Ethnobiology

Aung Si

The Traditional Ecological Knowledge of the Solega

A Linguistic Perspective

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A Linguistic Perspective

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Chapter 1
Introduction

Fifty years in the past, a Solega person might have readily volunteered, "*Namma ka:ḍu senda:gade*", "Our forest is beautiful", when asked to describe their homelands in the Biligiri Rangaswamy Hills (B. R. Hills) of Karnataka State, southern India. This was a time when the forest understorey was dominated by tall grasses, and old trees fell only to be replaced by young saplings, when wild mammals, big and small, were plentiful and well fed, when the fragrant honey gathered by ground-dwelling bees from wildflowers provided sustenance to people on long forest walks, and when families were free to clear patches of the jungle with fire to grow crops. Today, Solega elders are far more likely to say, "*Namma ka:ḍu senda:gittu*" "Our forest *was* beautiful". The changes that have occurred to the ecology of the Solega's forests in the last five or six decades—in particular, invasion by the woody weed *Lantana camara*—have had a devastating effect on biodiversity, the behaviour of wild animals, and the regenerative capacity of the forest, according to local observers [1]. Moreover, they have radically altered human interactions with the forest, as common foods, medicines and building materials become scarce, and ancient forest trails and sacred sites risk disappearing under impenetrable thickets.

This book attempts to present Solega ethnobiological knowledge as a coherent system that has survived these changes for the time being. Both the Solega language and ethnobiological knowledge are currently threatened by language shift (to the locally dominant language Kannada) and lifestyle change, partly because of institutional pressures, and partly as a result of increased contact with mainstream Indian society. There is, consequently, an urgent need to document not only the language in its own right, but also those elements of cultural heritage that are encoded in language. The following chapters are a documentation of Solega ways of conceptualising the forest, its organisms and associated natural phenomena. It is centered primarily on the ideas and relationships encoded in the Solega language, as well as the encyclopaedic knowledge of the people who speak it. A variety of topics is investigated in these chapters, ranging from ethno-classification to detailed life-history descriptions of a single group of culturally-important organisms.

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1.1 A Brief Introduction to the Field

The field of ethnobiology has come far in a short period of time, and currently engages practitioners from a range of academic backgrounds. In his review of the state of ethnobiology at the turn of the millenium, Ford [2] listed as many as 16 different sub-fields in which papers had been published in the *Journal of Ethnobiology* since its launch in 1981. These covered subjects as diverse as classification, conservation, nutrition, pharmacology and zooarchaeology, to name just a few. Papers dealing with linguistic issues formed a distinct minority in Ford's tally, and nearly all of these focused on ethnoclassification as their object of study. In contrast, this book takes a holistic, but consciously language-centred, look at the knowledge people have of the natural world, and investigates topics that include not only folk classification, but also folk ecology at the level of the landscape, semiotic knowledge in terms of meaningful signs and the relations between plants and animals (including humans), and the detailed knowledge of the life history of a particular group of organisms. First however, I provide a brief introduction to the field of ethnobiology and its connections to human language.

1.1.1 Documenting Language and Traditional Knowledge Simultaneously

The ethnobiological knowledge or traditional ecological knowledge (TEK) of non-industrialised societies has, in recent decades, come to be viewed not only as an important part of a community's cultural heritage, but also as a vital resource for researchers involved in activities like conservation biology [3, 4]. As a result, many biologists are now calling for an active engagement with such communities, with a view to making them stakeholders in any conservation efforts. In many cases, such partnerships have led to real-world conservation outcomes that have benefitted both the community and the natural environment [5, 6]. There is also a growing awareness that the work of linguists and anthropologists only further strengthens this enterprise, as their culturally-sensitive 'emic' perspectives perfectly complement the biologists' 'etic' compendium of objective facts [7]. The work of language documentation is similar in many ways to that of conservation biology, in that both are contingent on a strong appreciation of diversity. While it is heartening that language documentation has developed into an independent field of research in recent years, this young discipline also has much to gain by engaging with other, complementary fields. Speakers of small, endangered languages, especially those situated far from urban centres, routinely engage with their natural environment, as they go about the mundane tasks of obtaining food, fuel, water and building material. The languages of such communities come to encode much encyclopedic knowledge about biological and ecological entities and phenomena. This knowledge is as important as the knowledge of religious practices, local customs and taboos and kin-based relationships in allowing a person to be a fully-functioning member of his/her community.

1.1.2 Defining 'Ethnobiology'

'Ethnobiology' is practiced in many guises by researchers with diverse skill sets and academic persuasions, and so it is unsurprising that this term now encompasses studies that approach the investigation of TEK from a variety of angles. The following section, which describes some of the main focus areas of ethnobiological research, contains extracts from a paper published in the journal *Language Documentation and Conservation* [8].

An obvious entry point into the biological domain in a given language is the naming and folk taxonomy (classification) of living organisms in that language. This facet of ethnobiological knowledge has generated much research interest in recent years, with considerable effort being expended on the question of whether there are universal patterns in folk classifications across the world's languages. An influential publication in this respect was Brent Berlin's [9] *Ethnobiological Classification*, a summary of more than two decades of research by Berlin and his colleagues on this topic (see also [10–12]). This monograph presented evidence from unrelated languages to make a case for the existence of many linguistic universals in folk classification and nomenclature. Since then, there has been a flurry of reports from ethnobiologists scattered around the globe purporting to 'confirm' the claims made in Berlin. Some researchers remain sceptical, however (e.g. [13, 14]), and maintain that far more languages need to be investigated in detail in order to address the issue of universals.

A language community's knowledge of the natural world cannot be easily teased apart from what might loosely be termed 'cultural' knowledge; the latter, in turn, often runs seamlessly into the domain of religious belief. The interaction between the seemingly objective knowledge of the natural world and a community's subjective cultural attitudes and belief systems can be an interesting field of study in itself. This is best exemplified by the writings of the English anthropologist Ralph Bulmer, who worked extensively with the Kalam people of Papua New Guinea in the 1960s and 1970s. In his classic paper *Why is the cassowary not a bird?* he convincingly demonstrates there are many reasons why Kalam speakers do not classify this large flightless bird as a *yakt* 'flying bird or bat'—these reasons go beyond mere objective 'facts' such as physical appearance or lack of flight, and are instead firmly situated in the very special (kin) relations that cassowaries are meant to share with humans in Kalam mythology [15]. Incidentally, Bulmer [16] himself suggested a typology of ethnobiologists, including investigators whose primary orientations were: (1) lexicographic, with an emphasis on biological vocabulary, (2) formal, in that they focussed on taxonomic logic, (3) social, Roy Ellen being prominent among these (see below) (4) biological, i.e. professional biologists who develop an interest in traditional knowledge systems, and (5) natural–historical, of which category he claimed membership.

The management and use of a particular natural resource by a community has frequently been investigated by anthropologists and ethnobiologists. A good example in this respect is the study by Roy Ellen on the cultivation and harvest of sago palms for their edible starchy pith by the Nuaulu of eastern Indonesia. Ellen [17]

discusses how a variety of factors—ecological, genetic and anthropogenic—have conspired to minimise the visible morphological variation in sago palms, and how this has resulted in a reduced number of varietal names for this species (in contrast to other heavily cultivated species like rice and bananas) in various languages in this part of the world.

Indigenous knowledge of local ecosystems, and the species contained therein, has great potential to inform scientists and conservationists of hitherto unknown aspects of ecology and behaviour. It has been noted that the 'diachronic' knowledge base (diachronic, in that the knowledge has been collated over innumerable generations) of traditional peoples, perfectly complements the 'synchronic' observations of western science [18]. The past decade has seen a great deal of interest in such 'applied' aspects of ethnobiology, as scientists come to realise that much can be learnt, from indigenous peoples, about sustainability, natural resource management or even basic biology [3]. Subsistence or artisanal fishermen, for instance, can be a valuable source of information of the breeding habits, diet and migration patterns of commercially-important fish (e.g. [19]). The information gathered in such studies is often new to science, and may prove crucial to the management of rare or endangered species.

The types of studies described above have the potential to document information about the natural world that is valuable not only to the indigenous communities consulted in the studies, but also to academics in a range of fields. However, one major drawback of some ethnobiological studies is that the data are presented in the academic literature in a form that is, for all practical purposes, inaccessible to the community.

Such studies not only inadvertently deny their consultants the ability to access their own traditional knowledge, but also implicitly value 'content' over 'form'—that is to say, the biological information, over the language that encodes that information. In recent years, however, there has been a significant emphasis in ethnobiological research on the return of TEK to local communities in a usable form. Notable examples include projects such as the People and Plants initiative jointly funded by the Royal Botanic Gardens in Kew, UNESCO and WWF; the Terralingua project, which seeks to promote biocultural diversity; and also individual researchers who aim to produce multilingual resources such as the Tok Pisin and English *Reite Plants* handbook [20].

Modern ethnobiological textbooks and field guides now regularly include a section on language—for instance, the useful introduction to basic linguistic concepts and methodologies in Gary Martin's *Ethnobotany* [21]. Similarly, a section in Fikret Berkes' *Sacred Ecology* draws the ethnobiologist's attention towards various linguistic issues that could confuse the task of data collection, and also warns against clinging on to one's own personal linguistic prejudices while conducting fieldwork [22]. More recent edited volumes such as Maffi [23] and Anderson et al. [24] contain comprehensive listings of articles that describe current efforts across the globe to protect and foster both linguistic and biological diversity.

Among field linguists, serious engagement with biological phenomena has been slow to manifest itself, although there are notable exceptions to this trend, such as Julie Waddy, Nicholas Evans and Murray Garde [25–27]. A reluctance to combine

the documentation of TEK and language appears all the more puzzling when one considers the many inter-disciplinary enterprises that have become commonplace in the traditional linguistic research agenda—investigations into cultural domains such as kinship, physical domains such as landscape and psychological/cognitive domains such as colour terminology and spatial representation, just to name a few. The new, but rapidly growing field of language documentation puts a great premium on the obtaining samples of different, culturally relevant speech genres [28], and I have argued [8] that documenting TEK is an ideal way in which to achieve this. Much has been written on the negative consequences of language death, and possible solutions to counteract it [29–31], as well as on the practice and method of language documentation [32, 33]. Of these, only the volume by Nettle and Romaine (briefly in a section on 'Indigenous Knowledge Systems, p. 166–167) and a chapter in Thieberger's *Handbook* [34] explicitly mention TEK. Traditional biological knowledge would arguably rank as one of the most important topics of conversation among members of non-industrialised communities; it could be claimed that kinship systems are talked about at least as much as biological phenomena in some societies, but it is hard to imagine a language community obsessed with discussing the colour of objects. Moreover, linguists are ideally placed to carry out ethnobiological research in collaboration with specialists in various fields of biology—the former, by virtue of attending to analyses of the formal grammatical features of language, and to the way meaning is created in context, have a better chance of avoiding the misunderstandings inherent in cross-cultural communication.

1.2 Language in Ethnobiology: A Classificatory Bias

'What is named, and how?' is one of the fundamental ontological questions of linguistics, and can be answered to a significant extent by a consideration of plant and animal names in a given language. Brent Berlin [9] has been highly influential in this respect, arguing in his monograph *Ethnobiological Classification* that there are predictable ways in which species get singled out for naming cross-linguistically, and also that there are regular patterns in the way these species are labeled (see Sects. 2.2.1 and 2.2.2 for a listing of the main points of Berlin's model). This is an important idea that clearly needs to be tested thoroughly via the collection and careful analysis of culturally-sensitive, contextualized ethnolinguistic data from a large number of unrelated languages. Berlin's ideas, developed over a period of around two decades, have proven so attractive and influential that the great majority of language-centric studies carried out in recent decades by ethnobiologists have been on the topic of folk classifications. Ford's [2] review of progress in ethnobiological research clearly shows that of the 218 articles published in the *Journal of Ethnobiology* since 1981, only a handful (26, or 12 %) could be said to discuss language-related issues, and of these, 19 focused entirely on folk classification. Although Berlin was careful to use phrases such as 'general principles' and 'empirical generalizations' while laying out the features of his theory (pp. 20–35), these

'general principles' have since come to be viewed largely as cross-linguistic universals, with Berlin himself embracing the use of the latter term [35]. Moreover, by insisting that ethno-classifications are "*largely immune from the variable cultural determinants found in other areas of human experience*" ([9], p. 9), Berlin has legitimized and propagated a view of language-based ethno-biological research, according to which it is perfectly acceptable—indeed, preferable—to restrict one's attention to the elucidation of taxonomic hierarchies of named organisms in a void bereft of most contextualising cultural references.

This is a great pity, for linguistic research on (non-classificatory) biological themes has time and again shown its potential to be of great interest and benefit to community members, and to workers in other professions (see [36], p. 20 for a review of some cross-disciplinary studies). Garde et al. [37] present, with extensive original language transcriptions, the Bininj Gunwok (Arnhem Land, Australia) people's knowledge of fire ecology and seasonal cycles, and their effect of living organisms. The inclusion of language material ensures that the knowledge and concepts of the speakers is transmitted with minimal alteration by the ethnographer or the analyst. At the same time, the fact that such research is seen to be a part of a co-operative effort between government research agencies, policy makers, natural scientists, linguists and indigenous peoples speaks volumes for the ability of language-based studies to document TEK, and disseminate it among multiple stakeholders.

The potential of language-based studies to uncover facts about the natural world that were, to that point, unknown to science has been repeatedly demonstrated—possibly the best known of these are the collaborative works by Saem Majnep and Ralph Bulmer [38, 39], which present fascinating accounts of the natural world from the point of view of the first author—a hunter, and speaker of Kalam, from the highlands of Papua New Guinea. The first contained a brief mention of the unpalatability and unpleasant consequences of eating the *wobob* bird (*Pitohui dichrous*) 15 years before it was reported by scientists as the first ever account of a bird with toxic feathers [40]. The second of these volumes provides frequent references to the Kalam term *abn* (glossed by Bulmer with the neologism 'undercroft'), which is an almost subterranean (in reality, it lies among the tree roots and decaying vegetable matter on the soil's surface) labyrinth of tunnels, which are home to small edible rodents—a world that was, until then, unknown to biologists.

Similarly, Evans [25] presents evidence from a range of Australian languages to demonstrate that polysemous flora–fauna terms can encode crucial ecological information that links together two species. This can include predation (a grasshopper and its preferred grass food have the same name), spatial collocation (a heron and the mangrove tree in which it nests), and temporal co-incidence (two species that regularly appear at the same part of the seasonal cycle). Linguistic data in the biological domain can also be used to reconstruct historical events [41] or even entire lost worlds (reviewed in Evans [36], Chap. 6). Notable examples in this regard include the outputs of the ongoing *Lexicon of Proto Oceanic* project [42, 43], which provide reconstructions of key plant and animal terms in an ancestral form of the Oceanic subgroup of the Austronesian language family, thereby providing a glimpse into the biological world of prehistoric humans from around 2000 BC.

1.3 Questions

In many ways, this book is a reaction to the research agenda set by the findings and predictions presented in Berlin, which, as noted in Ford [2], has led to a restriction of the scope of language-centred ethnobiological enquiry to names and classification schemes. The documentation of the indigenous names of locally-occurring plants and animals and the investigation of folk taxonomies is of course important, but as I have argued in [8], it is equally important to look beyond the lexicon, and to utilise the tools of field linguistics to uncover the great mass of encyclopaedic knowledge that native speakers associate with each item in their ethnobiological lexicon. The same can be said of the dense networks of relationships that people perceive as forming undeniable links between seemingly disparate named entities or phenomena.

1.3.1 The Ethnobiological Lexicon

I address issues of nomenclature and taxonomy early in the book, in order to focus on more holistic issues in later chapters. A basic, but important, question that relates to the lexicon is 'What is named?' while a logical second question might be 'How are named entities organised in a person's mind?' As is further discussed in Chaps. 2 and 3 of this book, Berlin places much emphasis on the perceptual properties of living organisms, predicting that those with striking morphology (bright colours, large size, or other features that make them 'stand out') will be the ones preferentially named by any language community.

Another key prediction made by Berlin is the universality, across human cultures, of ways of naming and classifying plants and animals. The reason for this, says Berlin, is that all humans possess the same cognitive capabilities, by virtue of which they should be able to detect the same form-based discontinuities in the biological world, and subsequently construct very similar classification schemes for living organisms. As evidence, he cites the experiment he carried out with American university students (further discussed in Chap. 2), who consistently arranged groups of unknown bird species in much the same way as the Huambisa and Aguaruna Jívaro people, on whose territories those birds were to be found.

Berlin's experimental results are certainly intriguing, but it is pertinent to ask what they really mean, and what conclusions may be safely drawn from them. A related claim is that when given a mixed set of names of plants and animals, subjects will invariably place the plants in one category, and the animals in a separate category, even if the subjects' language has no overt lexemes for 'plant' or 'animal'. This is meant to indicate the pre-existence of discrete 'plant' and 'animal' categories in the subjects' minds, which form the top nodes of the subjects' ethnobotanical and ethnozoological classification systems respectively. As an investigator approaching ethnobiology from a language-centric viewpoint, I would be interested to know whether a crucial element of Berlin's reasoning is supported by empirical

linguistic data: that the categories that subjects are *able to* construct in experimental situations because of shared human cognitive facilities really do represent the categories that they would *normally* make use of in their everyday interactions with their external environment (including other humans). In other words, do the people, who lack a 'plant' lexeme in their language, but can still discriminate between (biological) plants and animals when asked to do so, routinely make reference to the category of objects denoted by, say the English 'plant'?[1] Similar objections have been raised by linguists dissatisfied with their field's disproportionate emphasis on grammaticality, at the expense of naturalness. For instance, Pawley and Syder [45] have argued that while a formal grammatical analysis goes a long way towards explaining what can be said in a language, a proper understanding of the phenomenon of nativelike selection (i.e. selecting only natural and idiomatic sentences from the infinite utterances that the grammar allows) can only be gained through an investigation of phenomena such as 'lexicalised sentence stems', which give an indication of what native speakers actually say.

Parallel to the issue of a 'perceptual' explanation for human classificatory behaviour is the question of the role of 'culture' in the demarcation of named categories. There has been a resurgence of interest, in recent years, in detecting the presence of Whorfian (relativistic) effects in a variety of languages and semantic domains. Many psycholinguistic studies have compared the languages of different speech communities or of multilingual individuals to show that particular languages do indeed impose certain constraints on human perception, with both chronic (long-term) as well as "online" (short-term) effects [46–48]. Retuning to classifications, a 'perceptual' categorisation might motivate a person to discriminate between metal and wooden chairs (i.e., create two temporary, *ad hoc* categories) in the context of, say, deciding which bits of furniture should be placed outdoors, but one might expect a 'cultural' categorisation to be more stable because, by definition, it would be a categorisation learnt either from one's parents, or through formal education, or through regular interactions with other members of one's community. A good example of such a categorisation might be the highly culturally-sensitive judgements of substances or organisms deemed 'edible' or 'inedible' (or, perhaps more appropriately, 'appetising' vs. unappetising'). Tripe, blood, sago grubs, fish paste and blue cheese can be either delicious or revolting, depending on the cultural milieu within which the investigation on edibility is carried out. It has been argued that a category that comprises 'edible' substances is formed very early in an infant's life [49], but can the same be said for categories that manifest themselves in experimental situations, but subjects do not have a linguistic label for? Berlin claims that utilitarian and other cultural factors account for very little of the structure and content of a folk classification, as the perceptual features of the organisms included in a classification are the main determinants of the ways in which they are categorised. In Chap. 4, I test this generalisation through a consideration of Solega bird names, and ask whether perception really does play a much more important role than culture.

[1] Another pertinent issue at this point is whether the semantic ranges of the biological term 'plant' and the vernacular 'plant' labels in different languages really do overlap, and if not, what the differences are (see [44], p. 315 for further discussion).

Another reason to be suspicious of the assumption, that a category that *can be* created is a category that *is normally* relevant in real-life situations, is the mass of evidence from controlled psychological investigations on category formation, learning and use. Much of the literature dealing with the flexibility and context-dependence of mental concepts dates to the 1980s and early 1990s, i.e., around the time when Berlin's *Ethnobiological Classification* was published. The psychologist Lawrence Barsalou has written a series of influential papers on the topic of flexible categories, arguing, for instance, that while "*different people* [in a speech community] *store very similar information for the same category in long-term memory*… [the] *tremendous flexibility that we have seen in… experiments arises not from differences in knowledge, but from differences in the* retrieval *of this knowledge* ([50], p. 34). This flexibility further manifests itself in the way people construct and use *ad hoc* categories comprising "*highly specialized and unusual sets of items*" ([51], p. 211) to meet short term goals, such as planning future activities. Such categories share some properties with 'common' (i.e. long-term) categories, but differ in that the former are not well established in memory, and show high inter-subject variability in the absence of a context. By way of explanation, Barsalou theorised that:

> Because ad hoc categories are so specialized, it may be optimal that perceiving an entity does not activate all the ad hoc categories to which it belongs. Seeing a chair and having categories such as "emergency firewood", "fits in the trunk of a car" and "used to prop doors open" come to mind would be highly distracting when these categories are irrelevant. Ad hoc categories should come to mind only when primed by current goals. (p. 223)

In a recent book chapter, Barsalou et al. [52] make a strong case for the inclusion of context in psychological research (as well as other domains of academic investigation). The authors point out that there is an overwhelming amount of evidence clearly demonstrating context effects on diverse phenomena, but more importantly, that taking context into account usually explains much of the variation present in data. Many theories claim that expert performance is more the result of simple pattern matching rather than reasoning, say the authors, and that the former is facilitated by storing situation-specific chunks or exemplars in long-term memory. Unfortunately, many psychological concepts are routinely tested and modelled in experimental situations where variation is ignored or treated as psychological noise, or where the context is strictly controlled to minimise variability [53]. In psychological studies on concepts and categories, in particular, there tends to be an assumption that categorization is primarily a bottom-up, stimulus-based process [54], whereas in reality, humans show variable categorisation behaviour depending, among other factors, on the situation or task at hand [51, 55], expertise [56] or language repertoire [57, 58].

A major implication of the preceding discussion for research on ethnobiological classifications is that the methods by which folk taxonomies are investigated (i.e. semi-structured interviews, sorting, grouping and identification tasks) may in fact represent but one type of context, within which one type of categorisation scheme can be obtained. Such a 'standard' Folk Taxonomy of X Group of Organisms in Language L carries with it the risk of not faithfully representing other, legitimate ways people may have of thinking about X, by virtue of having been elicited in

a situation freed from the usual contexts that speakers of Language L might encounter on a regular basis. Indeed, the possibility that such taxonomies may well be artefacts of the analyst's mind has been raised by several authors [14, 59, 60]. I discuss the issue of methodology further in Sect. 1.4.

In their introduction to a study on the organization of food categories by English speakers, Ross and Murphy [61] made a similar observation: namely, that earlier psychological work on the classification of real-world concepts had "*often suffered from three limitations: a single hierarchy, a single function, and isolated knowledge*" (p. 496). This means that researchers often ignore the various cross-classifications that named entities may belong to, assume that classification is the only function for which concepts are used (while ignoring other functions such as induction, explanation, problem solving, category formation and communication), and focus on a certain kind of knowledge in isolation from much of the other knowledge that humans possess. Ross and Murphy presented their subjects with a long list of foods, and asked them to generate the categories that those foods belonged to. The researchers found that subjects were just as likely to create 'script categories' (categories that usually made reference to the time or situation when the food was eaten, or to the healthiness of the food), as they were to name standard 'taxonomic' categories, such as breads, meats, etc. The authors distinguished between script categories from Barsalou's ad hoc categories which, in the context of food, might include 'foods that are often cooked in water' or 'foods that squash easily'. Next, subjects were divided into three groups, and asked to sort the same food categories according to (a) taxonomic groupings, (b) script groupings, and (c) and any criteria the subjects found appropriate. Groups (a) and (b) produced groupings in line with their instructions, but although group (c) produced predominantly taxonomic groupings (56 %), a significant proportion (30 %) of their groupings were still along the lines of script categories (e.g. junk foods, breakfast foods). Interestingly, even in group (a), 22 % of the groupings were script categories, in spite of strict instructions to the contrary. Finally, the authors found that both script and ad hoc categories showed large priming effects, in that the presence of contextual information could motivate subjects to place items into these categories. Script categories could be spontaneously activated by the presentation of a food item, although this activation was not as strong or as consistent as that of the taxonomic categories.

How might these results relate to folk biological classifications? First, they show that it is quite normal for people to have more than one way of categorizing objects that they regularly interact with. Such alternative categories may exist long-term, and therefore be as perceptually salient as the more conventional, taxonomic categories. More importantly, they suggest caution while positing 'covert categories' (folk taxa that are not named, but that are often grouped together in sorting tasks; Berlin, 1992, pp. 139–160) as legitimate nodes in folk classifications. Naturally, such taxa would be valid if speakers were to consistently, and spontaneously, say that certain organisms 'belong together', or if there existed certain complex expressions in the language that made reference to an unnamed category. In the absence of such supporting information, however, it would be reasonable to regard covert categories with suspicion, as they could well be equivalent to the script categories or ad

hoc categories described earlier.[2] This applies not only to covert groupings of 'folk generics' (which Berlin labels 'intermediate taxa'), but also to 'kingdom' level groupings, which are usually unnamed across languages. Ross and Murphy (1999) provide an illuminating example to demonstrate their point that highly specific contexts may motivate the construction of novel categories:

> For example, one may not have a well-established category of foods eaten at the movies, but one can easily construct such a category post hoc, including popcorn, soda, certain candies, and ice cream. If one often eats at the movies, this information may become more and more saliently represented for these items, until it can be as important a way of representing them as their taxonomic categories. (p. 540)

'Often eating (e.g. popcorn) at the movies' is reminiscent of the 'activity signatures' that Hunn [62] suggested as being of value in gauging the utilitarian significance of a particular plant or animal. Unfortunately, although covert categories such as 'doves' or 'birds of prey' [63] are frequently allowed on the basis that certain names tended to clump together in free recall lists, researchers seem to be dismissive of utilitarian groupings of species offered by speakers, such as 'plants that bear edible greens', or 'birds with (useful) ornamental feathers'. Berlin argues that such culturally-based covert categories are rare, and that they *might be better described as part of a cross-cutting system of classification*" (p. 152). Priming is a relevant phenomenon in such cases, as speakers may first categorise those taxa which can be grouped primarily by their morphological characteristics, and continue to use the same criterion to create subsequent groupings on an ad hoc basis. As a result, groupings based on utilitarian factors may be under-represented or missed altogether. The context of an elicitation session is also a highly unnatural one, in contrast to speakers' normal interactions with the plants and animals that the ethnobiologist wishes them to categorise. In the absence of the usual contextual cues that would normally accompany the categories being focussed on, speakers could effortlessly and unconsciously resort to whatever cues do remain in the task at hand. These would invariably be morphological cues, and could just as easily be the only cues available to a speaker in a name or specimen sorting task, or a free-listing task.

For such reasons, I have tried to avoid presenting formal Solega folk taxonomies of any group of organisms in this book, unless such a taxonomy was strictly necessary to make a point. Instead, I investigate some key assumptions that underlie Berlin's general principles, chief among these being certain misconceptions about the nature and practice of biological classification, as carried out by professional taxonomists. In Chaps. 2, 3 and 4, I also examine many other claims made in Berlin [9], including those relating to nomenclature, and to the different levels of the hierarchy of a given ethno-classification system.

[2] Ross and Murphy [61] did not present strict criteria to distinguish between these two types of categories, and it is possible that the difference is simply a matter of frequency of usage, with ad hoc categories only being used in very limited contexts. Another way of stating this would be that certain, very specific, kinds of contextual information are required before an ad hoc category is activated.

One way to ensure that folk taxa are described in ways that are relevant to the speech community is to ensure that the context of classification is not ignored. In Chap. 2 for instance, I argue that the classification of culturally important organisms such as honeybees and mushrooms only makes sense in the context of their patterns of use, while in Chap. 4, I show that the (socio)linguistic context has a bearing on the way birds are named, both in structured tasks, as well as in spontaneous discourse. Yet another way to ensure that culturally-significant and linguistically-relevant information is not disregarded is to make 'context' itself the object of study. Many themes discussed in this book, especially in the later chapters, have little overt connection with folk classification, as it seemed not only interesting, but also important, to investigate the encyclopaedic knowledge that Solega speakers associated with each named organism or natural phenomenon, as well as the knowledge of the relationships linking these organisms and phenomena. In doing so, I hope to move away from a taxonomy-centric paradigm of linguistic ethnobiology, and give traditional ecological *knowledge* the recognition it deserves to get from those who would study human language.

1.3.2 Analysing One 'Context'

The possibility that the context of an ethnobiologist's investigations (e.g. the experimental task) could result in the formation of short-term ad hoc categories has already been discussed above. This would be an example of an artificially imposed context leading to the creation of possibly artificial (from the speech community' point of view) folk taxa. It seems reasonable to assume, then, that a sound appreciation of the complexities of a community's TEK can only be gained by also studying the long-term contexts within which the knowledge is embedded, learnt and used. Such contexts are numerous and inter-related, and might include the community's geographical location (and accompanying biodiversity), cultural institutions and practices, linguistic history, migration history and history of contact with other communities, to name just a few. The study of each of these topics is deserving of an entire research project, and is understandably outside the scope of this book.

One context-providing topic that I did manage to investigate during my field research, and that arguably has the most direct bearing on TEK, is the Solega conception of the numerous landscape and forest types for which they have names. The physical landscape and the ecosystems, within which various named plants and animals are to be found, are likely to have a significant impact on Solega conceptions of those organisms. Accordingly, in Chap. 5, I investigate the features that Solega speakers attribute to each landscape or forest type, in order to determine exactly how plants and animals are linked to their environment.

I mentioned earlier the very likely prospect that Solega people view plants and animals not as isolated species, but as nodes that support a dense web of ecological interactions. Might this way of perceiving named entities also exist on a much larger scale, namely that of the entire landscape? In other words, is it possible that named

ecosystems (i.e., forest or landscape types) are also linked, in the minds of the Solega, by a network of processes and interactions? The primary data on which the investigations of Chap. 5 are based are not completely naturalistic, as they were elicited through interviews. This is not a problem, however, as long as the limitations of data gathered under controlled conditions are fully acknowledged. In this case, the major limitation is that people would be prompted to explicitly provide information that would otherwise be completely implicit in everyday social discourse. Again, this does not invalidate my study, because the primary aim is to ask "What do Solega people know about landscape X?"—here, it is the Solega speaker's corpus of implicit encyclopaedic knowledge that is the object of inquiry.

In contrast, caution would be well-advised in the case of *how* questions, such as "How do Solega people perceive the interconnectedness of different ecosystems?" I do ask such a question later in the chapter (summarised in the following paragraphs), but this question is partly answered by means of supplementary information gained from unstructured Solega narratives, where the speakers were free to choose the direction in which the narratives progressed. The theoretical limits of a Solega conceptual system (here, the 'cognitive map') are therefore first established through the data gained from interviews, while the more spontaneous data provide glimpses into how the system is actually utilised in socially acceptable ways in everyday discourse.

The concept of a 'mental map' or 'cognitive map' has been thoroughly investigated by a wide range of professionals, including neuroscientists, psychologists, investigators of artificial intelligence, cartographers and city planners. In spite of this attention, the very definition of a cognitive map, as well as the ways in which such a 'map' might represent knowledge of the external world, remains contentious, possibly as a direct result of the great variety of theoretical orientations among those who investigate such phenomena.

The question of which viewpoint is psychologically more dominant still remains largely unresolved, and Kitchin [64] proposes that the term 'cognitive map' should be used in a utilitarian way to "*represent the knowledge of, and interactions with, the everyday environment, and geographical information gained through other secondary sources such as* [man-made] *maps*" (p. 5). While describing the semantic ranges of the various Solega forest and landscape terms, I periodically address the question of what Solega people know about the components of these places, and how they interact with them. Here, it also seemed relevant to ask, "What is the nature of the Solega cognitive map?" and "How does the cognitive map interact with the Solega's encyclopaedic knowledge (see Sect. 1.3.4 below) of the entities and phenomena situated within the landscape?"

1.3.3 Incorporating Variation

I mentioned earlier the criticism levelled by Barrett et al. [53] at psychological experiments that either ignore variation, or seek to minimise it. Normal language use is also characterised by "*variability of a structured and regular kind*" ([65], p. 340),

and this variability can take the form of (at least) phonological, syntactical and lexical differences between individuals [66]. It would be unsurprising not to find variation in folk taxonomies or TEK either between individuals or sub-communities of a language group; indeed, there have been notable ethnobiological studies that have primarily investigated variation in TEK as a function of different social variables [59, 60, 67, 68]. It is precisely because of the existence of (often widespread) variation that a folk taxonomy, which only illustrates one way of categorising organisms, should be regarded as an idealised abstraction, rather than a representation of how people really think. As Labov [66] points out:

> The existence of variation and heterogenous structures in the speech communities investigated is certainly well-established in fact… Each investigator feels that his own community has been corrupted from this normal [i.e. variation-free] model in some way—by contact with other languages, by the effects of education and pressure of the standard language, or by taboos and the admixture of specialized dialects or jargons. But we have come to the realization in recent years that this is the normal situation—that heterogeneity is not only common, it is the result of basic linguistic factors. (p.203)

In this book, I have made a conscious effort to take note of inter-individual or inter-community variation in Chaps. 4 and 5. In Chap. 4, I ask whether certain concordances between my data and Berlin's predictions regarding nomenclature at the 'folk generic' level of classification truly do reflect a pattern that pervades the entire speech community, or whether there is significant variation in the choice of lexeme(s). A baseline level of dialectal (phonological) variation is, of course, to be expected, given that the Solega live in several villages that can be several kilometres away from one another. My interest lay in documenting variation at the lexical level, where certain organisms might be known by completely different names by different individuals, or where the combinatorial patterns of a given lexeme (for instance, in the formation of compounds) might diverge.

1.3.4 'Encyclopaedic Knowledge' as an Object of Study

There have been calls from linguists for some time to extend the boundaries of linguistic research, in order to incorporate phenomena that were once regarded as extra-linguistic (e.g. [69]). Supporters of Cognitive Grammar have been influential in this respect, as evidenced by their incorporation of the notion of 'encyclopedic knowledge' into their theory. Arguing that "*no clear and nonarbitrary dividing line can be drawn between linguistic knowledge and world knowledge*" [70], cognitive grammarians advocate semantic analyses which fully acknowledge the role of pragmatics in shaping the meaning of utterances ranging from words to complete sentences. Similarly, among ethnobiologists, Ellen [71] has argued "*that all classifications are discursive practices situated in a given social matrix and general configuration of knowledge and ideas… and that they are products of specific histories.*" The study of the Solega "*social matrix*" lies well outside the scope of this book, but in Chap. 6, I have made an effort to elucidate some of the main features of the "*general configuration of knowledge and ideas*" within which named Solega