

# NOTES ON THE ECOLOGY OF LANGUAGE

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It is only recently that linguists and scholars have begun to understand the roles languages play in relation to the speakers who use them, communication communities, and the environment. After considering several phenomena that challenge mainstream approaches to language, I detail correspondences between biological species and language which demonstrate its functional, adaptive, and dynamic properties. These correspondences compel us to acknowledge that language is, indeed, an ecological phenomenon. I conclude with an examination of the linguistic ecology of East Timor.

## 1. Introduction

Languages do not exist in a vacuum. They are the result of long accommodation with the people who speak them and the environment in which they are used. The ecological approach to language considers the complex web of relationships that exist between the environment, languages, and their speakers. This approach demonstrates that the thousands of cultures and associated languages around the globe are sustained and, in a real sense, protected both by multiple layers of functional relationships that are manifest among communities of speakers and the protean quality of language itself. The relationships between them can explain, for example, how so many small languages flourish in areas of high linguistic diversity. This approach particularly forces us to acknowledge the interactive and constructed properties of language in that it considers how languages are shaped and changed by their environment and how, reciprocally, the environment (physical, biological and cultural) is shaped by languages.

Throughout, the ecology of language takes a functional perspective. The view is that languages are primarily motivated by the communicative uses to which speakers apply them in the environments the speakers inhabit. This is what leads directly to the interactive and constructed properties of language that have so often been marginalized in traditional approaches to the study of language. What has also been slow in coming is an appreciation for the fact that languages not only mirror the values and particular challenges of their employment in a particular environment, but languages are, also themselves,

agents of change in their own right, shaping the environment as speakers come to terms with the values and challenges presented to them by circumstance.<sup>1</sup>

## 2. Challenges to mainstream approaches

Many of the prevailing ideas about language are challenged when viewed from an ecological perspective. Languages are not conceived as autonomous, independent entities from the ecological point of view. Instead, they are treated as dynamic phenomena that are porous with respect to their physical and cultural environment. Languages are not bounded in space in the same way that the planet has been carved up into nation states. They are not things that exist independently of the people who use them, or the context within which they are used, or the communicative and social purposes to which they are applied. In brief, they are not entities which can be meaningfully abstracted away from their users and their environment. Being the result of historical processes, languages can only be understood in relational terms. If, as Halliday (2001) has proposed, that languages are “theories of experience” (p. 195), then languages can only be understood by examining the experiences and processes that shaped them.

By the same token, languages are not objects that can be easily distinguished and counted in all circumstances. This, of course, refers us to the thorny issues that have plagued linguists of all stripes for centuries: how to define ‘language’ and how to distinguish individual languages from a continuum of speech varieties. Counting languages leads back to the notion of independence, a notion considered largely irrelevant from the ecological perspective. In any case, naming and counting languages is a philosophical imperative that the Western tradition has imposed on its version of reality long before many traditional societies were studied. Most traditional societies do not have names for their own speech variety, referring to their language with a word that means ‘to speak’ and themselves simply as ‘the people.’ Instead of thinking in terms of individual languages or separable entities, the ecological perspective turns to a holistic taxon called ‘communication communities’ (Mühlhäusler 1996). A communication community is an ecological unit conceived as a whole system in which all language resources within a region are evaluated in terms of their functional relationships to each other, their speakers, and the contexts in which the languages are used.

These ideas can be illustrated by a short summary on the language situation in north-western New Britain, Papua New Guinea. In this example (taken from a study by Thurston, 1987 and cited in Romaine 2000), the question is put to the residents of the several communities, What language do the Bolo villagers speak?

“The language spoken in Bolo village is also from a linguist’s point of view identical to Aria, but Aria speakers from other villagers say it is not Aria. They say Bolo villagers really speak Mouk. However, the people of Salkei village, who speak Mouk, say that Bolo people speak Aria. As for the Bolo themselves, they claim to be Anem speakers! ... For their part, the Anem people do not think the Bolo speak acceptable Anem anymore. Thus this one village of Bolo, which is said to be Anem, Aria and Mouk-speaking, speaks a variety which no one else accepts as a legitimate member of their own language groups” (Romaine 2000, p. 8).

The sociological dimension in language identity is clearly evident in this example: the speakers themselves are not able to arrive at a consensus on what ‘language’ is it they speak. The structural analysis of language is insufficient in itself to define language. Mühlhäusler (1996) remarks, “It is difficult to understand why the very linguists that use such examples should assume that there is a culture-neutral unitary phenomenon ‘language’” (p. 43).

Like other dynamic phenomenon that are responsive to changing local conditions over historical time, language can be properly regarded as being embedded in networks of relationships just as is a biological species. The correspondences between language and species were first described by linguists in the wake of the publication of Darwin’s *On The Origin Of Species* in 1859 (see Alter 1999). Ideas in circulation at the time about languages (such as notions that European languages were superior by virtue of having passed through the improving furnaces of Western civilization) limited the usefulness of the metaphor at that time, but new information and perspectives have revived the idea.<sup>2</sup>

These correspondences have recently come to light in terms of the many parallels between biodiversity and linguistic diversity. In her study which examined, in part, the distribution of languages around the world Nichols (1992) observed that

“...genetic density [the ratio of language lineages to square miles in an area] is not uniformly distributed over the globe. High genetic diversity is evidently favored by coastline, tropical to sub-tropical climate and, at least in some cases, such as in the Caucasus and the Himalayas mountains. Low density is favored by high latitudes, drier and or more seasonal continental interiors, and also by the presence of large-scale economies and/or societies such as empire whose languages spread with their political/economic systems” (pp. 233-234).

Thus, higher linguistic diversity is found in those regions of tropical and sub-tropical climate where we would expect to find a high species diversity as well.

More specifically, Harmon (1996) found that 10 out of 12 countries classified as 'megadiversity' countries (that is, countries having the highest percentage of species endemism) were also among the 25 countries that he had identified as having the highest percentage of linguistic endemism. Thus, countries such as Australia, Brazil, China, and Indonesia were high on both lists. In another study, Nettle (1999) found that the seventeen Old World countries where ecological diversity is highest (two great equatorial belts including Ghana, The Ivory Coast, Togo, Benin, Nigeria, Cameroon, Zaire, Tanzania, in Africa; and India, Vietnam, Laos, Philippines, Malaysia, Indonesia, Papua New Guinea, Vanuatu, and the Solomon Islands in the Asia-Pacific) are regions where there is also high diversity of languages. These regions contain 27% of the world's population and occupy a mere 9% of the world's land, yet they are home to over 4000 of the world's languages—some 60% of the world's total of around 7000 languages (Nettle 1999:61-63).

It doesn't take much more than a casual perusal of the fifteenth edition of *Ethnologue* (Gordon 2005) to see that languages are unevenly distributed around the world. Africa, with over 2000 languages, and the Pacific, with over 1300 languages, together comprise over 50% of the world's languages. By contrast, Europe with 239 languages, accounts for only 3.5% (*Ethnologue*, p. 15). This unevenness is also found in terms of number of speakers of languages as well. As *Ethnologue* reports, there are 548 languages having between 1 and 99 speakers; 1,071 languages having between 100 and 999 speakers; and 1,967 languages having between 1000 and 9,999 speakers (*Ethnologue*, p. 16). That means that more than 50% of the world's languages have fewer than 10,000 speakers. By contrast, 50% of the world's population are first-language speakers of one of the top ten largest languages (including Mandarin Chinese, Hindi, Spanish, English, Bengali, Arabic, Portuguese, Russian, Japanese, and German). An ecological approach to language is indeed impressed with such figures and seeks for explanations for both the correspondences between linguistic diversity and biodiversity and the significantly uneven distribution of languages and numbers of speakers.

The similarities and differences between language and biological species are central to the ecological approach and these will be outlined below. These correspondences help us to understand not only the role languages play, but also the fragile state of languages in a functioning ecosystem. The sad fact is that languages have traditionally been treated as if they are something apart from the vitality of anything but abstractions in the minds of

speakers. George Steiner (1975/1998) wrote in his celebrated book *After Babel*, “With the simple addition of neologisms and borrowed words, any language can be used fairly efficiently anywhere: Eskimo syntax is appropriate to the Sahara” (p. 57). This is perhaps true in a limited and unhelpful sense. However, we are disabused of this naivety when we consider language as a player in an ecological system. In the similar vein, Steiner writes, “We have no sound basis on which to argue that extinct languages failed their speakers, that only the most comprehensive or those with the greatest wealth of grammatical means have endured” (p. 57). Would that we had a language sample from the Polynesian ocean voyagers at the time of their first presumed landing on Easter Island around 900 A.D. and again at the time of their contact with Dutch sailors on April 5, 1722, after the island had been reduced to an ecological wasteland (Diamond 2004). The differences in their ability to talk about their environment would speak volumes. Language is not epiphenomenal to the human experience; quite to the contrary, language is remarkable for its capacity to embed human groups in the social, cultural, and physical contexts of their existence. In many significant ways, the fate of languages is tied to the fate of the landscapes in which they are used. This is the lesson we draw from the correspondences between language and a biological species below.

### **3. Language and Species**

Although not living organisms in their own right, languages nonetheless share many properties with biological species. Table 1 provides a list of defining properties along which language and species may be compared.

The correspondences in Table 1 put the spotlight on the functional, adaptive, and dynamic properties of language. Because languages exhibit many of the same properties and processes that do biological organisms, the ecology of language has implications for a wide range of issues that apply equally to biological species such as the maintenance of linguistic diversity around the planet, the endangerment and extinction of languages, language planning, and the effects of ‘introduced’ or exotic languages on the environment. Table 1 below summarizes these properties.

We should be careful to distinguish a natural ecology from an exotic one (Mühlhäusler 2003). A natural ecology is one that has been left to develop without the intervention of outside human agencies such as the processes of nation-building, literacy, language planning, or other forms of institutionalization. Ever since the European age of discovery in the 1500s, Western languages have been transplanted to other parts of the globe usually supplanting or marginalizing the indigenous vernaculars. Transplanted languages have

**Table 1.** Similarities between languages and species

<b>PROPERTY</b>	<b>SPECIES</b>	<b>LANGUAGE</b>
<p><b>Diversity</b> Interdependence of organisms or languages organized in multiple layers of an ecological system.</p>	<p>Biological ecosystems display structured diversity at all levels of scale.</p>	<p>Communication communities exhibit a multilayered structural diversity: transnational and languages of inter-community communication at the upper levels; vernaculars at the lowest level.</p>
<p><b>Variation</b> The variation of organisms within a species or languages within a communication community.</p>	<p>Morphological variation is commonplace among biological organisms: for example, flower height, style length.</p>	<p>Variation forming continua are found on all dimensions of a language such as pronunciation and vocabulary.</p>
<p><b>Transmission</b> The passing on of information from generation to generation.</p>	<p>Transmission occurs only vertically from parent to offspring.</p>	<p>Transmission can occur both vertically (parent to child) and horizontally (e.g., borrowing).</p>
<p><b>Lineage</b> The formation of lines of descent over generations showing historical relationships.</p>	<p>Lineages are traced using comparative morphological, genetic, and fossil information.</p>	<p>Lineages are traced through sound and typological correspondences, cognates, and through surveying the migrations of people throughout history.</p>
<p><b>Selection and Adaptation</b> Those features that result in reproductive success are favored by selection. Such features have a high adaptive value.</p>	<p>Selection among species is the result of historical forces. Selection is blind.</p>	<p>Both deliberate and accidental selection can occur among languages. Speakers have the ability to create or choose adaptive features (memes).</p>
<p><b>Niche</b> Changes in the support systems result in corresponding changes in the survivability of the organisms or languages.</p>	<p>There is a wide range of niche sensitivity among biological organisms from 'weeds' (notoriously tolerant to many habitats) to many orchids (notoriously intolerant).</p>	<p>Sensitivity to change has resulted in language endangerment or extinction.</p>
<p><b>Rate of Change</b> The speed with which changes occur within a species or language.</p>	<p>Changes typically occur slowly over many generations.</p>	<p>Changes can occur rapidly, even within generations. Linguistic evolution outstrips biological evolution.</p>

created artificial ecologies and are thus not examples of communication communities in a natural state. To find linguistic ecologies that demonstrate natural processes at work in relatively undisturbed circumstances, we have to go to places such as the island of New Guinea or remote regions of the Amazon basin. It is these locations where the properties discussed below will be most clearly found in evidence.

### Diversity

Diversity is a measure of the number of different kinds of species or languages in a region. The most important property perhaps, a structured diversity refers to the interdependencies among organisms within the ecological system organized in a hierarchy of layers, each layer often nested within another in a scaled series. What is critical is not so much that there are large numbers of individuals or even large numbers of types of organisms, but that the organisms are meaningfully involved in these networks of relationships. A small pond will have a structured ecosystem of its own consisting of several layers; the pond is nested within a meadow ecosystem.

Examples of structured diversity among languages abound and can most easily be appreciated among communications communities in Indonesia and Melanesia. It is now common knowledge that this region stretching across the Indonesian archipelago from Sumatra to Fiji comprises the greatest number of languages of any comparable region in the world. *Ethnologue*, (Gordon 2005) reports 737 indigenous languages for Indonesia, 820 for Papua New Guinea, 70 for the Solomon Islands, 39 for New Caledonia, and 109 for Vanuatu, and 10 for Fiji representing 26% of the world's languages (1,785 languages altogether). Writing about the high linguistic diversity among Melanesian cultures, Laycock (2001) found that vernaculars function both as a badge of identification and for restricting membership. Language "in Melanesia is, in its very diversity, being used constructively, to hold social groupings to a small and manageable level — and conversely, to keep other groups at a distance" (p. 35). This situation combined with the high degree of multilingualism allows for the formation of multiple layers within the linguistic ecology (Mühlhäusler 1998).

The first layer consists of vernaculars that are often structurally highly complex. These languages are used only within the a speech community and employed in all domains. On top of this layer of local languages is the second layer consisting of languages used for communication with adjacent communities. A third layer would include a less complex interregional pidgin with restrictions on domain usage.

“Speakers of language A may apply language of intercultural communication B to communicate with immediate neighbors, and an even less complex language C to communicate with more distance trade partners and reserve a vastly simplified form of A for communication with occasional visitors or outsiders.” (Mühlhäusler 2000, p. 341)

The roles that each language plays with respect to different sociocultural groups define the critical relationships in the linguistic ecology. In this connection, Thurston (1979) developed a very useful distinction between esoteric languages (typically highly complex vernaculars used for communication with one’s own community) and exoteric languages (typically less complex languages or pidgins used among outsiders for intercultural communication). Exoteric languages are usually very easy for adults to learn and are restricted in their use domains whereas esoteric languages are notoriously difficult for adults to learn and are unrestricted in their use domains. This situation can account for the maintenance of small languages in areas of high linguistic diversity. The upper layers in the hierarchy in effect protect the local vernaculars. If these languages in the upper layer were suddenly stripped away or replaced by a powerful global language, there would be consequences for the smaller languages. In such a situation, it is doubtful that the smaller languages would survive. This, in fact, has been the fate of a number of language smaller languages over the past five hundred years (see Mühlhäusler 1996).

### Variation

This property refers to the variation found within any species or language. This can be thought of as a continuum along any given dimension for a property. Variation in language is easily captured by the meaning of the word *dialect*. Among English dialects around the world there are wide differences in pronunciation and vocabulary. Many of the languages of East Timor have several known dialects. Tetun is a good example: varieties of Tetun are found in southwestern and south-central East Timor and, in the capital Dili. A variety of Tetun is also spoken in West Timor where it has been heavily influenced by Malay-Indonesian.

Variation can also extend to language chains commonly found among communication communities in Melanesia. Language chains are the series of speech varieties that show variation in lexis or phonology from village to village: whereas the speech varieties of the most distant villages will be mutually unintelligible, all adjacent communities along the chain enjoy comparatively high degrees of mutual intelligibility.

### Transmission

Like individual organisms of biological species, languages are transmitted from generation to generation. Transmission of languages is achieved through cultural learning (Tomasello 1999) in the context of communication and through the learning of memes (Blackmore 2000). An important difference is that transmission in language does not only happen vertically, but can also occur horizontally across different speech varieties from word borrowing or the introduction of novel cultural ideas. Another difference is that languages do not make exact copies of themselves as do most biological organisms.

### Lineage

A lineage shows the historical relationships of species or languages. A proper lineage will indicate which species or languages are related to one another at various stages of development throughout their histories. While both species and languages form lineages, in language transmission can occur horizontally, that is across lineages, when for example changes are introduced into a language from outside sources. This is a frequent occurrence in contact situations where words or structures are borrowed from other languages. This is not the case with biological organisms where transmission is exclusively vertical, from parent to offspring. As a result, the lineages of languages tend to be more highly reticulated than those of species.

In biology the family tree model is the paradigm used to show relationships among groups of organisms sharing an evolutionary history. The family tree model has been applied successfully to explain historical relationships among groups of languages (for example, the Indo-European languages), but it cannot apply across the whole history of languages. The example of pidgin and Creole languages perfectly demonstrates how languages from genetically disparate backgrounds can be brought together within the space of a generation to create a new language. The linguistic ecologies of Melanesia show a high incidence of pidginized languages of communication superimposed on a layer of vernaculars.

### Selection and Adaptation

Just as the environment favors certain features over others producing an organism better adapted to its environment, so does the physical and cultural environment interact with and favor characteristics in languages. Both human (i.e., artificial) and natural selection operate to shape a language. In this sense, languages are also adaptive: that is, languages are interactively involved in making accommodations to their environment. The most

obvious forms of modification take place in the lexicon where we find, for example, fishing communities having many names for the different sorts of fish that constitute a significant portion of their diet. There are, however, many more subtler modifications found in the grammar of languages that are described by Halliday (2000).

To the extent that changes in languages are modifications that enable a people to understand, manage, and thrive in their environment, languages are a memory or a reading of their environment. They are “repositories” (Mühlhäusler 2003) of knowledge. Humans are unique from other species (for example, the chimpanzee) in that our cultural evolution is cumulative.

Some cultural traditions accumulate the modifications made by different individuals over time so that they become more complex, and a wider range of adaptive functions is encompassed—what may be called cumulative cultural evolution or the “ratchet effect.” (Tomasello 1999, p. 37)

Such modifications find their way into the vocabulary of a language, but may also modify the functionality of the language. Such changes exemplify the constructed and dynamic characteristics of languages.

Thus languages and species both change or evolve over time. This is evident in the historical records of the many languages that have had a written tradition for more than a thousand years such as some European and Asian languages. Changes in languages can occur through historical accidents, but also through contact with other languages and deliberate acts of change on the part of speakers.

### Niche

Languages also occupy an ecological niche as do biological organisms. A niche is the functional space inhabited by an organism that defines the network of inter-relationships between the organism and its environment. In the case of language, the niche would include the network of social, political, economic, and environmental spheres within which a community of speakers carry out their activities. Languages and species are both sensitive to shifts and changes in the support systems that maintain them. Experience has demonstrated how sensitive language ecologies are and how easily the natural checks and balances can be disturbed.

When ecologies are disturbed, the relationships that sustain the system break down. In biology, a well-known example of this is Kirtland’s warbler, a species of bird found on the

northern peninsula of Michigan, USA. This bird will only nest in young jack pine trees which are no taller than seven meters. Jack pines are a succession species, germinating in the soils of areas that had been burned. Because of Forest Service policies regarding fires and intense development, there today are far fewer stands of young jack pines in the Michigan forests, meaning fewer nesting sites for the warblers. The population of warblers was in serious decline until these relationships were understood and imbalances could be checked.

Languages are also in very serious decline (Wurm and Heyward, 2001). Recent estimates concerning the extinction of languages within the next 100 years range from 50% to as high as 90% (Hale 1992). This extinction event, which outstrips the parallel crisis in species extinction, is unprecedented in human history and has multiple causes including massive language planning projects in countries such as China and Indonesia which deliberately pursue policies inimical to the sustaining of endemic linguistic diversity, to the spread of 'killer' languages such as English through the dissemination of mass media, to the attitudes of speakers of minority languages who believe that no economic gain is to be had if their children learn the vernaculars (Nettle and Romaine 2000). Each of these represents the result of a disturbed ecology.

#### Rate of change

While both biological species and language undergo modification, another important difference between them is the rate at which changes occur. Dependent as it is on vertical, genetic transmission from generation to generation, a species can change only very slowly. By comparison, because language and culture can incorporate new memes horizontally within generations, languages can undergo modifications rapidly.

#### **4. Interim summary**

These correspondences between species and language are striking for the things they tell us about the life of languages. But most important is that they document the many ways in which language is an ecological phenomenon in its own right and the extent to which it is integrated in a network of relationships which are sensitive to changes both great and small. These insights opens up new possibilities for our understanding of language as the next section on the languages of East Timor will show.

#### **5. The Language Situation in East Timor<sup>3</sup>**

Like many Pacific island communities, East Timor has suffered the uncertainties and

cruelties of exploitation and colonialization by outside powers for centuries. Most recently, the victimization of East Timor under the brutal thumb of the Indonesian government and military entered the international consciousness in the summer of 1999. After a UN-sanctioned referendum on self-determination resulted in nearly 80% of the population voting for independence from Indonesia, the Indonesian military and paramilitary organizations unleashed a murderous rampage on the East Timorese leaving many thousands killed, many additional tens of thousands displaced to military camps in western Timor and elsewhere, schools, hospitals, and government offices throughout the region gutted and burned, and the capital, Dili, and major towns in ashes.

### The Languages of East Timor

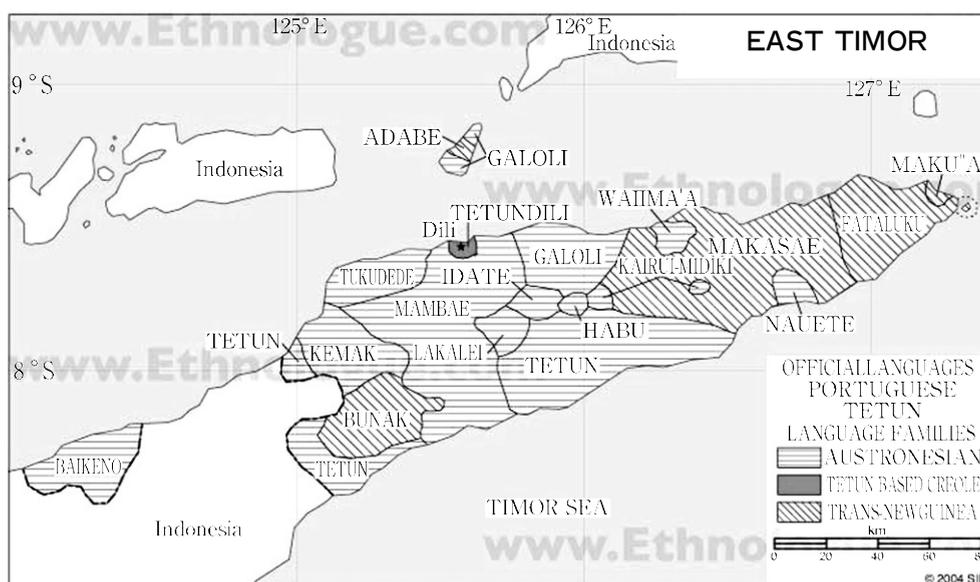
It is important to distinguish at the outset those languages that are indigenous to East Timor from those languages which have been transplanted into the ecology by outside occupiers. Of course, Portuguese and Indonesian were introduced by colonial powers. The role that they have played in the linguistic ecology will be detailed below. Hakka and Cantonese were spoken among the Chinese immigrant community during the latter part of Portuguese rule, but played no role in shaping the linguistic ecology (Hajek 2002). The most important indigenous language both historically and culturally is Tetun, the language eventually brought to the capital Dili by the Portuguese as the preferred medium (after Portuguese itself) for conducting its affairs with the East Timorese. There are several dialects spoken today: the more traditional dialect is known as Tetun Terik and is spoken in the southwest and south-central regions of East Timor (see the map in Figure 1); Tetun Praca, with significant lexical influences from Portuguese and Mambae, is mainly spoken as a first language in the capital Dili, and is also in wide use as a second language today in schools across the country. *Ethnologue*, (Gordon 2005) reports significant intelligibility problems between the two dialects. Tetun Praca functions as the *lingua franca* for the majority of the East Timorese. Both Portuguese and Tetun are accorded official language status by the new government; the constitution recognizes both Indonesian and English as ‘working languages.’

The number of indigenous languages in East Timor and their affiliation has always been in dispute. For numbers, the reports range from 16 (the number recognized by the government of East Timor)<sup>4</sup> to 21 languages (Fox 2000). In one example, *Ethnologue*, (Gordon 2005), in several recent editions, has recognized the Adabe language on Ataúro island, 50 km off the coast of the capital Dili. Hajek (2002) disputes this claim saying, “Although Adabe is listed as spoken on Ataúro, there is no evidence that this is really the

**Table 2.** Indigenous languages of East Timor (Gordon 2005)

Name	Number of speakers	Remarks
<u>Austronesian</u>		
Baikeno	20,000	(typically SVO languages) Language spoken in Oecussi enclave
Galoli	50,000	Found on Timor and Ataúro Island
Habu	1,260	Considered an archaic variety of Tetun
Idate	5,000	
Kairui-Midiki	2,000	
Kemak	50,000	
Lakalei	5,000	
Mambae	80,000	
Nauete	1,000	
Tetun	50,000	“Tetun Terik”
Tetun-Dili	50,000	“Tetun Prasça” National language
Tukedede	63,170	
Waima'a	3,000	
<u>Papuan</u>		
Adabe	1,000	(typically SOV languages) Found on Ataúro island
Bunak	50,000	
Fataluku	30,000	
Makasae	70,000	
Maku'a	50	Found on the northeast tip of Timor Island.

**Figure 1.** Languages of East Timor (courtesy of *Ethnologue*, Gordon 2005, p. 788)



case” (p.185). In his paper detailing the languages of East Timor, Hull (2004) describes four dialects on Ataúro of the language he calls Wetarese (after the island Wetar): Rahesuk, Resuk, Raklungu, and Dadu’a. These dialects do not, according to Hull (2004) form an Atauran language but are variants of Wetarese which itself is closely related to Galoli. Galoli is the second language recognized by *Ethnologue*, as spoken on Ataúro. For his part, Fox (2000) lists three languages for the island: Bikele, Makili, and Mukadae. Earlier editions of *Ethnologue*, listed Adabe as an Austronesian language; the latest edition (Gordon 2005) lists Adabe as Trans-New Guinea. It is likely that the speech varieties of Ataúro have not been studied in enough detail and there is little reliable information to go by. But it may also be the case that the speech varieties on Ataúro are difficult to pin down for precisely the same reasons that linguists have difficulty getting a grip on the language of the Bolo villagers on the island of New Britain. Linguists may wish to recognize structural or lexical affinities or base their judgments on ideas such as ‘mutual intelligibility’ whereas the speakers themselves are evaluating languages along entirely different dimensions relating to their relationships with speakers of other communities and the functions that communication with those speakers serve.

The languages of East Timor are classified into two phyla: Austronesian and Papuan (also referred to as non-Austronesian or Trans-New Guinea languages). *Ethnologue*, (Gordon 2005) lists 18 indigenous languages and provides the breakdown in Table 1. Figure 1 (Gordon 2005) is a map of East Timor indicating the regions and approximate range for each language.

It is difficult to evaluate the reliability of the figures listed for the languages by *Ethnologue*, in Table 1 in light of the violent events and mass resettlements of people by the Indonesian military before and after the referendum of 1999. Many of the figures for speaker numbers have not changed from an earlier edition of *Ethnologue*, published in 1996.

### A Historical Sketch of East Timor

The West first became aware of the island of Timor through the Portuguese explorations in the 1500s. Very little is known about the island from that time, except that there was an abundance of sandalwood which could be easily taken in large quantities. Mention of the island appears in Chinese chronicles in the 14<sup>th</sup> century in connection with sandalwood as a trade item. Although nominally a Portuguese colony from the 1500s until 1975, the Portuguese never fully controlled the colony or took serious interest in it until the late 19<sup>th</sup> century. Most of the contact with Portugal was the result of either Catholic missions dating back from the Dominican fort established in 1566 or exploitation of the island’s

resources. There were numerous conflicts for control of the island (including the 1642 battle to crush the powerful Tetun-speaking Wehali kingdom or chiefdom), but apart from these, the Portuguese preferred to rule from a distance and maintained a minimal presence in Dili. It was only in the 1950s and 1960s that the authorities attempted to spread the Portuguese language and culture through mass education, in the hopes of 'civilizing' and eventually extending full citizenship to members of its poorest colony. This lasted until 1974 when a military coup in Portugal led to a regime change, the impetus for a renewed political awakening in the colony. The right-wing government was replaced by a left-wing government more sympathetic to the East Timorese desire for independence. In a very short time, a civil war ensued and the East Timorese nationalist organization known as FRETILIN emerged victorious in 1975. Having finally escaped the yoke of colonialism lasting more than 400 years, this victory was cut short by the Indonesian invasion later in the same year.

The Portuguese left essentially two lasting modifications to the linguistic ecology of East Timor in their wake. Having moved the administrative and military center from Oecussi enclave to the new capital in Dili in 1769, the Portuguese also took along with them the language they had used as a means of communication with their colonial subjects: Tetun. This language was historically prestigious because of its use by the Tetun-speaking kingdoms. The use of Tetun around the Dili area took root and is, to this day, the principal language of communication in the capital. After the second world-war, Tetun became widespread as a language of intercultural communication in West Timor.

The second change is in the addition of Portuguese to the language inventory of the colony. Because of the long tradition of multilingualism among the East Timorese, however, and because there were no systematic attempts to spread Portuguese until very late in Portuguese rule, the language was never a threat to the indigenous ecology. In 1970, fewer than 0.2% (Hajek 2002) of the population of East Timor were ethnically Portuguese (around 1500 Portuguese residents out of a total population of around 610,000). It is estimated, however, that through the massive schooling projects undertaken by the colonial government in the last decades, many Timorese had at least rudimentary knowledge of Portuguese. Thus after 500 years of colonization by the Portuguese, the linguistic ecology was only minimally affected and no indigenous languages were known to have been driven to extinction. This felicitous picture was the result of indifference and neglect on the part of the Portuguese rather than conscious design. The situation changed dramatically, however, after the 1975 Indonesian invasion.

The Indonesian occupation lasted 24 years. A matter of public record, it was a time of

violent and brutal repression during which up to one third of the population lost their lives (200,000 out of 600,000 people) and many thousands of others were forcibly displaced. Indonesia was determined to wipe out all the evidence of the Portuguese influence and, at the same time, through measures such as controlling the media and education, inculcating the Indonesian language and culture in the people of East Timor. The use of Portuguese (stigmatized as a 'colonial language') and Tetun in schools was forbidden and Indonesian was touted as the new *lingua franca* to be employed in all domains of life, the key to the Indonesianisation East Timor. The use of Indonesian spread predictably and, by the 1990s, the authorities (who were very carefully monitoring the progress of the spread of Indonesian) estimated that 60% of the population spoke Indonesian. But, as Hajek (2002) and others have pointed out, this statistic has to be weighed against the fact that the non-East Timorese Indonesian population had swelled to include 250,000 out of the 867,000 total number of residents in East Timor for the same period. While the Indonesian government discouraged anything but the use of Indonesian, it grudgingly allowed Tetun to be used (in place of Portuguese) in Catholic church services. Also seen by the local population as a language of resistance, the use of Tetun spread widely among East Timorese during the 24 years of Indonesian occupation.

While Tetun flourished on its newly acquired status as the language of the opposition, East Timor's other indigenous languages succumbed under such pressures as mass relocations of villages to resettlement areas and other Indonesianisation policies. One linguist reported on the 'virtual extinction' (Carey 1997, cited in Hajek 2002) of East Timor's indigenous languages, but the situation seems not to have been as dire had been believed. While it is clear that these languages could not have survived in the long-term under such intense pressure, they proved to be remarkably resilient in the face of such threats. Only one language, the very small language called Maku'a, is reported to have been considerably diminished.

The criminal activities of the Indonesian military and military-supported paramilitary bands before and immediately following the referendum of 30 August 1999 devastated the linguistic ecology of East Timor, perhaps permanently. Within the space of weeks, up to 80% of the infrastructure had been destroyed and up to a quarter million East Timorese were displaced, many of them forcibly removed by the Indonesian military. Whole villages were destroyed and entire populations were carried away.

In the meantime, expatriate groups supporting the independence movement for East Timor had been busy preparing for the time when the island would be free of Indonesian occupation. In 1998, the CNRT (Timorese National Resistance Council) headed by

Xanana Gusmao approved a document they called the Magna Carta in which they proclaimed that, in post-independence East Timor, the official language of the nation would be Portuguese, the national language, Tetun. (This situation has changed somewhat. The government now accords equal status to Portuguese and Tetun: both are regarded as ‘official languages.’) Almost paradoxically, during the Indonesian occupation, Portuguese had gradually become to be seen as a language of resistance and was championed by many expatriate pro-independence East Timorese. They later outlined a plan to phase out, over a 10-year period, Indonesian as the medium of instruction and replace it with Portuguese and Tetun. In the wake of the post-referendum violence, however, most of the non-East Timorese, including thousands of Indonesian educators, abandoned the region. For this and other reasons, the slow phasing out of Indonesian may have been jeopardized and it seems that Indonesian may have been unwittingly eliminated from East Timor earlier than had been envisioned.

The decision to accept Portuguese, on the surface, seems a queer one. In fact, the decision has been the source of much wonderment both by scholars and East Timorese alike. Richardson (2002) quotes a teacher in East Timor reporting on his students’ attitude to Portuguese: “Some of my students ask: Why should we have to learn this colonial language?” (Also, see the East Timorese government website where similar sentiments are reported about the choice: <http://www.gov.east-timor.org>.) The same teacher quoted above noted that “only one of the 15 teachers at school can speak, read and write Portuguese” (Richardson 2002). Molnar (2005) reports in some detail her observations concerning the attitudes about the choice of Portuguese by residents of Atsabe. During her ethnographic research in 2002, she heard students and teachers alike say “that they need to learn English since that is the *true international language* (their phrasing) and if they are to have future opportunities in education or jobs Portuguese will not help them much.” Molnar continues, “At times an extremely strong anti-Portuguese language sentiment was expressed which reflected the general attitudes of the Atsabe Kemak who were vociferous in their critique of the national language [i.e., Portuguese] choice with reference to future opportunities for participating in a global arena.” Local community leaders in Atsabe estimated that less than 1% of the total population of the Atsabe subdistrict were fluent in Portuguese. Molnar admits, however, that she was not certain if the figure represented an accurate accounting of fluent Portuguese speakers in the region or whether it was “more an issue of ‘silent resistance’ to a national language choice and policy that was not favored by the majority of the Atsabe people.” Nonetheless, Molnar found that these people did see Tetun as the “true national language” and that Tetun and the several local

dialects of Kemak were the languages used on a daily basis in the subdistrict, although Indonesian was commonly used as well.

Some very interesting findings (and perhaps the most comprehensive and up-to-date) on the issue of language use among the East Timorese can be found as a part of the *East Timor Survey of Voter Knowledge (Preliminary Findings)* carried out by The Asia Foundation in February and March of 2001. They conducted in-person interviews with a total of 1,558 potential voters in 196 villages in all of East Timor's 13 districts. Their main findings for language are presented below in Table 3 (adapted from The Asia Foundation 2001, p. 70).

The orthography for the indigenous languages in Table 3 is not identical to that found in Table 2, but we can easily figure the correspondences nonetheless (e. g., Makasa'e refers to Makasae; Kairui refers to Kairui-Midiki, etc.). "Tetum" on Table 3 presumably refers to "Tetun-Dili" or Tetun Praca on Table 2, the dialect of Tetun widely used as a national language. Importantly, from the point of view of a language ecology of the country, six of the smaller languages are not represented in the survey: Habu, Idate, Lakalei, Waima'a, Adabe, and Maku'a. Thus this survey cannot, from the standpoint of language, be considered entirely representative of the state of the country in spite of their claim otherwise ("Because the sample is truly national and random, the survey results represent all parts of the population in their correct proportions" p. 10). These results, nonetheless, present a partial snap-shot of East Timor's language situation and provide some very telling statistics on mother tongue languages and language use.

Most interesting is the percentage of Tetun Praca mother-tongue speakers (43%) and the extent to which the national language is spoken (91%) and read (58%) around the country. If we generalize these survey results to the population as a whole (notwithstanding the observation above concerning the lack of representiveness in terms of small language speakers), these results suggest that 48% of the population are second-language speakers of Tetun Praca confirming the reality of its status as a *lingua franca* throughout the country. This also tells us that 57% of the population are first language speakers of one of the indigenous languages, reminding us of the high level of linguistic diversity. What is surprising is the fact that there are no mother-tongue speakers of Indonesian (although 63% speak it, and 43% read it, as a second language) in spite of 27 years of continuous occupation and pressure on the East Timorese to adopt the language. Equally surprising is the finding that 17% of the population speak and 14% read Portuguese. (These later results must be encouraging to the government in spite of the widely reported unhappiness over the choice of Portuguese.)

**Table 3.** Mother tongues and speaking/reading competencies

Language	Mother Tongue	Speak	Read
Tetum	43%	91%	58%
Indonesian	*	63%	54%
Portuguese	*	17%	14%
Mambae	7%	24%	6%
Makasa'e	12%	14%	2%
Bunak	5%	9%	3%
Galolen	7%	9%	1%
Baikeno	6%	6%	1%
Fataluko	4%	5%	3%
Tokodede	5%	5%	*
Tetum terik	3%	5%	*
Kairui	4%	4%	1%
Kemak	2%	3%	1%
Nau-eti	2%	2%	*
Illiterate			34%
Refused to answer			1%

\* refers to less than 1% of respondents

Table 3 is also revealing in other respects. It sheds some light on the extent of bi- or multilingualism. After Tetun Praca, Mambae has the second largest number of second-language speakers (17%) while most of the remaining languages listed each have a small number of second-language speakers. At the same time, the figures for mother-tongue speakers for all but Mambae and Makasa'e point to the difficulties that these other indigenous languages of East Timor will have to overcome in the future. Each of the remaining listed languages represents fewer than 7% of the population, and the six indigenous languages not appearing in the chart have, presumably, an even lower representation. A most melancholy table, it would seem a harbinger of events to come: an obituary announcing the premature death of six unrepresented languages and, at the same time, a direct challenge to the remaining *under* represented languages.

So far as the government is concerned, the problem of instructing the East Timorese public in the Portuguese language has at least been partly resolved in the form of a gift from Portugal. The government of Portugal agreed to put 140 teachers on loan under an education aid program. Nonetheless, many East Timorese who fought for independence appear to feel disenfranchised by the decision claiming that it undermines their prospects for jobs and it is discriminatory. In fact, the debate has sparked acrimonious debate

between commentators on both sides of the divide. This is evident in the exchanges between editorialists of Australian newspapers and proponents of the decision to choose Portuguese.<sup>5</sup>

Under this new vision for East Timor, the position of the Tetun Praca language appears to be assured. The fate of indigenous languages, however, is uncertain. Article 13 of the Constitution states an intention to “preserve and foster” these languages (see Note 3), yet there have been no policy guidelines from the government concerning the future role that indigenous languages will play, if any, in the life of the country. The government does give certain indigenous languages including Fataluku, Kemak, Makasae, and Galoli “official recognition” (according to the same government website above), but it is unclear what this means and what impact it will have on the future of these languages.

#### Ecological considerations in the languages of East Timor

From the point of view of language, the history of East Timor can be divided into four periods: the pre-European period before European contact; the Portuguese colonial period lasting from the 1500s to 1975; the Indonesian colonial period from 1975 to 1999; and the post-independence period beginning in 1999.

It is likely that the linguistic ecology was stable prior to the arrival of the Europeans. The communities at the time may have included groups of far more than 500 speakers (by comparison with the regions of the highest linguistic diversity in Melanesia where communities are typically fewer than 500 people — Laycock 2001), with each language featuring a wide variety of local dialects following on the situation that we find in East Timor today. The structure of the ecology probably included at least two layers, the lower consisting of local vernaculars and the upper one of languages of intercultural communication. A third tier likely served as a language of regional communication such as Tetun which, according to Hull (2004), had already been a contact language used through central and eastern Timor under the Wehali Kingdom. This might have been the situation at the time of the European arrival in the 1500s.

Over the centuries, the Portuguese made cultural, political, and economic inroads into the island of Timor. They didn't, however, come alone to the island with only their language. They also brought with them their animals, their plants, their diseases, their intentions to mine the island for its resources, their religion, ideologies, ways of life, and, finally in the later years, it is no exaggeration to say, their hopes to fashion the people of the island in their own image by having them adopt the Portuguese language, culture, and ultimately, citizenship. We would be interested to know how these many transplanted cultural

artifacts and notions changed the way of life of the indigenous populations and how these changes are mirrored in modifications to the languages themselves. How, for example, did Catholicism transform the formerly animist peoples' way of talking about their origins and mythologies? How, for example, did the transplanted values from a European power undermine the way the indigenous peoples of Timor live in and talk about their environment? If there had been throughout Timor vast forests which were greatly reduced or destroyed by the occupying power for their precious sandalwood and timber or for space to pasture their ruminant livestock, these events would have had corresponding effects on the behaviors and languages of the people who had depended on the forests for their own livelihood. An ecological approach to language would look for connections and influences among these events and record their effects on the discourses of the indigenous peoples and their languages.

Apart from these deeper transformations to the physical and cultural landscape of East Timor that the Portuguese had induced, they left behind two major changes to the linguistic ecology mentioned above: the Portuguese language itself and the further promotion of Tetun as a regional language. Although not widely used by the Timorese, Portuguese had a lasting influence on the vocabulary of the variety of Tetun spoken in Dili, as did Mambae. (Other varieties of Tetun spoken in East Timor, found in the south-central and southwestern parts of the country, are more conservative. The varieties of Tetun spoken in West Timor are heavily influenced by Malay-Indonesian.) Portuguese is believed to have had little effect on the overall language picture for two reasons: the tradition of multilingualism among the East Timorese and the fact that the Portuguese did little, until the last decades of their colonial rule, to promote the language. In contrast, Indonesia was zealous in promoting the Indonesian language while stamping out all signs of Portuguese. Not surprisingly, the influence of the Portuguese and the Indonesian occupations is captured by the statistics on the Tetun, Indonesian, and Portuguese language abilities of the East Timorese, according to the age of the speakers.

While 96% of those under 25 speak Tetun, this can be said of 77% of those over 50. Eighty-three percent of those under 25 can speak Indonesian, as opposed to only 27% of those over 50. Twenty-seven percent of East Timorese between the ages of 35 and 50 can speak Portuguese, as opposed to only 11% of those under 25. (The Asia Foundation 2001, p. 69)

How can the language situation of East Timor today be characterized from an ecological

perspective today? Clearly, the ecology is in a state of upheaval. There are many competing interests at this time in terms of the languages of East Timor and it is impossible to predict the outcome.

In any case, we want to have more than merely an inventory of languages. We want to know the functional relationships between the vernaculars to determine the extent to which they form a coherent system. Importantly, we would want to know about the level of multilingualism throughout the region. We also want to know more about the relationships between the ethnic communities, their social organization, and their attitudes towards the languages they use, particularly towards the vernaculars. It is remarkable, for example, that the linguistic diversity had survived intact up until the departure of Indonesians in 1999. What can account for the resilience of the linguistic ecology in the face of so many pressures and threats? Can we hope for the same in the future?

On the surface, it would seem that, given the additional boost by the Portuguese, Tetun has long served as a regional language of inter-cultural communication. *Ethnologue*, (Gordon 2005) reports that fluent second-language speakers can be found throughout the western two-thirds of the country. Also, as reported above, The Asia Foundation has reported a high of 91% competence of Tetun as either a first language or a second language among survey talkers. For the short-term, at least, Tetun Praca will continue to play a leading role in the country, but challenges may be waiting just beyond the horizon.

What conclusions can we draw about the future of the East Timorese language situation? In particular, what will be the effect of reintroducing Portuguese into the language mix? It would seem that the government fully intends all East Timorese to become fluent in Portuguese. Presumably, if the government succeeds in its ambition, Portuguese will take over the domains that had been reserved exclusively for Indonesian. But will it go further? How far will the use of Portuguese penetrate into the social fabric of the indigenous communities? There are great differences between Portuguese and Indonesian in terms of their origin, their past histories and connection with the people, and their reach. Indonesian was a regional language in place on the island of Timor in its earlier incarnations as a trade language long before the Indonesian invasion of 1975. It was promoted by the government as an instrument of Indonesianization, a means of unification. In contrast, Portuguese is a global language. Worldwide, Portuguese accounts for some 180 million speakers and is one of the ten largest languages. The East Timorese government is reportedly following an aggressive campaign in promoting the globalizing potential of Portuguese (Molnar 2004), pointing to its power to deliver access to the international stage. Recently East Timor also joined the Community of Portuguese Speaking Coun-

tries, an association that includes Angola, Brazil, Cape Verde, Guinea-Bissau, Mozambique, Portugal, and São Tomé and Príncipe. It is doubtful that, this time around, Portuguese will have as little effect on the overall language ecology as it did half a century ago. It would seem that the greatest competitor that Portuguese faces in the language stakes game would be Tetun. (One also wonders if there will there be a role for English in the future of East Timor? At this time, it is reported that some 1% of the population is competent in English, this ability being found especially among the returning expatriate population.)

Concerning the indigenous languages, however, it is unclear what the government's intentions are with regard to maintaining the linguistic diversity on East Timor. It seems to have made at least tentative steps in a positive direction by bestowing "official recognition" to several of these languages, as mentioned above, and by declaring an interest in maintaining the linguistic diversity. The government faces many challenges ahead, and the preservation of the country's linguistic heritage may be sidelined by other considerations. This would be unfortunate, as the social health of the country depends, in part at the least, on supporting the traditional linguistic ecology.

There are many questions that deserve attention if the linguistic ecology of East Timor is to be understood. Still, it may be some time before the country has fully recovered from years of occupation and forced removals. East Timor, traumatized by the horrific events of 1999, will continue to face a period of healing and reconstruction for years to come.

## **6. Conclusion**

The ecological approach to language, while challenging many ideas from traditional linguistics, at the same time offers fresh and exciting perspectives through which we are able to appreciate the place of languages in natural ecologies. From this perspective, linguistic diversity is hardly the curse portrayed by the Tower of Babel story in the Old Testament. Diversity is instead seen as a natural outcome of a healthy ecology, an essential component of a natural system that sustains the cultural and social lives of groups coexisting in diverse environments.

On the other hand, it is a mistake to suggest that all traditional peoples, by virtue of participating in natural (in contrast to exotic) linguistic ecologies, have (or have had) all the answers to our environmental problems or are philosophically pure in their approach to living in the natural world or are themselves conservationally-minded ecologists who know instinctively how to keep the world a healthy place in which to live. Some writers, in their passion for championing the cause of indigenous peoples and promoting green

issues, err by going too far in their claims for traditional knowledge and lifestyles.<sup>6</sup> Diamond (2004), in his book aptly titled *Collapse*, chronicles the history of several traditional peoples of the past who had failed to strike a balance with their environment, in some cases, creating deserts in places that were one thick forests, and became the victims of their own carelessness or ignorance.

The great strength of the ecological approach, however, is that it brings humanity one step closer to our rightful place as fellow creatures on this planet. Charles Darwin, facing tremendous opposition from a tradition-bound European and American public, courageously took the first huge steps in this direction. And yet even today, language continues to be treated as something entirely apart from the human ecology, as if language were an abstract entity that had been dropped into our brain through some mysterious agency and therefore has no precedent in the natural world. The ecological approach (together with complementary disciplines such as cultural psychology that openly embrace functionalist perspectives — see Tomasello 1999, 2004) forces us to acknowledge the many fascinating roles and relationships that language enjoys in the life of our species. Through this recognition, we may come to value the diversity that thrives around us today and to protect it from further degradation.

#### Notes

1. Few scholars are involved in studies that take, as a point of departure, language as an ecological phenomenon. At present, the most active are Salikoko Mufwene, Alwin Fill, and Peter Mühlhäusler. My debt to Peter Mühlhäusler (especially to his 1996, 1998, 2000 publications) for many of the ideas and positions that I have expressed in the present paper will be evident.
2. Drawing comparisons between biological species and languages is not without its detractors today. For example, Kibbee (2003) writes, “I reject the equivalence of language to species, and the notion that a loss of language is equivalent to the loss of a natural species.” Relying on historical precedents by claiming that “the ‘language equals species’ equivalency does not work now any better than it did then [in the 1870s and 1880s],” Kibbee does not offer any substantive reasons on which to base his rejection, other than to say that “a language is a behavior, not a physical object” (p. 51) and to state the obvious, that biological species and languages may indeed form lineages in different ways. He does, however, go on to explain that “A language dies when the speakers of those languages die out or when they stop using the languages” (p. 53). This is very much like explaining that the seven million Jews disappeared from Europe during the second world-war because they had all died. His explanation does not address the underlying processes that caused the speakers to die out or to stop using those languages that became extinct.
3. For this section, I have drawn principally from the following sources: Carey & Bentley 1995, Gordon 2005, Hajek 2000 and 2001, Hull 2004, and Molnar 2005. For a comprehensive survey of

- the language situation in East Timor, see Hajek 2001. Additional sources are noted in the text.
4. For information on the languages of East Timor (and for position papers that appear to faithfully reflect the government's views), refer to the website of the Instituto Nacional de Linguistica, Universidade Nacional Timor Lorosa'e at:  
<http://www.shlrc.mq.edu.au/~leccles/>
  5. For example, see the reply to a September 2002 editorial (<http://www.onlineopinion.com.au/view.asp?article=1558>) featured in On-Line Opinion: Australia's Journal of Social And Political Debate given by Geoffrey Hull (<http://www.onlineopinion.com.au/print.asp?article=1557>) of the Instituto Nacional de Linguistica, Universidade Nacional Timor Lorosa'e. Other exchanges are to be found on the Instituto Nacional de Linguistica, Universidade Nacional Timor Lorosa'e website at: <http://www.shlrc.mq.edu.au/~leccles/>
  6. For example, Jeffrey Wollock writes, "Traditional peoples understand the basic principle, rediscovered by modern ecology, that complex systems are highly stable and simple systems are highly unstable. Thus, they understand that the more complexly they can develop their land management systems, the more stable and equitably distributed will be the food supply." (*How Linguistic Diversity And Biodiversity Are Related*. Terralingua Discussion Paper #5. 1997. On-line at: <http://www.terralingua.org/DiscPapers/DiscPaper5.htm>)

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