech communities is something that 'AAAL-linguists' and language education specialists must bring to the table so that constructive, collaborative teamwork can be done where all stakeholders and agents play contributing roles in a holistic approach to the documentation and revitalization of endangered languages (Penfield and Tucker 2011).

One area where we see a 'harmonic convergence' of efforts and skills is in the application of new technologies to the creation of tools that serve a dual purpose as a documentation and revitalization resource. One particularly useful tool of this sort is a *Talking Dictionary*. These are multimedia online resources that include text, sound files, photos and video functioning almost as an interactive, virtual, cultural encyclopedia for the speech community (or scholar). They are fun and easy to use and are equally accessible to adult and school-age learners alike. The Living Tongues Institute for Endangered Languages is a leader in the development of such online resources for endangered language communities. Currently, Living Tongues Institute has developed Talking Dictionaries for Tuvan in Siberia, for Ho of Jharkhand and Orissa States, India, for the Panau and the Panim languages of Madang Province, Papua New Guinea<sup>11</sup> and lastly one for the Siletz of Oregon. We also currently

have ones under development for the Sora, Remo and Gta' languages of Orissa State, India, and for Chamacoco (Yshyr) of Paraguay.

Minimally, a Talking Dictionary consists of text rendered in an accepted orthography linked to a sound file of that word/phrase. To use it, one simply clicks on the word/phrase and hears how it is pronounced. More than one speaker or more than one variant of a single word can be heard and accessed. Talking Dictionaries can be fully multimedia, with accompanying photo, video, audio and/or have text in multiple languages/scripts. Talking dictionaries are set to become a premiere online resource and tool for endangered language promotion and pedagogy in communities with e-access. Users report that the ability of the Talking Dictionaries to be used remotely in learning is convenient and engaging and the ability for one word or expression to be listened to repeatedly for practice is another welcome feature. Talking Dictionaries are also perpetually updatable so that they never become outmoded and are infinitely expandable. Talking Dictionaries can also be produced relatively quickly and at modest cost. The Siletz Talking Dictionary was password protected until 2011 and open only to enrolled tribal members, which is another possible feature of Talking Dictionaries that some communities desire.

Involving community members of all ages in the process of developing tools such as Talking Dictionaries offers transferrable skills and builds capacity in the community, thus raising comfort with (and training in) technology and with how to manage and oversee digital work flow. Furthermore, by providing training in technology and accommodating young people's natural inclination to engagement with 'digital literacies' (Snyder and Prinsloo 2007), communities undergoing language shift can try to incentivize participation by the many different demographic groups who are stakeholders in endangered language communities. In revitalization programs, the importance of transgenerational learning is clear, and today this often includes the reciprocal exchange of cultural knowledge with that of technological or other digital literacies (see Kenner et al. 2008), combined with communal colearning.

As mentioned earlier, school-aged children and adolescents in particular are extremely sensitive to peer perceptions and also hold the key to the vitality of the future of the language in the community. Some youth in endangered language communities themselves spearhead the quest for new functional domains for the heritage tongue. In the village of Palizi, Arunachal Pradesh, in the Himalayan foothills of northeastern India, Aka youth who speak the Hruso language of the Tibeto-Burman family acknowledge that many of their peers prefer Hindi now and some do not speak the language at all. Two teenagers have developed an Hruso-language hip-hop song celebrating the connection of hot peppers and sexual prowess. The song is wildly popular among all age groups in the village and is subtly sending the message to those who hear it that Hruso is a language with a foothold in the twenty-first century.

To be sure, vernacular education programs represent a highly contentious arena with respect to threatened, endangered or otherwise devalued speech varieties, e.g. creoles and 'minority dialects' (cf. Pollard 2002; Rickford, Sweetland, and Rickford 2004; Siegel 1996, 1999, 2007). Vernacular language education is nevertheless a frequently stated goal for communities experiencing language shift. The debate over vernacular language education for threatened and endangered or minority languages in Papua New Guinea has in part played out in the pages of this very journal (e.g. Klaus 2003; Nagai and Lister 2003, 2004; Pickford 2008; Skutnabb-Kangas 2003; cf. also Kulick 1992; Pickford 2005; Ray 1996; Wiruk 2000). Insights gained from these kinds of informed debates underscore the need for teams employing the coordinated expertise of different kinds of linguistic and educational specialists in the language revitalization and maintenance process worldwide.

The roles that need to be played by field linguists in language documentation and applied linguists, language education specialists and various groups of community member stakeholders are thus relatively straightforward. But some might ask, what are the roles of the public and general educators in these endeavors? To answer, one must appreciate the role of wider public attitudes in shaping the social forces that trigger language shift in Indigenous minority speech communities.

As I mentioned earlier, languages become endangered when there is a conflict between the ideologies associated with two (or more) languages in contact in a multilingual or bilingual population. Speakers of the dominant language do not permit other languages to compete for functional domains, and thus this necessitates abandoning other languages in the speech community. The issues involved in this are, of course, complex and multifaceted but it comes down to a basic intolerance to linguistic variation within the community. Attitudes of inherent superiority are not easy to erase from a population, but such views of linguistic hegemony can become even more marginal or socially unacceptable in an increasingly tolerant world through education, as have racist and sexist hegemonies in much (but not all) of the globalized transnational world of today.

The issues of language endangerment and language extinction need to be woven into social studies, geography and humanities/general educational courses at all pregraduate educational levels from K-12 up through undergraduate curricula. The phenomenon of language endangerment can contextualize a range of contemporary social issues such as globalization, tradition and modernity, colonialism, policy-making, diversity and human rights that can be pitched at appropriate levels and made meaningful to students of all ages in different ways.

I say this with only anecdotal personal evidence in support, but I am confident that future policy-makers, linguists and educators will profit from developing sustained awareness and appreciation for the beauty, complexity and humanness of language in all its diversity, and the importance of action in response to the grave threat the future of linguistic diversity faces. I have presented tailored information about the global language extinction crisis to educational audiences, ranging from a third-grade class in Oregon about the lost languages of Oregon to more general talks on language endangerment to middle and high school student audiences in various locales, as well as talks on the science of the Language Hotspots to college and university students at such places as the University of Oklahoma, Oberlin College and the University of New Mexico. Indeed, I have never once managed to answer all the questions that were asked in the allotted time, so I know the topic strikes a chord with young people of all ages. For postprimary students, I have frequently and successfully introduced the topic of language endangerment through screening of the Ironbound Films presentation *The Linguists* that has led to stimulating discussion with the students following its viewing. Knowing that there is a right medium and there are correct tools for conveying meaningful parts of the big picture, I am sure that a comprehensive program could be developed appropriate to every curricular level. It is critical that ways of developing units or modules on language endangerment and the global language extinction crisis be discussed as soon as possible. I suggest that we use the Language Hotspots list to contextualize this very human social phenomenon in appropriate ways to meet the needs of different student groups. I welcome suggestions for collaboration with colleagues on any of the issues I have raised here.

### Summary

The languages of certain areas are more at risk than others, but language loss everywhere has great consequences for the discipline of linguistics and for all humanity more broadly.

Given the finite amount of people, time and money possible, one must prioritize those areas where the loss of diversity will be most severe. Increased public awareness, using the Hotspots concept, has proven very successful for biodiversity activism, and this promotional metaphor should be similarly successful for increasing public awareness about, and engagement with, the global language extinction crisis as well.

The process of language endangerment involves isolation and a process of ‘invisibilization’ at the transnational, national, community and individual levels. The global model of Language Hotspots I outline here not only maps large-scale trends but also raises awareness and helps to build connections among communities and individuals that may find themselves in a situation of language shift. Furthermore, the global Language Hotspot list is intended to be used by both linguists and funding agencies as a way of prioritizing particular areas and languages so that, with coordinated efforts, successful documentation, maintenance and revitalization programs can be implemented and bear fruit, and the world’s diverse linguistic heritage can be maintained for future generations.

Language revitalization and maintenance programs are not really adequate without significant input from applied linguists and language education and pedagogy specialists. Coordinated projects with all stakeholders must be developed in the coming years to have maximal positive impact. Furthermore, public education must directly raise awareness about the social issues that language endangerment encompasses. This will help stop the crucial devaluing of linguistic diversity across society as a whole that triggers language shift in the threatened communities in the first place. This can only be achieved through a coordinated incorporation of the issues surrounding the global language extinction crisis into curricula spanning the full spectrum of educational levels. This society-wide change in ideology is imperative to give threatened minority languages a chance to endure through this century and beyond.

The Language Hotspots list is, to date, the only comprehensive scientific model designed to set research priorities and agendas. It thus not only should form a road map for the future of comprehensive and coordinated academic and community pursuits in documenting, revitalizing and maintaining endangered languages worldwide, but also as a leading promotional metaphor, it should serve as the anchor point for the contextualization and dissemination of information about the global language extinction crisis in the popular imaginary and as the foundation for the development of public media materials and educational curricula appropriate to all ages and levels.

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### Notes

1. Some sections of this paper represent slightly revised portions of a previous paper of mine (Anderson 2010).
2. In multilingual urban contexts, the construction of linguistic identities is extremely complex and varied. See Anchimbe (2007) for a recent discussion.
3. It is the diversity of language families that is encoded in the genetic index component of the Language Hotspot model (see the section ‘Language Hotspots’).
4. The rating of individual languages on a five-point scale of endangerment, averaged over an area, yields the *endangerment index* of a Language Hotspot.
5. The level of documentation of the languages of an area averaged is used to identify the *documentation index* of a Language Hotspot.



6. Basically, this encodes the probability of relatedness or lack thereof between any two randomly selected languages in the hotspot in question.
7. Of course, Romance and Germanic have been successfully placed in a larger secure taxonomic unit, i.e. the Indo-European language phylum. Note that many internal relationships that have been proposed to exist among the various recognized families of Indo-European remain controversial (except Indo-Iranian and maybe Balto-Slavic).
8. With some debate as to whether Sandawe and Khoe (along with the extinct and poorly attested Kwadi language) might form a higher-level unit of some sort, but one that would be larger than the level of genetic unit used here in the Language Hotspots model.
9. Some Language Hotspots are missing from the 2007 map, as this was intended to be a selection only (see Figure 1). Some but not all of these can be found on the Enduring Voices website map of the Language Hotspots (version 1.1) in Figure 2. A revised set of updated maps for all the Language Hotspots (version 2.0) is slated for release in early 2012.
10. Immersion schools coupled with some external (e.g. state) validation and financial support are where truly successful programs have been seen. This is, of course, difficult to impossible to come by for most endangered languages communities. Immersion schools are hardly a sure fire way to revitalize a language (see, e.g., Hickey 2007), but they are best among tried methods.
11. Today, the Matugar Panau Talking Dictionary is operational with nearly 3400 entries (<http://matukar.swarthmore.edu>). The community is scheduled to come online in 2011.

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