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Sociolinguistic Studies

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Sociolinguistic Studies is the new title of *Estudios de Sociolingüística*, a journal founded in 2000 at the University of Vigo (Galicia, Spain) which offers a linguistic and cultural bridge between sociolinguistic research in the Romance world – especially the Spanish and Latino-American world – and the English-speaking research community.

All articles in *Sociolinguistic Studies* are peer-reviewed and may be in English, Spanish, Galician, Portuguese, French or Italian (90% of the contents are in English). It takes an ecumenical approach to the different schools, methodological principles or research orientations within sociolinguistic research and also accepts contributions from related fields such as pragmatics, discourse analysis, conversational analysis, interactional linguistics, language acquisition and socialization, linguistic anthropology, ethnomethodology and the ethnography of communication. Papers may examine any issue in sociolinguistic research including, but not limited to, styles and registers, communicative situations and speech events, politeness, bilingual conversation and code-switching, gender and discourse, language attitudes, language ideologies, the diversity of the worldwide linguistic situation, bilingualism and multilingualism, diglossia, pidgins and creoles, language and culture and language and identity.

The recent boom in the field of studies on bilingualism (to which our university has contributed by holding two international symposia, at 1997 and 2002) leads to the assumption that the problems and phenomena labelled as ‘bilingualism’ are a promising area of encounter between psycholinguists and sociolinguists. This has, in fact, been outlined in foundational sociolinguistics, apart from being extremely interesting for the development of language theory itself. We shall be devoting considerable attention to this in the pages of *Sociolinguistic Studies*, both from sociolinguistic, psycho-sociolinguistic, pragmatic-conversational, educational, planning oriented and sociopolitical points of view.

Sociolinguistic Studies also pays special attention to minority language and cultures, language contact and change, language maintenance, shift and loss, language and social inequalities and language planning and policy.

The journal publishes substantial research papers, discussion notes, reviews and review articles and regularly publishes thematic issues.

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Ethnobotany: Plants, people and languages

Guest Editors: Robbie E. Hart (William L. Brown Center, Missouri Botanical Garden, United States), and K. David Harrison (Center for Environmental Intelligence, VinUniversity, Vietnam; Center for Plants, People and Culture, New York Botanical Garden, United States)

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Introduction: Languages and plants together promote planetary health

Robbie E. Hart^a and K. David Harrison^b

Abstract

We are pleased to present this special edition of *Sociolinguistic Studies* devoted to the triadic relation among people, the plants they rely upon and nurture, and the languages they speak. Given the current global recognition of threats to biodiversity, and of the language extinction crisis, it is fitting that a leading sociolinguistics journal should explore how languages reflect human adaptation and coexistence with plants. Renewed attention to the nexus of these two diversities, and a way of working that includes and centers Indigenous and local authors and perspectives will be key tools in addressing the intertwined threats to the diversity of both plants and languages. The articles in this issue invite us to visit locations as diverse as Mexico, Mongolia, Siberia, Vietnam, and Vanuatu. In all these places, and many more, we can witness the ways in which people talk about, perceive, use, and foster plant biodiversity to the benefit of the entire planet.

Keywords: biodiversity, endangered languages, ethnobotany, indigenous science, Mexico, Mongolia, Siberia, Vietnam, Vanuatu

1 Special issue on Ethnobotany

The relation between people and plants is the foundation of a healthy planet. It is mediated by language and can only be adequately understood by prioritizing local and Indigenous perspectives, as the papers in this issue demonstrate. As

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scholars trained in anthropology, botany, ethnobotany, and linguistics, we see great potential for deeper interdisciplinary collaborations to scientifically document the world's flora in synergy with Indigenous plant knowledge.

The current trajectories of both language diversity and plant diversity are cause for concern and, given that the fates of the two are intertwined, merits urgent action. The world's nearly 7,000 indigenous languages face unprecedented pressures. If current trends continue, it is estimated we will lose one language every month for the next 40 years (Bromham, Dinnage, Skirgård, Ritchie, Cardillo, Meakins, Greenhill, and Hua, 2022). *Ethnologue* (Eberhard, Simons, and Fennig, 2024) classifies 34% of the world's languages as endangered, while scientists note with alarm that 'languages are vanishing at a rate that rivals our biodiversity crisis' (Skirgård et al., 2023). Linguists' collections, deposited in print or digital dictionaries and language archives, cannot replace living speech communities, although they preserve a valuable record of diverse knowledge systems.

The extinction rate of plants – which account for over 80% of earth's total biomass (Bar-On, Phillips, and Milo, 2018) – is accelerating dramatically. The *State of the World's Plants and Fungi 2023* report found that over 60% of the world's plants are now threatened with extinction, a huge jump from the estimated 20% in the 2016 version of that same report. Among the approximately 100,000 vascular plants that scientists estimate as yet to be described and named as new to science, upwards of 75% are threatened with extinction (Antonelli et al., 2023: 69). Collections for research and *ex situ* conservation deposited in herbaria and seed banks will not replace living ecosystems nor reverse the extinction trend, even though they preserve a valuable record of (past) biodiversity.

A global spatial association between areas of language richness and plant richness is connected to this intertwined threat. As Gorenflo, Romaine, Mittermeier, and Walker-Painemilla (2012) note, 'biodiversity hotspots and high biodiversity wilderness areas [...] often contain considerable linguistic diversity, accounting for 70% of all languages on Earth'. They call for 'developing integrated strategies designed to conserve species and languages in regions rich in both'. Further evidence for 'congruence between patterns of diversity in the distribution of species and languages' is presented by Loh and Harmon (2018). They note that while efforts to document species and languages are synergistic, this requires cross-disciplinary teams such as those represented in this issue:

If biodiversity conservation organizations on the ground in areas of high bio-cultural diversity were to invest resources in the conservation of indigenous languages and traditional knowledge there would be a double pay-off. Field linguists working on indigenous languages often lack the ecological knowledge

needed in order to understand and translate the vast lexicon of terms for species and natural phenomena. Field biologists could benefit from the immense wealth of traditional ecological knowledge of indigenous people. (Loh and Harmon, 2018: 679)

Languages and plants connect in myriad ways, but especially within the world-views and plant-based lifeways of Indigenous peoples. Around 25% of the world's labor force is employed in agriculture (Roser, 2023), interacting with plants on a daily basis. In healthcare, it is estimated that as much as '80% of the world's population [...] living in the developing world rely on herbal medicinal products as a primary source of healthcare and traditional medical practice [...]' (Ekor, 2014: 177). Indigenous peoples possess deep knowledge of floral biodiversity and its multiple practical uses that support health and well-being. As Hällzon, Ötkür, Ståhlberg, and Svanberg (2024: 2) observe:

Human-plant relationships generate many biocultural domains. Archaeological, ethnobiological and ethnographical research worldwide demonstrate that plants and plant materials have been utilized by humans for a wide range of purposes during millennia, such as producing textile fibres, equipment, dwellings, animal feed, colorants, cosmetics, fuel, dyes, food, hygienic products, attractants, pesticides, poisons, remedies, repellents and stimulants.

Particularly when associated with utility or other human-plant relationships (including aesthetics, spirituality, time reckoning, wayfinding, etc.) rich vocabularies of plant names can be found in local and Indigenous languages and language varieties (Hunn, 1982). These vocabularies can often indicate plant uses, ecological or lineage relationships among plants, seasonality, habitat, connections to human history, and religion (Harrison, 2007; Osorova, Malysheva, and Zamorshikova, this issue; Stringer, this issue). These linguistic repertoires or vocabularies are inseparable from surrounding cultural contexts, interwoven amid holistic concepts of Indigenous and local ecological knowledge structured by land, language, and reciprocal relationships (Salmón, 2000; Peemot, this issue). Given this, it's no surprise that Indigenous peoples regard their languages as a source of pride and identity, as well as cultural heritage and intellectual property. Many of these languages are marginalized, poorly resourced, and increasingly endangered. They are also the focus of language revitalization and cultural preservation efforts by their speakers (Treuer, 2020; Ramos-Bierge, Pacheco Salvador, Carrillo de La Cruz, and McAlvay, this issue), with mixed success.

Both natural history collections and language archives may hold valuable information about the nexus of these two fields, often not recognized, obscured or uncured, or unavailable to scholars or communities. Linking

these resources and ensuring best practices in their interdisciplinary collection thus offers an opportunity both for scholarship and for language revitalization efforts. However, as Ramos-Bierge, Pacheco Salvador, Carrillo de La Cruz and McAlvay point out in this issue, this must be done with attention also to best practices around intellectual property and with attention to the unique context of each community.

2 Case studies

The papers in this special issue bring into focus the triadic relation among people, the languages they speak, and the plants they rely upon and nurture. The eight author teams here include linguists and biologists; speakers of endangered languages as well as languages of global communication; scholars, community members, and practitioners of language revitalization. While their topics are diverse, together they elucidate some key concepts that multidisciplinary perspectives and Indigenous communities contribute to our understanding of this domain.

In Mexico, Stefanie Ramos Bierge, Gabriel Pacheco Salvador, Tutupika Carrillo de la Cruz, and Alex C. McAlvay ('Data sovereignty and community engagement at the intersection of language and ecological knowledge: Lessons from two Wixárika (Uto-Aztecan) communities') describe how attention to data sovereignty and community engagement can help projects document and simultaneously meet the goal of collective benefit, authority to control, responsibility to community, and ethics (CARE principles, as framed in Carroll, Herczog, Hudson, Russell and Stall, 2021). In the Wixárika cultural context, this required harmonizing data access with community understandings of decision making and redesigning project outputs based on community consultation to create better usability by including touchable, listenable, and dynamically modifiable records.

From a global perspective, David Stringer ('Folkbiology in endangered languages: Cognitive universals and lexical relativity') offers a broad framework to underscore the valuable point that explorations of diversity not only help to understand and conserve individual cases but also can help us understand what is possible. In complementarity with focused case studies such as Osorova, Malysheva, and Zamorshikova (this issue), this shows that the way languages classify the environment (whether broadly shared patterns or exceptions) help us better understand human cognition and the ways we can comprehend and speak of the world around us. Stringer also argues that truly collaborative work has the promise to go beyond providing more data to offer 'a paradigm shift, so that, for example, collaborative linguistic work should have at its heart Indigenous needs, goals, values and cultural norms (Leonard, 2021)'.

In Vanuatu, Gregory M. Plunkett, Michael J. Balick, Presley Dovo, Jean-Pascal Wahe, Reuben Neriam, Neal Kelso, Dominik M. Ramík, Nadine Ramík, and K. David Harrison ('Message plants of Southern Vanuatu') demonstrate that collaborative work between botanists, linguists, and local and Indigenous experts and knowledge holders sheds light on the rich relation people have with plants, which exceeds basic nutritional or medicinal use. Inhabitants of Aneityum and Tanna islands employ plants for symbolic use as personal adornment and to convey diverse and very specific semantic messages. They also use plants to reckon time in their ecological calendars (Balick et al., 2023), and in weather magic (Balick, Harrison, Kelso, Neriam, Noar, Plunkett, Ramík, and Wahe, 2022).

In Vietnam, Tuyen Dai Quang, Quyen Thanh Dao, and Hoang Van Nguyen ('Planting seeds for the future: Challenges and solutions for Cham traditional medicine in the context of Vietnam's rapid modernization') show how the Cham people devote countless hours of skilled labor and intellect to the collection, preparation, and distribution of medicinal plants. The Cham manage to do this despite suffering social discrimination and negative stereotypes. Ethnobotanist Tuyen and coauthors paint a distressing yet hopeful portrait of the Cham as a resilient people who not only sustain themselves but also heal others with their plant expertise.

Also in Vietnam, Trần Hoài, A Bên, A Hung, Đỗ Trường Huy, and K. David Harrison ('Baskets of wisdom: Bahnar basketry, folk taxonomies, and the maintenance of upland environmental intelligence in Vietnam') show that the Bahnar people of the Central Highlands regard the forest as sentient and home to myriad spirits. From the forest, the Bahnar collect rattan and at least fifty other plants in a sustainable manner to create cultural keystone objects including baskets, canoes, and the ceremonial *Rong* house (Trần, Harrison, Hoàng, and Cao, 2024). The complex process for creating these objects is transmitted mostly orally via the Bahnar language but also via visual-tactile and other sensory modalities. A Bahnar basket, canoe, or house is thus a vessel for plant knowledge transmission, and its plant composition also tells a story about the state of the forest ecosystem.

In the Tyva Republic (Russian Federation), Victoria Soyan Peemot ('The relational plant: *Spiraea Söösken* among the Tyva pastoralists') demonstrates the dense relational networks that are a common feature across Indigenous and local community interaction with the environment. The author explores how Tyva pastoralists respect and honor one particular plant called *söösken* (meadowsweet, several species in the plant genus *Spiraea*) and also view plants in general as intermediaries between sentient landscapes and cultural keystone

animal species, especially horses. She notes that Tyva pastoralists understand plants ‘as respected beings which communicate between sentient superordinate homelands and human-nonhuman communities’. The Tyva language contains an abundance of plant names as well as myths, wise sayings, songs, and stories that describe useful plants.

In Mongolia, Badarč Bayarsaikhan and Karl Dolgoržav (‘Medicinal herbs, their names and uses among the Tsengel Tyva people in Mongolia’) explore the vital importance of medicinal and edible herbs among the Tsengel Tyva People. They documented 19 plants that have both cultural significance and healing power. They note, however, that ‘this knowledge is at risk of being forgotten among the young generation partially due to migration to the cities and changing habits related to food and medicine use’.

In the Republic of Sakha (Russian Federation), Marina Osorova, Ninel Malysheva and Lyudmila Zamorshikova (‘Cognitive models used in the naming of plants in Yakut’) explore cognitive mechanisms used in the Yakut language for naming plants. The 53 Yakut phytonyms they document encode characteristics of 16 plants such as appearance, smell, location, and medicinal efficacy. They conclude that ‘[e]ach language of the world’s indigenous peoples is a unique reservoir of medical knowledge, thanks to which it is possible to identify and preserve the contribution of nature for the benefit of people’.

3 Conclusions

If humanity can manage to keep (or even just slow the rate of loss of) language diversity and plant diversity, we will reap benefits on both local and global scales. Healthy environments where plants flourish and humans thrive are supported by traditional knowledge systems about plants that are encoded and transmitted in local languages. A significant portion of this knowledge relates to medicinal uses of plants (Cámara-Leret and Bascompte, 2021) and thus its persistence directly supports human health. Likewise, diverse place-based knowledge of edible plants supports local food diversity, and the documentation and promotion of this knowledge in sustainable and equitable ways promises to strengthen global understanding of food diversity, which still has extensive gaps (Jarvis et al., 2024), and ultimately to support food security. Knowledge of plant harvesting and management is also linguistically encoded and plays a key role in integrating local and Indigenous communities into effective conservation and restoration initiatives that are among the paramount biodiversity challenges of our generation (Deur and Turner, 2005; Reyes-García, Fernández-Llamazares, McElwee, Molnár, Öllerer, Wilson, and Brondizio, 2018). But this

vast knowledge base is eroding. Supporting the survival of traditional knowledge systems requires documenting what diversity remains – of both languages and plants. It will require the joint efforts of botanists, linguists, local experts, and many others. The work will be most impactful when it fully includes local, traditional knowledge of plants in local languages. The papers in this edition make a modest contribution, while also inspiring and challenging us to do more. There is much in the languages and plants connection yet to be explored.

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Data sovereignty and community engagement at the intersection of language and ecological knowledge: Lessons from two Wixárika (Uto-Aztecan) communities

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Abstract

Indigenous languages and ecological knowledge are tightly interwoven and have been eroded in tandem in many parts of the world. To bolster or revitalize this cultural heritage, many Indigenous Peoples have worked with linguists and/or ethnobiologists, either from within or outside of their communities. Despite an increase in interdisciplinary projects at the intersection of these fields, there has been a limited exchange of best practices, ideas, and resources related to ethical and effective work with communities. Two areas where linguists and ethnobiologists have been innovative in parallel are *data sovereignty* and *community engagement*. While linguists often deposit data in large centralized archives with different levels of access to respect community preferences, equivalent archives, and graded access capabilities for ethnobiology are less common. At the same time, ethnobiologists have been experimenting with Traditional Knowledge Labels and

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Biocultural Labels to ensure that community preferences for information use accompany the data. For community engagement, tools such as 'linguistic landscapes' would be easily translated to ethnobiological projects, and community natural history collections could be synergistic with linguistic projects. Linguistics and ethnobiology share significant overlaps not only related to the classification and encoding of biological knowledge as well as in the need for methodologies that foster ethical engagement with local communities. Cross-communication between the two disciplines may lead to mutual benefit. In this paper, we outline approaches taken to address these issues by both fields, examine opportunities for mutual enrichment, and share experiences from our project with two Wixárika communities in West-Central Mexico.

Keywords: data sovereignty, community engagement, language and ecology, Wixárika, Uto-Aztecan, Mexico

1 Introduction

The rapid and interconnected erosion of indigenous languages and ecological knowledge has been met with a wide range of approaches to document, foster continuity of, and revitalize this cultural heritage. In recent years, interdisciplinary projects at the intersection of ethnobotany and linguistics, in collaboration with Indigenous communities, have emerged to achieve these objectives. The proliferation of these projects has coincided with a growing emphasis on ethical relations between researchers and communities. However, research that spans multiple fields presents unique challenges as these fields have their own respective standards, cultures, and infrastructure. At the same time, there are opportunities for mutual enrichment, as both fields focus to some extent on the preservation and revitalization of cultures, and involve close work with Indigenous Peoples and local communities. In this paper, we aim to demonstrate these challenges and opportunities by drawing on examples from our own project, *The Language of Land and Life*. This project aims to document and encourage the continuation of the threatened semantic domain of ethnobotanical and ethnoecological knowledge in Wixárika, also known as Huichol, an endangered Uto-Aztecan language (Dakin, 2004) in West-Central Mexico (Figure 1).¹

We focus on two themes that we see as important to our project, as well as central to ongoing discussions in the fields of ethnobiology and linguistics: *data sovereignty* and *community engagement*. The aim is to discuss how ethnobotany and linguistics have managed data sovereignty and community engagement, share our experience with the project, and explore how the fields can learn from each other to ensure best practices in transdisciplinary and monodisciplinary projects.



Figure 1. Wixárika communities (modified from: www.odapi.org).

The Language of Land and Life project, a three-year project funded by the US National Endowment for Humanities, is a collaboration between native-speaker language activists,² an ethnobotanist,³ a linguist specialized in Wixárika,⁴ a botanist,⁵ universities,⁶ and students.⁷

Our research centers on two Wixárika communities: *Xatsitsarie* (Guadalupe Ocotán) and *Tiwetia* (Cerro de los Tigres), both located in the Mexican state of Nayarit (Figures 2 and 3).⁸ These communities were selected due to the relative lack of documentation on the Wixárika ethnobotany and linguistics in the state of Nayarit, compared to Jalisco, which has been the primary focus of most Wixárika linguistic and ethnobotanical research to date.⁹



Figure 2. *Xatsitsarie* (left) and *Tiwetia* (right).

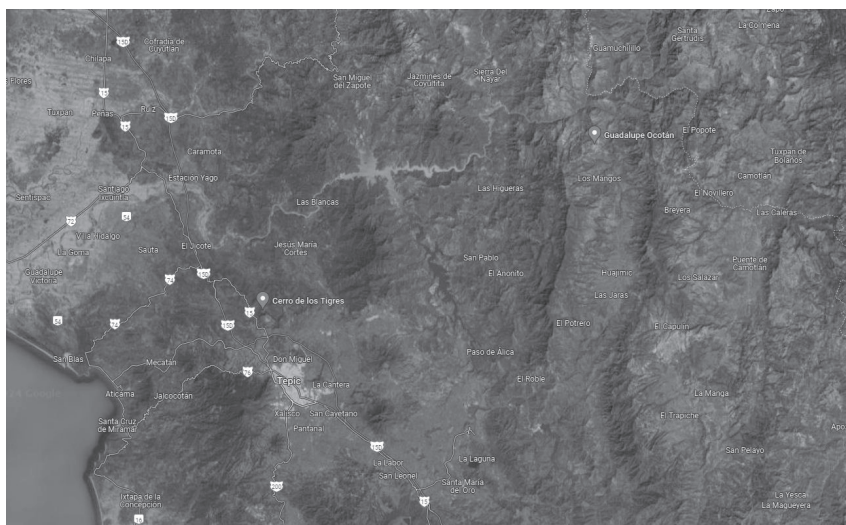


Figure 3. Location of the two Wixárika communities in our project (Nayarit, Mexico) (Google Maps).

This effort aims to generate four products: (i) a website with a searchable Ethnoecological and Linguistic Database and a physical ethnobotany handbook; (ii) an annotated audiovisual corpus of texts that will be deposited at the Endangered Languages Archive (ELAR) in Berlin-Brandenburg Academy of Sciences and Humanities; (iii) a body of pedagogical materials accessible to the Wixárika language community, including videos from ‘Voces del Gran Nayar’, a project by coauthor Tutupika Carrillo de La Cruz; and (iv) the revitalization of Plants, Animals, Words (PAW) – a collective focused on fostering interdisciplinary collaboration between those working at the intersection of language and biota.¹⁰

The methodology used for this paper began with direct consultation with the members of these two communities, aiming to present the project and determine their interests and specific needs. Both communities expressed their concerns regarding the potential misuse of collected information and emphasized the importance of community involvement in the process. Subsequently, the project members worked to align objectives and expectations. A review of the data sovereignty practices and community engagement of each discipline was conducted, allowing for the identification of areas of overlap and possible innovation. Finally, through the exchange of current practices between disciplines, the team was able to develop concrete proposals that reflected this collaborative process.

The structure of the paper is as follows. In §2 and §3 we present a summary of the history of thought regarding data sovereignty and community engagement by ethnobiology and linguistics, examine solutions provided by

each field, and discuss opportunities for mutual enrichment. In §4 we share experiences from our project with our partner Wixárika communities in West-Central Mexico. In §5 we provide conclusions and ideas for how to proceed in these realms.

2 Indigenous data sovereignty

Indigenous Data Sovereignty is the right of Indigenous communities and individuals to determine how data related to their communities are collected, owned, and used (Diviacchi, 2023). This applies to any format or content of information, ranging from cultural knowledge and practices to census data (Kukutai and Taylor, 2016; Snipp, 2016). Although it is not a new concept, interest in Indigenous Data Sovereignty has gained new momentum with the advent of open data initiatives and the increasingly rapid spread of digital information. Dissemination of information about Indigenous peoples and their knowledge without permission continues to be common (De Beer, 2016) and in the fields of linguistics and ethnobiology, efforts to ensure that communities control their data have been heterogeneous. Below, we briefly summarize and contrast the evolution of thought regarding this important issue in the respective fields and describe opportunities for moving forward.

2.1 Language documentation and archiving

The development of language documentation as a field has coincided with a series of discussions related to ethics and data accessibility. Himmelmann (1998) was the first to put forward language documentation as a separate field from descriptive linguistics, focusing on ethical considerations around the rights of communities to the data collected, its privacy, control, copyright, ‘secrecy’, and culturally sensitive information. Similar ethical concerns were raised by Michael Krauss, Ken Hale, Colette Grinevard, and many others studying endangered languages in the 1990s (Hale, Craig, England, Jeanne, Krauss, Watahomigie and Yamamoto, 1992; Rice, 2011). These discussions opened the path for methodological questions about the process of editing, curating, and archiving documentary materials (Czaykowska-Higgins, 2018). Thieberger and Musgrave (2007: 26–33) restarted the discussion, asking: ‘How can ownership and access rights be negotiated so that they hold over the time frames which archiving assumes?’ This question was further complicated by the wide range of materials generated by language documentation projects (e.g., recordings, annotations, photos, pedagogical books, grammars, etc.), each with different types of intellectual property.

The discussion has continued and expanded to include community protocols for access and use (Penfield, Serratos, Tucker, Flores, Harper, Hill, and Vasquez, 2008), copyrights and intellectual property (Newman, 2011; Woods, 2023), control of knowledge and heritage (Battiste and Henderson, 2000; Czaykowska-Higgins, 2009, 2018; Leonard and Haynes, 2010; Rice, 2011; Woods, 2023), and the responsibility that comes from knowledge dissemination (Battiste and Henderson, 2000; Leonard, 2018). From this work, a set of 'best practices' has developed around the ethical issues that arise from language documentation projects (Fesl, 1993; Bell, 2007, 2010; Janke, 2009, 2021; Couzens, Gaby and Stebbins, 2020; Gaby and Woods, 2020; Riley, 2021). However, they all highlight the highly context-dependent complexity of working with diverse communities where notions of authorship and intellectual property rights and who has the right to determine whom materials can be made available to, may vary in every situation (Thieberger and Musgrave, 2007; Seyfeddinipur et al., 2019). Seyfeddinipur et al. (2019: 546–548) discuss the challenge of finding a balance between public access and confidentiality of data. Although they state that accessibility is fundamental to the field, open access presents different challenges.¹¹ As they affirm, 'fully open data are not always possible or desirable from a cultural, ethical, and privacy perspective' (cf. Dwyer, 2006; Rice, 2006, 2011; Austin, 2010; Van Driem, 2016). Recordings may contain sensitive information (such as personal, political, and social details) or information for which it would be culturally inappropriate to share them (cf. Brown, 2003:229; Christen, 2012: 2875). Rice (2011) and Seyfeddinipur et al. (2019:547) suggest that it is essential to have continuous discussions within the language community, to implement an ethical framework for intellectual property and access, and to use informed consent to explain the potential benefits and harm that could be caused by their participation in the project. Seyfeddinipur et al. (2019:550) add that some materials may not be sensitive at one point but may be viewed as such at a later point, which means that these issues need to be revisited regularly.

The discussions on ethics and data accessibility in the field have given rise to new practices over language and traditional knowledge. *Graded access restrictions* in archiving have been the most recent approach to safeguard traditional knowledge while enabling the communities to make decisions on what to share. Well-known digital archives belong to the Digital Endangered Languages and Music Network (DELAMAN),¹² which includes the Endangered Language Archive (ELAR) and the Archive of Indigenous Languages of Latin America (AILLA).¹³ Other types of archives outside of the DELAMAN network are housed in local communities, home institutions, or large data repositories such as The Tromsø Repository of Language and Linguistics.¹⁴ Despite the fact that

the archives restrict their use of the materials to educational or academic non-commercial purposes, they tend to have full open access, which jeopardizes sensitive materials without access restrictions.

Each DELAMAN archive has implemented its own access restriction system, but good examples of specific guidelines include the ELAR and AILLA digital archives. For instance, ELAR uses three access restriction levels implemented for each material: O, ‘open to be accessed by anyone browsing the archive’; U, ‘accessible by registered users’; and S, ‘restricted to subscribers who have requested and been granted access’, as shown in Figure 4.

LEVELS OF ACCESS

ELAR has three graded levels of access for every file, bundle, and collection that specifies who can access any given materials:

- O – Open to be accessed by anyone browsing the archive
- U – Accessible by registered Users
- S – Restricted to Subscribers who have requested and been granted access

Figure 4. Levels of access in ELAR (<https://www.elararchive.org/how-to-use/>).



The Archive of the Indigenous Languages of Latin America

Level 1: Public Access. AILLA Users have full access to these materials after creating an account and agreeing to AILLA's Conditions for Use of Archive Resources. For this level, we assume that depositors have already gained permission for public access from the speakers or authors of the resource.

Restricted Access. AILLA has 3 types of restricted access, Levels 2, 3, and 4, described below. All restrictions must be justified. AILLA has the following preprogrammed justifications for restricting access to materials:

- Protected population (e.g., children)
- Required by IRB or other authority
- Access restricted by speech community
- Wish of speaker or speaker's family
- Ceremony, ritual or esoteric language
- Thesis in progress
- Material under copyright
- Could not obtain informed consent
- Administrative curation in progress
- Other reason: please explain (if this option is selected, a text box will appear for the explanation)

All materials with restricted access (levels 2, 3, and 4) are password protected. Users may access recordings only if they know the password that the depositor created and shared with them. Depositors have the option of assigning a visible hint to accompany the password.

Level 2: Curation in progress. This type of restriction is reserved for (1) materials that are under curation (by AILLA, by the depositor, or by the depositor's delegate) and (2) materials that must remain restricted for various reasons that must be justified. Level 2 restricted access must be renegotiated with AILLA every five years. (AILLA will contact the depositor at the appropriate time.) If not renegotiated, access levels will be determined by the archive. For extremely sensitive information that must be guarded indefinitely, the depositor must either (1) establish a succession plan for who will make decisions about the materials after his/her death or (2) reconsider if those materials should even be added to the archive.

Level 3: Temporary embargo. Users may not access the resources until after a specified date. This level allows the depositor to restrict access to resources for a few years, for example while preparing a publication, such as a dissertation, or for the lifetime of a speaker. After the time limit, access changes to public access (Level 1).

Level 4: Controlled access. AILLA will provide contact information and the user must contact the depositor (or some other access "controller") directly for permission to access the resource or file. The controller must ensure that their appropriate contact information is up to date in the AILLA record. If contact information is not up to date and/or the controller does not respond to email from requesters/AILLA users, then determination of permission to access and use the resource/file reverts to the manager of the archive. A depositor must establish a succession plan for who will control the materials after their or the controller's death.

Figure 5. Levels of access in AILLA (<https://ailla.utexas.org/node/117>).

AILLA, on the other hand, has two types of access, 'Public' and 'Restricted' Access, but adds degrees of specificity in cases of 'curation in progress', 'temporary embargo', and 'controlled access', as well as a set of justifications to choose from such as protected population, wish of speaker or speaker's family, or could not obtain informed consent, as illustrated in Figure 5.

ELAR and AILLA have given special attention to ethnobotanical knowledge given concerns over non-consensual use or commercialization of community intellectual property (Seyfeddinipur et al., 2019:550). These risks can be at least partially mitigated by archive-based requirements for registering users, tracking downloads to allow better oversight of the use of the content, and providing clear ethical guidelines on uses of the material (Seyfeddinipur et al., 2019:550).

Despite the fact that the field has developed an approach to help safeguard traditional knowledge from Indigenous Peoples and local communities, it is still far from being a homogeneous practice, and it is not clear how communities use the data collected during the lifespan of a project.

2.2 Ethnobiology and data sovereignty

Ethnobiology has often been conceptualized in the multiple overlapping 'phases' of I. Utilitarianism, II. Cognitive and linguistic ethnobiology, III. Ethnoecology, IV. Indigenous ethnobiology, V. Interdisciplinarity in an era of rapid environmental change, and VI. Decolonizing ethnobiology (Hunn, 2007; Wolverton, 2013; McAlvay et al., 2021). Ethnobiology IV is closely aligned with the goal of data sovereignty as it 'emphasizes the rights of indigenous peoples to control their traditional knowledge' (Hunn, 2007). Hunn (2007: 7) describes the turn in phase IV being partially driven by the fact that 'Indigenous activists became increasingly wary of the consequences of freely sharing their understanding of the world with outsiders'. Additional motivation came from the ongoing discussion from international ethical standards, such as the Belmont Report (1979)¹⁵ and The Declaration of Helsinki (2013)¹⁶ that were developed around medical, biomedical, and behavioral research involving human subjects.

The First International Congress of Ethnobiology in 1988 and Daryl Posey's 1990 article 'Intellectual Property Rights: What is the Position of Ethnobiology?' are widely credited for catalyzing contemporary discussions of 'intellectual property' and Indigenous knowledge protection issues in the field. Since these calls, major international treaties and organizational bodies, such as the Convention on Biological Diversity (1992)¹⁷ and especially the Nagoya Protocol (2010),¹⁸ have emerged to protect the intellectual property of Indigenous Peoples and local communities, especially in relation to ecological knowledge (Golan, Athayde, Olson, and McAlvay, 2019) as well as extralegal strategies to protect intangible

cultural heritage (Bannister, 2009). Many ethnobiologists continue to adhere to the Code of Ethics of the International Society of Ethnobiology (2006),¹⁹ which supports the need for researchers to respect community sovereignty over their knowledge and ensure involvement in projects at every stage.

These measures have been due, in large part, to concerns about the external exploitation of traditional knowledge without tangible benefits to local communities (Mgbeoji, 2014). The call for a sixth phase, ‘decolonizing ethnobiology’, adds an explicit emphasis on data sovereignty through the lifespan of a project and beyond, questioning who should have access to community knowledge in general (McAlvay et al., 2021). Data sovereignty is also aligned with an additional growing focus of the field: ‘action ethnobiology’, which seeks to integrate aspects of social justice and anti-oppressive movements in scientific research (Armstrong and McAlvay, 2019). However, despite the development of norms in the field such as soliciting prior informed consent from community participants – also applied in linguistics – and creating explicit benefit sharing agreements, it is often still not clear in studies whether communities have continued with determining how data is used during and beyond the lifespan of the project. New mechanisms for ensuring that community wishes for how information is used are also gaining interest among ethnobiologists. One example is Traditional Knowledge and Biocultural Labels developed by ENRICH (Anderson and Hudson, 2020), as shown in Figure 6.

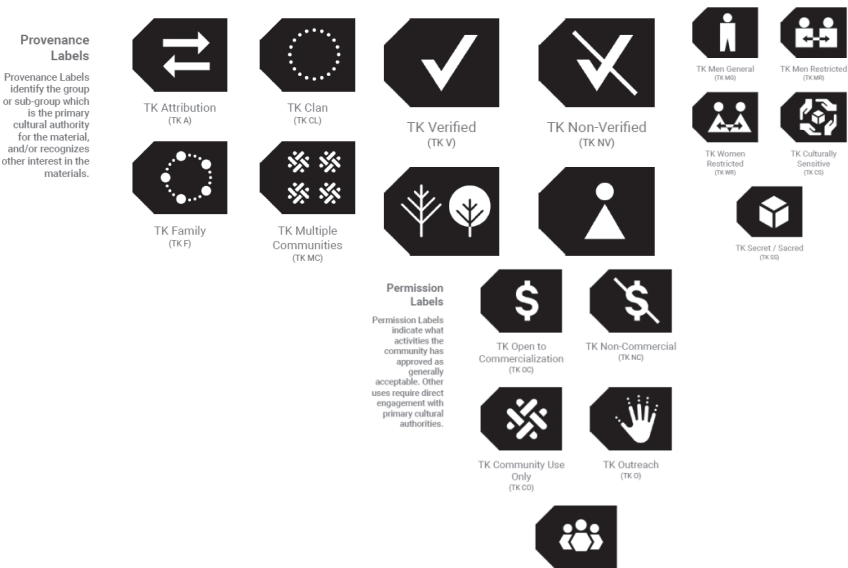


Figure 6. Sample of some of the Traditional Knowledge Labels (<https://localcontexts.org/labels/traditional-knowledge-labels/>).

The labels are selected, customized, or created by communities, with existing labels that include provenance labels such as ‘TK Attribution’ to make it clear that the provenance of the data should accompany it, protocol labels such as ‘TK Secret/Sacred’, which indicates that the data has secret/sacred information with specific conditions of access, and permission labels such as ‘TK Non-Commercial’, which indicates that the data should not be used for commercial purposes (Local Contexts, 2023). These labels could potentially be applied to ethnobiological databases, publications, physical biocultural collections, data on herbarium specimens, and other targets to ensure that there is transparency in research engagements with communities, and community expectations for future use of data collected are clearly defined (Liggins, Hudson, and Anderson, 2021).

While graded access has been widely employed in linguistics (§2.1), the use of these strategies to reconcile open access and community data sovereignty are still in their early stages in ethnobiology. While a number of project-specific (e.g., *The Flora of Vanuatu*, 2023) and data aggregating sites (e.g., *Native American Ethnobotany Database*, 2023) exist online, centralized archives with data uploaded from many projects have not been widely adopted despite having long been called for (Skoczen and Bussman, 2006). Promising new initiatives have emerged, however, including the *Ethno-ornithological World Atlas* (2013), the *Cultural and Historic Guide to Northwest Native Plants* (Carney et al., 2022), and a Chiapas, Mexico recipe database (Amanda Thiel, personal communication). Several of these projects employ the Mukurtu content management system,²⁰ a tool which has fine scale graded access options which provide options for ethical dissemination of research, shown in Figure 7. Mukurtu was designed specifically to navigate the challenge of simultaneously making Indigenous and local knowledge accessible and protected. As Carney et al. (2022) propose, this resource could be a key tool moving forward in paleoethnobotany and other fields interfacing with biocultural heritage.

As fields, linguistics and ethnobiology have worked to advance ethical approaches as summarized in Table 1. However, they approach the topic of data sovereignty from slightly different angles.

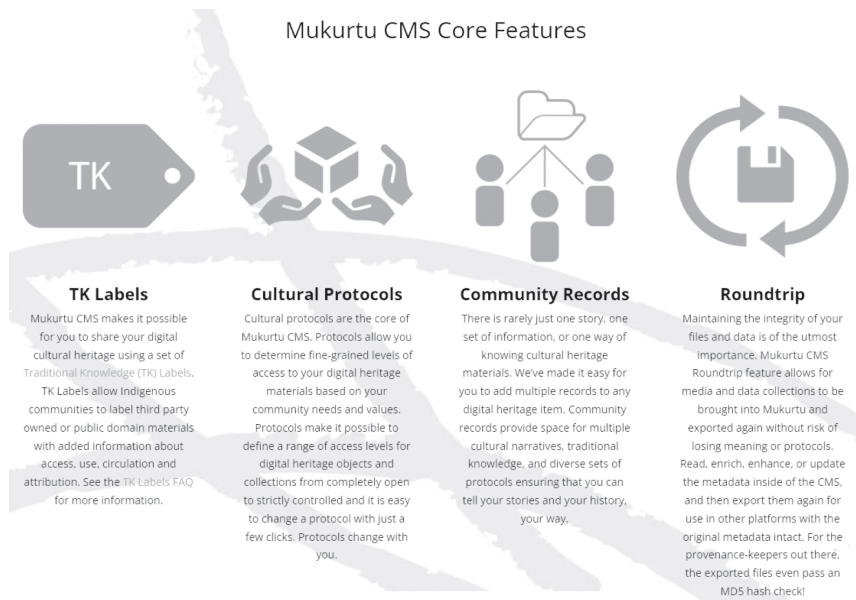


Figure 7. Mukurtu CMS Platform Core Features (<https://mukurtu.org/>).

Table 1. Linguistic and ethnobiology approaches to data sovereignty over time.

Aspect	Language Documentation	Ethnobiology
<i>Ethical Concerns and Intellectual Property</i>	Community rights to data, privacy, control, copyright, and knowledge protection	
<i>Practices and Norms</i>	Development of ‘best practices’ around ethical issues and archiving	Implementation of prior informed consent and benefit-sharing agreements; development of the Code of Ethics of the International Society of Ethnobiology (2006)
<i>Data Sensitivity and Transparency</i>	Challenges in balancing public access with confidentiality	Ensure transparency and define community expectations for data use.
<i>Archiving and Access Restrictions</i>	Graded access restrictions in archiving (e.g., DELAMAN, ELAR, and AILLA)	Traditional Knowledge Labels and Biocultural Labels through ENRICH and Mukurtu platform

Recent developments in linguistics emphasize the importance of ethical considerations around community rights to data, privacy, control, copyright, and culturally sensitive information, as highlighted by pioneers like Himmelman and supported by discussions from Krauss, Hale, and others. This field has evolved

to include discussions on ownership, access rights, and the complexities of intellectual property across various materials generated by language documentation projects. The establishment of digital archives with graded access restrictions, such as those by DELAMAN, reflects a nuanced approach to balancing open access with the need to protect sensitive information. Conversely, Ethnobiology, particularly in its fourth phase aligned with data sovereignty, focuses on the rights of Indigenous Peoples to control their traditional knowledge, a sentiment echoed since the First International Congress of Ethnobiology. The field has witnessed the emergence of international treaties and organizational bodies and extralegal strategies aimed at protecting Indigenous intellectual property, especially regarding ecological knowledge. Recent developments, like the introduction of Traditional Knowledge and Biocultural Labels, and the Mukurtu platform, aim to ensure that community expectations for data use are met, offering a more customized approach to managing data sovereignty.

Both fields underscore the importance of respecting community rights and the complexities of managing sensitive data. However, linguistics has leaned more towards establishing broad ethical practices and access restrictions within digital archives, while ethnobiology emphasizes the rights of Indigenous Peoples and the development of tools like labels to manage data sovereignty. Each field brings valuable perspectives and methodologies to the table, highlighting the importance of interdisciplinary dialogue in addressing ethical considerations in research involving Indigenous and local communities. Despite progress, practices are not homogeneous and the usage of collected data by communities during the lifespan of a project is unclear in both fields.

3 Community engagement

Community engagement in research is broadly defined as involving mutually beneficial partnerships among academics and community partners (Cowan and Leung, 2021; McAlvay et al., 2021). This approach positions projects along a continuum, ranging from researcher-centered at one end to community-based research at the other (Cameron, Frazer, Harvey, Rampton and Richardson, 1992; Lenkersdorf, 2008; Czykowska-Higgins, 2009; Rice, 2011; Leonard, 2018).²¹ Although community engagement has become essential or expected across the social sciences (Czykowska-Higgins, 2009; Rice, 2011), particularly when working with people who face structural disadvantages as a result of historical and present-day colonialism (McAlvay et al., 2021: 173), it is still not clear what this concept means in different contexts and what the ‘best practices’ are given

that each community has different expectations. Below, we briefly summarize the history of thought about community engagement and the solutions proposed in ethnobotany and linguistics.²²

3.1 Language documentation and community participation

Linguists have the responsibility to engage with the community in addition to the typical research outputs that focus on creating corpora and managing data analysis (Himmelmann, 1998, 2006; Woodbury, 2003, 2011; Austin and Grenoble, 2007; Yamada, 2007; Austin, 2010; Dwyer, 2010; Grenoble, 2010; Rice, 2011; Bown and Warner, 2015; Dwyer, 2016; Cruz Cruz, 2020; Harrison, 2022; Woods, 2023).²³ This concept has been promoted in response to a long tradition of ‘lone wolf’ linguists who collected data without leaving any primary data or research products to the community or consulting community members to understand their interests, a practice largely developed within the auspices of colonial/or missionary goals (Errington, 2008).

Community engagement in the field is closely tied to approaches such as Participatory Action Research, Community-Based research, and similar terms (Wilkins, 1992; Furbee and Stanley, 2002; Shaw, 2004; Mosel, 2006; Yamada, 2007, 2011; Dobrin, 2008; Penfield, Serratos, Tucker, Flores, Harper, Hill and Vasquez, 2008; Czaykowska-Higgins, 2009; Holton, 2009, 2017; Rice, 2011; Truong and Garces, 2012). Research objectives and academic requirements that are incompatible with community engagement have hampered community-engaged work to some degree (Leonard, 2018; Woods, 2023), but researchers are increasingly turning their attention to community relationships and community needs (Woodbury and England, 2004; Czaykowska-Higgins, 2009, 2018; Thieberger, 2016; Hernández Castillo, Hutchings and Noble, 2019; Woods, 2023). More active participation of the community members in research is considered an essential ethical practice (Woodbury and England, 2004; Czaykowska-Higgins, 2009, 2018; Thieberger, 2016; Hernández Castillo, Hutchings, and Noble, 2019; Leonard, 2018; Woods, 2023). Collaborations of this type entail working with local authorities or political figures particularly if the language is highly endangered (Crippen and Robinson, 2013). It has also become common to invite native speakers as principal investigators or work with local authorities to build capacity (Hill and McConvell, 2010; Leonard, 2018).

Engaging in language revitalization and maintenance is increasingly becoming a focus of language documentation projects (Crippen and Robinson, 2013). However, it is common to collect different kinds of materials that are not accessible or useful for the communities (Eira, 2007; Berez, Finessand, and Linell, 2012; Woods, 2023). As Holton (2017: 22) highlights:

It's not enough to simply provide a download link or send a bunch of files on a flash drive. Meaningful digital return must put communities in control of their digital heritage. Language resources begin with the communities. Speakers share these resources with every expectation that they will be returned in a form that will be useful to the community.

Grants that fund language documentation projects have required objectives toward community engagement to address these issues, but they do not generally consider language revitalization and maintenance as part of them.²⁴ One approach linguists have taken is expanding the outputs of documentation projects beyond grammars, dictionaries, and text corpora to be deposited in specialized archives. These outputs include websites, apps, videos, and pedagogical materials (Czaykowska-Higgins, 2009; Rice, 2011).

O'Meara and Guadarrama González (2016) discuss different case studies worldwide where primary data collected were distributed in their respective communities in three different ways: (i) 'Information communication technology (ICT)' making materials available through multimedia formats that are pedagogically relevant to the speaker community (Nathan and Csátó, 2006); (ii) 'local archives' in communities or universities with reliable internet connection; and (iii) a 'jukebox or community portal', a computer that contains easily movable files (mp3 format) and where community members can add more material without needing the internet. Although these products have the potential to meet the purpose of community engagement and accessibility, O'Meara and Guadarrama González (2016: 77) state that we need to continue this discussion to arrive at plans that take into consideration the local needs and resources available in each speech community. In particular, they discuss the complication in different communities in the Mexican context as the conditions are not suitable for installing a local archive or a jukebox. They suggest that it is better to seek a more low-tech approach to making primary data available, and possibly changing the format of the primary data in ways that respond to the needs of the community.

3.2 Ethnobiology and community collaboration

An emphasis on community engagement in ethnobiology has developed in parallel with its development in linguistics. The roots of contemporary academic ethnobiology can be traced to European and Euro-descendent researchers' efforts to 'discover' uses for plants that could be of benefit to settler and/or colonial powers (Clément, 1998; Voeks, 2018). Similar dynamics persist in the form of 'parachute science', in which researchers collect data from communities and benefit from those data without developing meaningful relationships or

contributing to community interests (Barber et al., 2014; Chapman et al., 2015). However, in the ‘Indigenous ethnobiology’ phase of the field outlined by Hunn (2007: 7), a growing awareness arose that ‘[w]e have no right to demand that others share their knowledge with us, not even in the interest of human enlightenment. Rather our science and our scholarship – involving as it does human subjects – must be truly collaborative’ and that these collaborations should be of ‘substantial mutual benefit’ (Hunn, 2002). This is not to say that projects that involved close collaboration and mutual benefit with communities did not exist before more public discourse on community engagement in the 1990s. Indeed, ethnobiology was a leader in some regards, such as the involvement of local and Indigenous community members as coauthors on research publications, with early examples (Majnep and Bulmer, 1977) predating similar practices by anthropologists (Hunn, 2007). As in linguistics, participatory action research has also been increasingly employed in ethnobiology (Cunningham, 2014; Sauini et al., 2020). Efforts to avoid parachute science have included commitments to reciprocity (Baker, 2016) and the development of meaningful relationships (Reo, 2019) with communities. Reo (2019) proposes the term ‘relational accountability’, based on the Anishinaabeg (Algonquian)²⁵ concept of *Inawendiwin*, which entails a commitment to community members regardless of issues of budget and time. Among the ways ethnobiologists have worked to foster reciprocity are codevelopment of community handbooks and websites, establishment of community-run natural history collections like herbaria, and support of communities’ territorial sovereignty (McAlvay et al., 2021).

Linguistics and ethnobiology emphasize the critical importance of community engagement in their respective fields, yet they show different historical backgrounds and approaches to collaboration, as summarized in Table 2.

Table 2. Generalized linguistic and ethnobiological approaches to community engagement.

Aspect	Language Documentation	Ethnobiology
<i>Historical Background</i>	Evolved from ‘lone wolf’ to participatory and community-based research	Transitioning from focus on benefits to researcher’s society to collaborative approaches and benefits to communities
<i>Approach to Collaboration</i>	Community-based research and active community participation	Developing meaningful relationships and ensuring mutual benefits, avoiding ‘parachute science’
<i>Key Practices</i>	Creating outputs like websites, apps, pedagogical materials that serve community needs	Co-development of community resources, support for territorial sovereignty, establishment of community-run collection

Language documentation has evolved from a practice often criticized for the ‘lone wolf’ approach to one that prioritizes community-based research. This shift is a response to the ethical imperative of engaging communities not just as subjects but as partners in research. Linguists are increasingly focused on creating outputs like websites, apps, and pedagogical materials that directly serve community needs. On the other hand, ethnobiology’s engagement with communities similarly reflects a transition from a more colonial dynamic, where research is conducted for the benefit of the researcher and their society without genuine community involvement, to a more collaborative and reciprocal approach. The field acknowledges the importance of avoiding ‘parachute science’ by developing meaningful relationships and ensuring mutual benefits. Efforts to foster reciprocity have led to the codevelopment of community resources, support for territorial sovereignty, and the establishment of community-run natural history collections.

While both fields share a commitment to transforming their approaches to be more community-centric, linguistics has focused on overcoming a legacy of extractive research by enhancing community access to linguistic resources. This includes providing outputs, such as websites, apps, videos, and pedagogical materials, that go beyond traditional forms (e.g., grammars or dictionaries). Ethnobiology, on the other hand, has been also proactive in ensuring that research collaborations are grounded in mutual benefit, reciprocity, and the co-creation of knowledge. Both disciplines highlight the evolving understanding of ethical research practices that prioritize community interests, involvement, and benefits. However, the practices continue to be heterogeneous as each community has different expectations and needs.

4 Insights from the Language of Land and Life project

The creation of an interdisciplinary project often faces challenges, as the expectations, methods, outputs, and conventions of the fields are not always easily reconciled or understood by all parties. Such projects demand the integration of distinct disciplinary perspectives to achieve a cohesive research endeavor. Our project, which will span 36 months and has already progressed 20 months, is an example of this effort. The initial stages have included workshops on Ethnobotany and Language documentation for the team in Nayarit (Mexico), project progress presentation to two Wixárika communities, and data collection. We have also focused on bridging the methodologies in both fields targeting three main aspects: (i) data collection, (ii) data sovereignty, and (iii) community engagement; the latter two are the main focus on this paper. Regarding data

collection, our efforts have included recordings of interviews in both Spanish and Wixárika, trying to balance language documentation goals and ethnobiological data collection techniques. Additionally, we have implemented elicitation mechanisms from linguistics (Bohnemeyer, 2015: 15; 42–43) in order to capture ethnobiological concepts (e.g., ecotopes ‘types of ecosystems’) that reflect the speaker’s language use and morphological complexity without Spanish interference. Through these strategies, we aim to ensure that our data collection processes are both effective and respectful of the diverse dynamics at play in our fields of study. This process has been enriched by insights from the literature of both disciplines, striving towards shared academic goals.

A significant aspect in the discussion of interdisciplinary projects is reconciling understandings and definitions around what constitutes a ‘Community-Based’ focus (Czaykowska-Higgins, 2009; Bradley, Moore, Simpson and Atkinson, 2018; Leonard, 2018), which includes considerations such as data sovereignty. We argue that this aspect, despite its complexities, is perhaps the most critical consideration of a project. Our Language of Land and Life project presents an example of attempting to merge methodologies regarding community engagement and data sovereignty while illustrating how the research outputs required by academic institutions do not always meet the needs and expectations of the communities involved (Czaykowska-Higgins, 2009; Rice, 2011; Leonard, 2018; Cruz Cruz, 2020). The needs of each speech community must be considered individually by ongoing consultation and agreements when designing the project (Nevins, 2004; Dobrin, 2008; Czaykowska-Higgins, 2009; Rice, 2011; Leonard, 2018; Cruz Cruz, 2020), but also throughout its lifespan as we have observed in our project. Although funding institutions require a fixed set of goals, we should consider having flexibility to accommodate needs and expectations that may change throughout the course of the project.

In the following sections, we share our experience with two Wixárika communities focusing on data sovereignty and expectations for community engagement that shed light on how to find a balance to navigate interdisciplinary research and community needs and expectations.

4.1 Data sovereignty

Our project requires collecting Traditional Ecological Knowledge (TEK) – defined as a body of knowledge built up by a group of people through generations of living in close contact with nature (Brockman, Masuzumi, and Augustine, 1997) – which can include culturally sensitive information. To ensure continued community curation of ethnobiological data that is collected and compiled into the research outputs, we will use the different tools proposed

in ethnobotany and linguistics (§2.1 and §2.2). However, we will adapt them based on the specific case of the Wixárika community. The Wixárika cultural context presents several considerations to be taken into account. Unlike many Indigenous groups in Canada and the United States which have centralized First Nations or Tribal governments, there is no parallel Wixárika body. We plan to work on the community scale by consulting with participants and community leaders to ensure that the CARE principles, i.e., collective benefit, authority to control, responsibility to community, and ethics, are taken into account (Carroll, Herczog, Hudson, Russell, and Stall, 2021). Although the Wixárika people and their communities span four Mexican states, the constant consultation with our partners and community leaders will help ensure that the data sovereignty principles have applicability across communities.

We plan to use the Mukurtu platform for the Ethnoecological and Ethnobotanical database and the ELAR archive to store the data generated by this project as both follow similar graded access principles in the fields. These platforms were presented at the *asamblea*²⁶ for the two communities involved, since one of the main concerns raised by the Wixárika people was the potential for misuse of the information without giving credit and respect to the traditional knowledge of the community. To ensure that communities' wishes over how data is used accompanies the relevant data, we will also employ tools developed by Equity for Indigenous Research and Innovation (ENRICH), such as Traditional Knowledge labels. These labels will be applied to entries in the Mukurtu and ELAR archives, the physical handbook, videos shared on the 'Voces del Gran Nayar' YouTube page, cultural information on herbarium labels, and other outputs, as illustrated in Figure 8. We will also append Biocultural Labels to herbarium specimens collected in Wixárika traditional territories. Although applying these labels is not common in ELAR due to the graded access permissions, we plan to be consistent, and hopefully, to spread the use of the labels in different cultural materials not only related to TEK, as some of the Wixárika community members suggested.

Not shown in Figure 8 are additional categories such as annotated songs and stories with audio, narrated and transcribed videos with native speakers demonstrating activities related to the plant. Traditional Knowledge labels (at bottom right) developed by ENRICH will be applied to indicate community wishes surrounding traditional knowledge. Information in the example is drawn from a publicly available dissertation (Bauml, 1995).

EnglishEspañolWixárika

Wixárika name (Nueva Colonia, Jalisco):
Maxa naka 'ukari 

[Gloss]
Deer ear female
Deer's ear (female)

Spanish name: Algodoncillo de Jalisco

Latin name: *Asclepias jaliscana* (Apocynaceae)

Identification: [Identifying characteristics]

Habitat description: 
[Habitat description and gloss]

Uses:
Edible: Leaves, flowers and immature fruits eaten boiled or sauteed with onions and tomatoes.
Medicinal: Fruits eaten by women three times during their pregnancy to help their babies grow.
Notes: A hairy-leaved variety of *Asclepias jaliscana* called maxa naka 'ukitsi (Deer's ear [male]) is not eaten.
Management:
Protected from weeding when occurring spontaneously in maize fields.



TK OutreachTK Non-Commercial



TK Multiple Communities



Figure 8. Sample segment of database page for *maxa naka 'ukari* (*Asclepias jaliscana*, ‘The female deer’s ear’).

During the second phase of the project, which involves the creation of output materials, our plan is to maintain continuous consultation with the two communities to ensure that their wishes regarding the use of the data are respected. Furthermore, we intend to extend this consultative process beyond the project’s completion in May 2025, recognizing that certain information, while not culturally sensitive at one point, may become so in the future. The outputs are being designed to allow for the inclusion of information gathered by the community and other Wixárika communities not involved in this project at this time. This approach aims to facilitate the communities’ control over their knowledge, ensuring they can incorporate new data beyond the lifespan of the project.

4.2 Community engagement

Our project provides an example of the need for flexibility in project deliverables and to move away from ‘one size fits all’ approaches to community engagement. Four considerations became apparent when working to ensure community engagement. While enthusiastic and supportive of the goals of the project, these communities raised several questions related to the products and community engagement, which made us revisit the outputs of the project. Researchers commonly have to follow requirements for funding, usually meaning digital technology-based products which may not be accessible for people in the community (Czaykowska-Higgins, 2009; Rice, 2011; O’Meara and Guadarrama

González 2016). Representatives particularly from Tiwetia expressed concern that community accessibility to these outputs may be limited. O'Meara and Guadarrama González (2016) highlight these concerns in Mexican documentation projects as many communities do not have the internet infrastructure to allow reliable access to online research products or to be able to contribute to them throughout time.

We mentioned to the local authorities that our project also aims to print a handbook and design pedagogical materials, which are common in language documentation projects (Czaykowska-Higgins, 2009; Rice, 2011: 200). Although the traditional authorities considered these preferable to online resources (Cruz Cruz, 2020), the community expressed concern that physical written resources may also have limited accessibility due to the range of reading abilities in the community. Thus, our Wixárika team members proposed that we could share four types of tangible results that are outside of the original research objectives, so that we could engage the community in different ways:

(a) *Community herbarium*. Creating a community herbarium will allow community members to see the dried plant specimens and information in a space located inside the community. In this way, not only the information collected will be kept in an accessible location, but the community members will also be involved in building the herbarium and will learn how to carry out ecological and linguistic data collection for posterity. This idea aligns with other outputs of biocultural projects, such as seed banks, herbaria, medicinal plant gardens managed by Indigenous communities (Martin, 2010; Dierig, Blackburn, Ellis, and Nesbitt, 2014; Balick and Hillman-Kitalong, 2020) but are not common in language documentation projects. To integrate the linguistic element into this community herbarium, we plan to look for ways of leaving spoken records with the information of each plant. This approach aims to give access to different literacy levels and to capture the actual linguistic practice, particularly in communities where language transmission is predominantly oral. In the case of the two Wixárika communities, we concluded that a community herbarium with primary data in different multimedia formats and the handbook would be a good fit. This herbarium will also, according to the plan, be connected to the Ethnoecological and Ethnobotanical website through a QR code so that members of the community can have direct access. Although a community herbarium was not originally envisioned as one of the project's outputs, we determined that it would be beneficial not only for directly engaging the community but also for integrating ethnobotanical and language documentation products in a way that are not necessarily exclusive. Therefore, additional plant specimens are being collected to ensure that one

sample is left with each community. The emergent challenge would be to find an appropriate place in both communities for the herbarium, which will be decided towards the end of the project.

(b) *Linguistic and ethnobiological landscapes.* Despite being transmitted to children to varying degrees (between 39.5% and 49.4% depending on the dialect, Instituto Nacional de Lenguas Indígenas, INALI, 2012), Wixárika is considered endangered due to the cumulative social pressures from the Spanish-speaking majority. Its use is confined mainly to the nuclear family, traditional rituals, local administration, and primarily adults (Carrillo de la Cruz, 2016). A significant challenge is the scarcity of medical, legal, and educational resources in Wixárika, with most Indigenous community teachers speaking only Spanish (Carrillo de la Cruz, 2016). This situation, along with stigmatization and social exclusion, pressures young speakers to abandon their language and discourages families from teaching it to their children. Elders and adults are notably concerned about the diminishing proficiency in Wixárika among younger generations (Carrillo de la Cruz, 2016). For this reason, our Wixárika team members expressed their interest in using the project as a means to revitalize not only traditional botanical knowledge but also the language. One coauthor of this article, Tutupika Carrillo de la Cruz, along with his team from CELINAY²⁷ and the Applied Linguistics program at University Autonomous of Nayarit, proposed engaging the communities in ‘linguistic landscapes’ with the botanical knowledge, a common practice for revitalization efforts. This initiative was also conceived because parts of the lexicon and knowledge concerning TEK are among the most threatened worldwide (Si, 2011), as the loss of language often coincides with the loss of global biodiversity. Linguistic landscapes, as a sociolinguistic phenomenon, are broadly defined as the visual representations of language in public spaces and people’s interaction with them, serving social, cultural, and political roles, since language is also part of the physical environment (Shohamy and Gorter, 2009; Blommaert, 2013; Van Mensel, Vandenbrouke, and Blackwood, 2016). Both communities agreed on executing this practice because it is a way to start revitalizing the language and to promote language awareness more actively. This activity involves making the time, finding the space, and getting the materials to build the signs with the community to truly engage their participation. To fulfill this goal, our team will incorporate these objectives in Carrillo de la Cruz’s language revitalization projects in his home institution in addition to finding additional resources. It is important to note that linguistic landscapes featuring some semantic domains (e.g., places like store, house, school, etc.) have been utilized in both communities before but not consistently or extensively, thereby presenting an opportunity to revisit and enhance this effort.

(c) *Involving Wixárika students.* Our Wixárika collaborators expressed their interest in inviting college Wixárika students to participate in the research activities. Inviting Wixárika students helps build a capacity for preserving language and culture and motivates other community members to engage in similar activities. The addition of Wixárika students in the project was welcomed in both communities since elders have expressed their concerns about younger generations not learning the language and not getting involved in cultural practices in their communities. In our team, we have five Wixárika students²⁸ who have joined different activities based on their interests: (i) transcription/translation of interviews, (ii) data collection by carrying out interviews in Wixárika or collecting plant/soil samples, and (iii) creating the material outputs of this project (website, handbook, or pedagogical materials). This practice also helps support ‘Indigenous leaders’ (Alonso Ortiz, 2020: 96; Cruz Cruz, 2020) who are committed to the community, culture, and language. Throughout the lifespan of the project, we ensure that these students are trained with tools that will not only help them achieve the project’s goal but also enable them to carry out their own community projects independently. A positive outcome we have observed is that when the younger generation living in the community witness our fieldwork activities, such as the revitalization of the ceremonial drink *tuchi* in Xatsitsarie or the plant photography workshop in Tiwetia, they join in out of curiosity, thus fulfilling the communities’ wishes of active participation and involvement of community members.

(d) *The engagement of the researcher with cultural practices.* Funded projects require a timeline to accomplish a number of academic objectives. However, this can be difficult to reconcile with the time needed to build a relationship with community members (Czaykowska-Higgins, 2009; Leyva Solano, 2019; Martínez Pérez, 2020). Building a relationship with the community is essential as Harrison (2001: 54) notes: [I]t is nearly impossible to design and establish collaborative programs without knowing the community well’. One aspect of relationship building that has emerged in our project involves engaging with the communities’ cultural/spiritual practices. Each community requested the research team’s involvement in their rituals in various ways. For instance, in Xatsitsarie, we are always welcome to participate in the rituals while conducting interviews (Figure 9) or help collect the materials needed for rituals (e.g., collecting wood, fishing, making the ritual objects, etc.); whereas in Tiwetia the local authorities have requested our participation in ceremonies throughout the year, and if we are unable to be present, they ask that we send offerings.



Figure 9. A local *mara'akame* (shaman) in Xatsitsarie lit candles for each team member after interviews and involvement in the corn ritual.

The nature of our project requires collecting plants and understanding their use and practices in the Wixárika culture. To maintain the respect protocols (Smith, 2016:128) particular to each culture and engage with the community fully, we need to attend to those requests. Although fieldwork periods are brief, with limited time to collect data, and involvement in the rituals can take several hours or even days, it has been important for our engagement with the community. These types of activities are not often aligned with the priorities of funders and academic institutions, which often focus on research outputs and capacity building, thus creating a potential mismatch.

Our project illustrates the need for flexibility in deliverables, highlighted through our interaction with partner communities. Despite the strong support for the project's goals in the communities, concerns were raised regarding the accessibility of the originally proposed outputs, prompting a reevaluation of our deliverables. In response, we proposed four tangible outcomes beyond our original research objectives to engage the community: (a) a community herbarium to facilitate both ecological and linguistic data preservation and access, (b) linguistic and ethnobiological landscapes to aid language revitalization and address the endangered status of Wixárika, (c) involving Wixárika students in research activities to build capacity for language and cultural preservation, and (d) more extensive researcher engagement in cultural practices, acknowledging the importance of building relationships with community members beyond

academic objectives. These strategies aim to accommodate community needs and resources, fostering a more inclusive and participatory approach to community engagement and knowledge preservation.

The second stage of the project will focus on completing data collection and the creation of the material outputs outlined in the original proposal. Additionally, we will start collaborating with the communities on the herbarium and linguistic landscapes. While these latter objectives introduce additional planning and may present emergent challenges related to infrastructure, funding, and managing various capacities, we are dedicated to achieving these goals as part of our commitment to our partner communities. This, in turn, will enhance our credibility and contribute to decolonizing research practices.

5 Conclusion

So far, the Language of Land and Life project has demonstrated to us the need for flexibility in project deliverables and a shift to community-specific engagement strategies. Echoing Pérez González (2020: 127), we have learned that effective methodological practices are often contingent upon the unique rules and interactions within each community. Interventions that seek to decolonize research must also be case-specific, as highlighted by Leonard and Haynes (2010) and Leonard (2018). Our ongoing dialogue with our Wixárika collaborators has proven crucial in understanding their perspectives on data sovereignty and community engagement.

The governance structure of Wixárika society requires a customized approach to data sovereignty, ensuring that decision making is at the level of individuals and communities rather than a centralized body. However, constant consultation with community members and leaders will ensure that data sovereignty principles are inclusive across communities. Using the tools proposed by ethnobiology and linguistics together, namely, ELAR graded access archive, the Mukurtu platform, and the TK labels in the research outputs, will support continued curation of the materials.

We have also learned that it is essential to involve the community from the earliest stage possible while recognizing that funding organizations have expectations. Instead of developing a project with strictly defined community engagement outputs, having communities suggest outputs and/or sharing a 'menu' of ideas for deliverables for communities to choose from avoids top-down dynamics. This is, in part, held back by conceptions that community-based research is not considered real or rigorous (Bown and Warner, 2015: 76), despite many findings to the contrary – that close engagement with communities is able to

enrich the scientific aspects of projects (Rice, 2011; Armstrong and Brown, 2019; Cruz Cruz, 2020; Woods, 2023). The inclusion of community-suggested outputs, such as the community herbarium and linguistic landscapes, marks a more ‘horizontal relationship’ (Martínez Pérez, 2020: 25), underlying the need to listen and respect community expectations, concerns, and requests that benefit them (Guérin and Lacrampe, 2010; Barber et al., 2014; Chapman et alii, 2015; Leonard, 2018; McAlvay et al., 2021; Woods, 2023). Despite the fact that our technology-based material outputs for the project (website and audiovisual online archive) were welcomed by the community, there were concerns about their accessibility. More recent literature on language documentation addresses the importance of provisioning tangible results to the communities (Lizama, 2006; Cruz Cruz, 2020; Martínez Pérez, 2020; Woods, 2023). Accessibility of outputs, especially the technology-based ones, have been discussed widely (Austin, 2006; Bowden and Hajek, 2006; Dwyer 2006), particularly in reference to archiving (Johnson, 2004; Holton, 2017); however, no consensus has been reached as each situation represents an individual case. McAlvay et al. (2021) raise a similar situation for ethnobotanical projects. Although there is certainly progress, with some funding agencies and other institutions requiring capacity building, or community-oriented outputs (Czaykowska-Higgins, 2009), there is still work to do to align institutional expectations with ethical research and community expectations (Cruz Cruz, 2020).

Building strong community relations is of utmost importance because it is nearly impossible to design and establish collaborative programs without knowing the community (Harrison, 2001: 54). One aspect of building relationships that has emerged in our project is engaging in the extensive participation in cultural/spiritual practices of the community. Following Martínez Pérez (2020: 30), we have learned that the community values our presence and our support in ritual or daily activities more than the just that are generated through institutional interests. Unfortunately, grant institutions and researchers often seek community engagement mostly through capacity building –which we are doing by training Wixárika students – and research outputs, but little is done about engaging in cultural and spiritual practices.

Overall, we can conclude that linguistics and ethnobiology share significant overlaps not only related to the classification and encoding of biological knowledge, but also in data sovereignty and community engagement considerations. Cross-communication between these disciplines may accelerate the growth of both fields. Changing approaches of data collection and curation in both fields and opportunities for mutual exchange of ideas and approaches can trigger better practices. As linguist Harrison (2022) states:

My shift in attention to the environment also required a shift in my methodology, from the standard data extraction techniques we refer to as ‘field methods’ to a more active, participatory, and nature-attuned style of communicating.

which has also proven to be true for our project. The collaboration with different disciplines and community members will tailor science in ways that are beneficial for everyone and have a broader impact on the environment and social groups.

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Notes

1. Wixárika is considered to be endangered (Conti, Guerrero and Santos, 2012), based on Drude and UNESCO’s (2003) language vitality and endangerment parameters.
2. Gabriel Pacheco Salvador (Departamento de Estudios de Lenguas Indígenas at Universidad de Guadalajara, Mexico) and Tutupika Carrillo De la Cruz (Programa de Lingüística Aplicada at Universidad Autónoma de Nayarit, Mexico).
3. Alex McAlvay (Institute of Economic Botany at New York Botanical Garden).

4. Stefanie Ramos Bierge (Institute of Economic Botany at New York Botanical Garden).
5. Pablo Carrillo Reyes (Departamento de Botánica y Zoología at Universidad de Guadalajara, Mexico).
6. Universidad Autónoma de Nayarit, Universidad de Guadalajara, and Columbia University.
7. Wixárika students from Universidad Autónoma de Nayarit and Universidad Autónoma de Aguascalientes; students from the department of Ecology, Evolution, and Environmental Biology at Columbia University and the Applied Linguistics Program at Universidad Autónoma de Nayarit.
8. *Xatsitsarie* means 'sacred word' (Guadalupe Ocotán) while *Tiwetia* means 'under the tiger' (Cerro de los Tigres).
9. The Wixárika people inhabit the Mexican states of Jalisco, Nayarit, and, to a lesser degree, Durango and Zacatecas. Among their communities, those with the most significant populations include Tateikie (San Andrés Cohamiata, Jalisco), Wautia (San Sebastián Teponahuaxtlán, Jalisco), Tuapurie (Santa Catarina Cuexcomatitlán, Jalisco), Tutsipa (Tuxpan de Bolaños, Jalisco), and Xatsitsarie (Guadalupe Ocotán, Nayarit) (Solanes Carraro and Vela Ramírez, 2000). Within the context of this analysis, the term 'community' is defined not merely by its geographical setting but encompasses the unique cultural identity shared across the Wixárika communities (Sampson, 2001; Hall, 2009; Vaughan, 2011; Mahar, Cobigo, and Stuart, 2013; Miller, 2022). According to the latest report from the Instituto Nacional de Estadística, Geografía e Información (INEGI) in 2020, there are approximately 48,000 Wixárika speakers.
10. PAW was an initiative to promote interdisciplinary research where conferences and workshops were organized. This initiative was set up by Candide Simard (University of Fiji), Cedar Green (University of Newcastle, Australia), Sophie Mu (SOAS), Ebany Dohle (Language Landscape) in collaboration with Raj Puri (University of Kent) and Andrew Gosler (University of Oxford).
11. The Open Access movement promotes free and unfettered access to research publications and, increasingly, to the primary data that underlie those publications (Seyfeddinipur et al., 2019: 546). The chronological overview of the Open Access Movement can be found at <https://legacy.earlham.edu/peters/fos/timeline.html>.
12. <http://www.delaman.org/>
13. <https://www.elararchive.org/>, <https://ailla.utexas.org/>
14. <http://site.uit.no/trolling/about/>
15. The Belmont report includes ethical principles that should underlie the conduct of biomedical and behavioral research involving human subjects and developing guidelines to ensure that such research is conducted in accordance with those principles.
16. The Declaration of Helsinki (2013) is a statement of ethical principles for medical research involving human subjects, including research on identifiable human material and data.

17. The Convention on Biological Diversity is dedicated to promoting sustainable development.
18. The Nagoya Protocol (2010), on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS), is a supplementary agreement to the Convention on Biological Diversity. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. This includes traditional knowledge (TK) associated with genetic resources.
19. The Code of Ethics acknowledges that biological and cultural harms have resulted from research undertaken without the consent of Indigenous peoples. It affirms the commitment of the International Society of Ethnobiology (ISE) to work collaboratively, in ways that: support the community-driven development of Indigenous peoples' cultures and languages; acknowledge Indigenous cultural and intellectual property rights; protect the inextricable linkages between cultural, linguistic, and biological diversity; and contribute to positive, beneficial, and harmonious relations in the field of ethnobiology.
20. <https://mukurtu.org/>
21. See Czaykowska-Higgins (2009) for a detailed description on the different frameworks related to this continuum in the field of linguistics: Linguist-centered research, Advocacy Research, Empowering research, and Community-based language research.
22. Community engagement in research has been explored in other social sciences; while it is beyond the scope of this article, interested readers can consult Stoecker (2003, 2012), Greenwood (2008), Stoecker and Beckman (2014), Bradbury (2015), and Chambers (2020).
23. See Crippen and Robinson (2013) for an opposite view discussing that collaboration is not encouraged as a universal practice in the field of documentary linguistics.
24. Examples of funding options can be consulted in: <https://livingtongues.org/funding-opportunities/>.
25. Anishinaabe (other variants include Anishinabe, Anicinape, Nishnaabe, Neshnabé and Anishinabek) refers to a group of culturally and linguistically related First Nations that live in both Canada and the United States, concentrated around the Great Lakes. Consulted in: <https://www.anishinabek.ca/education-resources/gdoo-sastamoo-kii-mi/who-are-the-anishinaabeg/>.
26. *Asamblea* is a monthly meeting carried out by the local government to discuss different topics related to the members of the community.
27. CELINAY stands for *Centro de Estudios en Lenguas y Culturas Indígenas de Nayarit* (Center for the Study of Indigenous languages and cultures from Nayarit).
28. University Autonomous of Nayarit, University of Aguascalientes, and Universidad para el Bienestar Benito Juárez García in Guadalupe Ocotán.

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Folkbiology in endangered languages: Cognitive universals and lexical relativity

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Abstract

Predominant theories of folkbiology emphasize universal aspects of human perception and cognition but have often been contested by research emphasizing cultural relativity. Drawing on languages that encode knowledge of endangered ecosystems, this paper argues that the contrast between universalist and relativist approaches to the folk classification of living kinds is a false dichotomy: despite the existence of cognitive universals based mostly on visual perception, there is abundant evidence that the lexical semantics of words and phrases denoting particular taxa and their relation to overt cultural expression vary cross-linguistically. Recent calls for the indigenization of knowledge highlight the need to illuminate parallel and complementary knowledge systems in line with efforts to decolonize academic research. I present a range of examples from Indigenous taxonomies that provide lexical windows into local ecology and belief systems and propose an analysis by which (i) universalist and relativist perspectives are not in conflict and (ii) Indigenous naming systems are of comparable social and scientific value to Western taxonomies. More generally, I suggest that a more comprehensive understanding of the linguistics of folkbiology is possible by moving beyond binary thinking in this domain.

Keywords: endangered languages, ethnobiology, folkbiology, lexical semantics, Traditional Ecological Knowledge (TEK)

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1 Introduction

In this paper, I contrast universalist and relativist approaches to the folk classification of living kinds (e.g., mammals, birds, reptiles, insects, plants, etc.) from a linguistic perspective, with a focus on endangered languages in endangered ecosystems. While this controversy once burned brightly in ethnobiology, it has receded into the background in contemporary research, and it is perhaps time to poke the embers. As Indigenous languages continue to go extinct in the most biodiverse regions on the planet, at a rate of one disappearing every two weeks, the question of what is universal and what is unique about naming systems for living kinds remains fundamental. Before plunging directly into debate, it is useful to reconsider in the most general terms the relationship between names and things.

There is a long tradition of emphasizing that there is no intrinsic link between the sounds chosen in a particular language for a particular word and the thing, event, or state in the world that the word represents. This perspective was advanced by Aristotle (Modrak, 2001), rearticulated in the early twentieth century by Saussure (1983 [1916]), and largely goes unquestioned in mainstream linguistic research. As Juliet intoned on her moonlit balcony, with Romeo hidden below in the shadows, ‘What’s in a name? that which we call a rose / By any other name would smell as sweet’ (Shakespeare, 1986: 43–44). In an important sense, Juliet is correct. The name of this genus of flower does not affect our perception of its smell; similarly, our perception of its physical shape, usually comprising five petals, each divided into two lobes, and its thorny stem, with sickle-shaped hooks, is entirely independent of the linguistic label we attach to it, whether it be *rosa* in Italian, *méiguī* in Mandarin, or *waridi* in Swahili. From this perspective, it might seem that any object names in different languages should be fully interchangeable.¹

However, as Rosaldo (1972: 83) observes, ‘words often signify a good deal more than the objects designated as their referents’. ‘What’s in a name?’ remains a prickly question in part because of the difference between sense and reference. As Frege (1980 [1892]) famously observed, the reference of a word is what it denotes, and it is external to the mind, while the sense of a word is its meaning in relation to the linguistic system of which it is a part. For example, the folk names *foxglove*, *witch’s glove*, *fairy fingers*, and *dead men’s bells* might all refer to the same plant (*Digitalis purpurea*), but they carry different senses. Contrary to Juliet’s conjecture, many names of plants and animals across cultures do contain information as to the nature of the thing itself, whether it be the shape, the edibility, the medicinal value, the toxicity, or some other noteworthy characteristic. If she were to have left her home in Verona to wander in the hills

of Northern Luzon in the Philippines, she would surely have been confused by the names bestowed by the Ilongot people upon the many varieties of sweet-smelling orchids. As documented in fieldwork by Rosaldo (1972), the generic term corresponding to 'orchid' is *lampun*, though that is, properly speaking, the name of the 'spirits of high places' invoked in magic spells to cure certain kinds of sickness. Types of orchids have names such as *quduṅde* 'their thighs', *lukipe* 'their fingernails', *sinayakde* 'their braids', *qamaqamade* 'their thumbs', and *ge:lawagide* 'their fingers', and as such are conceptualized as being body parts of the spirits. As part of a steaming cure, a patient sits under a blanket with a pot containing a boiling botanical mixture, to which particular orchids are added. Through steaming, the assembled body of the spirit enters the body of the patient and is asked to lift the curse of sickness. Clearly, there is a tension between Juliet's affirmation of the universality of human perception and the culturally modulated onomastics of the Ilongot. An orchid by any other name would not be part of the same cultural world.

In the following sections, I first consider the impressive body of research on universals in the lexical encoding of folkbiology and acknowledge the legitimacy of research on language and ecology that sheds light on common aspects of human cognition. I then delineate some limitations of such research in terms of the fundamental relativity of word meaning inherent in the mental lexicon of any particular language. With such premises in place, I explore the implications of lexical relativity through a range of culture-specific examples of the classification of living kinds that resist translation into dominant majority languages and propose an analysis by which universalist and relativist perspectives are not in conflict. Finally, I suggest that previous iterations of this debate resulted in polarization or shoulder shrugging largely due to false dichotomies; the beauty of interplay between linguistic cognition and local ecological knowledge is revealed only when we move beyond simplistic binary distinctions.

2 Cognitive universals in language and folkbiology

Across theoretical frameworks in linguistics, research has tended to confirm the existence of at least some grammatical universals that give rise to patterns in culturally and geographically unrelated languages.² To a large extent, syntax and phonology are governed by cognitive principles common to all human beings and are independent of belief systems and ecological context. For example, in syntax, V2-languages (which require the second constituent of a sentence to be a finite verb) are found from the Northern European lowlands to the high mountain villages of the Himalayas, while serial verb constructions (which allow for

complex predicate formation) can be found in the Amazonian rainforest, the Kalahari Desert, and the streets of Beijing (Stringer, 2016). Similarly, in phonology, use of paired (geminate) consonants is found from Italy to Japan; stress-timed languages are found from the Faroe Islands to Thailand; and attempts to tie tone languages to climate have ultimately foundered on closer examination (Collins, 2016). Such findings relate to one major concern of the linguistic enterprise, which is to shed light on the underlying architecture that all languages have in common, such that any child is born with the capacity to learn any language with ease within the first few years of life. However, it can be argued that cultural and environmental influences on language lie predominantly not in syntax or phonology but in the mental lexicon, an equally important component of the human language faculty.

Parallel discussions concerning cognitive universals have also occurred in research on folkbiology. A consensus among anthropologists began to emerge in the 1960s that there was an unmistakable unity in the various naming systems of plants and animals in all human languages (see, e.g., Berlin, Breedlove, and Raven, 1973; Berlin, 1992; Atran, 1998). This cross-cultural, general-purpose taxonomy classifies living kinds in terms of the same three basic levels of organization: 1) unique beginner/folk kingdom (*animal, plant*); 2) life form (*bird, fish, mammal, tree, shrub*); and 3) generic species (*goose, trout, fox, willow, honeysuckle*); with the possible addition of more specific names for subtypes of generic species, involving binomial and then trinomial compound nouns: 4) folk-specific (*snow goose, rainbow trout, red fox, pussy willow, trumpet honeysuckle*); and 5) folk-varietal (*lesser snow goose, coastal rainbow trout, Cascade red fox, rosegold pussy willow, sulphurea trumpet honeysuckle*). The striking universality of the taxonomic hierarchy itself, as well as the typological regularity in the recognition of particular life forms and generic species, across so many different cultures and environments, can be most convincingly explained by commonalities in human perceptual cognition, independently of usefulness or cultural significance to humans.

That an innate universal ranking system underlies our classification of animate entities also finds support in children's inborn enthusiasm for categorizing living kinds such as humans, nonhuman animals, and foods such as fruit (Gershkoff-Stowe and Smith, 2004). Studies have shown that even children born in urban environments, somewhat disconnected from the natural world, will often seek out populations of nonexistent creatures to classify with eagerness and precision, whether they be dinosaurs (Yoon, 2009: 164–165) or artificial characters such as Pokémon (Balmford, Clegg, Coulson, and Taylor, 2002). The development of this domain of vocabulary also appears to unfold in similar

ways across languages. For example, as discussed by Brown (1984: 92–96), the acquisitional sequence for plant-related terms is largely the same for children acquiring both English and Tzeltal.

If humans are born with an intrinsic ability to classify animals and plants, then we might expect there to be evidence from research into the workings of the brain for a neural substrate underlying this capacity. In fact, through disease or trauma, patients can develop a domain-specific impairment for recognizing, ordering, and naming living things. While retaining the ability to distinguish inanimate objects, such patients seem completely stumped by things such as kangaroos, parrots, spiders, crocuses, or mushrooms (Yoon, 2009: 146–170). As the distinction between life and non-life underlies our knowledge of what is potential food versus what is inedible, the results of this condition can be catastrophic. While the patient J.B.R. was suffering from herpes-induced encephalitis, following a grand mal seizure, and unable to name camels or buttercups (while being able to describe flashlights and compasses), he tried to eat soap, paper, and blankets, and to drink shampoo (Greenwood, Bhalla, Gordon, and Roberts, 1983; for similar cases, see Silveri and Gainotti, 1988; Sheridan and Humphries, 1993). Patients exhibiting such symptoms all suffered lesions in the temporal lobe, and brain-imaging research on object-naming in healthy patients has revealed that the location of our capacity to recognize, order and name living kinds lies in the superior temporal sulcus and the lateral fusiform gyrus (Martin, Wiggs, Ungerleider, and Haxby, 1996; Van Schie, Wijers, Mars, Benjamins, and Stowe, 2005).

Despite the existence of universals in human cognition underlying both language and folkbiology, it remains paradoxically true that that, in various respects, ‘grammars are shaped by culture and environment’ (Harrison, 2007: 211), and that there are profound differences in folkbiological classification. The lexicon does not exist in isolation from grammar, and the meanings of words invariably diverge across languages, whether in productive vocabulary such as nouns and verbs or functional elements such as prepositions or classifiers. For example, grammatically relevant lexical features like HUMAN and ANIMATE, which are carried on nouns, play a role in the grammars of all languages. The presence or absence of the feature HUMAN can determine possible relative pronouns in English, e.g., **the book who I read last week*. Similarly, only entities classified as ANIMATE can be selected by the Japanese existential verb *iru* ‘to be’, e.g., *heya ni onna ga iru* ‘there is a woman in the room’ vs. **heya ni hon ga iru* ‘there is a book in the room’. In Diné (Navajo), basic word order depends not on subject vs. object, but on the positions of entities in a cosmic ladder of animacy, e.g., humans, lightning > children, bears > cats, eagles > ants, spiders

> wind, fire > trees, rocks > abstractions (thirst, age) (Young and Morgan, 1987: 171–172, drawing on Creamer, 1974). Thus, in any sentence about a boy (*ashkii*) and a dog (*lééchq̣q'í*), the boy will precede the dog, e.g., *ashkii lééchq̣q'í yi-noolchéél* ‘the boy is chasing the dog’ vs. *ashkii lééchq̣q'í bi-noolchéél* ‘the dog is chasing the boy’, with verbal prefixes indicating which participant should be interpreted as the agent in the event. However, while concepts such as HUMAN and ANIMATE appear to be universally available as grammatical features, what actually counts as human or animate may vary from culture to culture. In Ecuador, Achuar hunters conceptualize toucans and howler monkeys as brothers-in-law, while Achuar women talk to their plants in the village garden using a language of address otherwise reserved for children (Descola, 2013: 4–6). Not only animals but certain plants may be understood to have human-like souls. In Mali, Dogon healers consult trees to ask them about their knowledge of the forest, and some trees, such as the kapok (*Ceiba petandra*), are believed to move around at night, having conversations with other trees in the forest (Descola 2013: 27). In such cultures, the boundaries of social interaction extend beyond the human. People have considerable choice in how they conceptualize the outside world and whether they perceive a separation between humans and other animals, between animals and plants, or between culture and nature.

3 Lexical relativity and ethnobiology in endangered languages

3.1 The gloss trap

The documentation of naming systems in ethnobiology is enhanced by the assumption that names in two languages are likely to have different senses, even if they share the same referent. In advance of an analysis of relativity in the classification of living kinds, it helps to situate the discussion in the context of the general impossibility of literal translation. Lexical relativity is a fundamental organizing principle of human language by which the precise meanings of words depend fundamentally on the existence and particular semantics of other words in the same lexicon and are systematically different across languages (Stringer, 2010, 2019). While supposedly equivalent words in different languages can denote the same entities in the world, the shared denotation in effect never applies across all contexts as there are differences in extension (the precise set of entities the word can describe), polysemy (related meanings captured by the same word), and connotation (such as positive or negative nuances). When linguists create word-for-word literal translations, called glosses, to facilitate comparative syntax, this often leads to a ‘gloss trap’, as assumed equivalences fall apart on closer examination.

For example, a universal human activity such as drinking does not lead to universal verb semantics. The English verb *drink* is used only of liquids. In Turkish, one can also drink smoke (as in *drink a cigarette*), as the verb subcategorizes liquids and gases; in Japanese, one can drink medicine, even in solid form; and in Kazak, one can drink both liquids and solids, in contexts where English would require the verb *eat*. Young and Morgan (1987) list fifteen verbs of consumption in Diné, corresponding to either *eat* or *drink*, which differ according to such criteria as whether the thing to be consumed is hard, mushy, leafy, liquid, solid but dunked in liquid, or meat, or whether it is consumed from an open or closed container. Similarly, common nouns splinter in translation: English *rice* corresponds to both Japanese *kome* ‘uncooked rice’ and *gohan* ‘cooked rice’. In English, *grape* is a count noun (and grapes are conceptualized as small, bounded objects) while in French, *raisin* ‘grape’ is a mass noun (and conceptualized as an aggregate). In French one must refer to a grain of grape, just as in English one must refer to a grain of rice. The myth of lexical equivalence is especially apparent in research that focuses on comparing any two specific lexicons in detail. When Wierzbicka (1985) attempted to provide complete semantic descriptions of common English words, she was not able to find an exact match with a single one of their analogues in Polish: something is lost even when translating names for commonplace objects as *cup* or *shirt*. With such examples in mind, we can see that lexical relativity bears directly on the nature of translation in ethnobiology. A shift from one lexicon to another entails thousands of subtle shifts in how we conceptualize names of living kinds in order to talk about them.

3.2 Relevance for ethnobiological research in endangered cultures

An understanding of lexical relativity can greatly inform our sense of what else is lost when a language is lost; what is gained when language use is rekindled; and how language revitalization might play a role in the preservation of Traditional Environmental Knowledge (TEK). It is well-understood that most of the world’s Indigenous languages are spoken in geographical regions with extremely rich variation in languages (many of which are endangered) and populations that display a high degree of multilingualism (Harrison, 2007; Evans, 2022). These zones of language complexity overlap significantly with biodiversity hotspots, similarly defined in terms of a multiplicity of threatened species (Gorenflo, Romaine, Mittermeier, and Walker-Painemilla, 2012; Loh and Harmon, 2014). It follows that when ethnobiologists conduct research in some of the most biodiverse places on earth, it is invaluable to have an understanding of the TEK that is linguistically encoded by communities often at risk of either displacement, acculturation, and, in many cases, partial or complete language loss.

That culture-specific vocabulary and grammar related to ecology is at risk of catastrophic loss if a community shifts to a dominant language is no mere hypothetical. In Venezuela, Jotí children living in a traditional forest habitat have a knowledge of ethnobotany similar to their parents by age 10, including names of up to 220 edible and 180 medicinal plants, but those who have shifted their language dominance following acculturation in mission villages exhibit dramatic loss of such knowledge (Zent, 2009). Similarly, one study involving 6,190 high school students with 392 Indigenous languages in Papua New Guinea found that, in a single generation, there was a tragic vanishing of lexical items denoting birds, closely correlated with language shift (Kik et al., 2021).

In light of lexical relativity, it is clear that conventional attempts to salvage ethnobiological knowledge by creating bilingual word lists of supposedly equivalent vocabulary may in fact be counterproductive, as this practice encourages people to see words only in terms of reference and not sense, thus devaluing Indigenous taxonomies. More sophisticated initiatives have embraced a biocultural perspective, embedding lexical information in cultural contexts. For example, the Kimberley Language Resource Centre in Australia has gone beyond 'just a list of words in publications' for ethnobotanical vocabulary (Maffi and Woodley, 2010: 62) by creating audio and visual materials in local languages such as Jaru and by creating opportunities for language immersion for young people on trips to the bush. In Colombia, the ecological and cultural restoration of the sacred site Jaba Tañiwashkaka over the past decade has been led by an intercultural team of Kogui community members and staff members of the Amazon Conservation Team (ACT). This has made possible both the recording of the names and oral histories of species in the Kogui language to preserve this knowledge for future generations, in parallel with Western scientific documentation and ecosystemic analysis (Hoffman, Londoño, Velasquez, and Plotkin, 2023). Other recent ethnobiological projects that meaningfully engage with the linguistics of Indigenous taxonomy include Rapinski, Cuerrier, Harris, Ivujivik, Kangiqsujuaq, and Lemire's (2018) study of Inuit knowledge of marine organisms in Nunavik, and Hidayati, Franco, and Suhaimi's (2022) research on Urang Kanekes ethnobotany in Banten, Indonesia.

Despite increasing recognition of the imperative to value Indigenous knowledge as on a par with scientific scholarship, much current biocultural research remains largely guided by Western preconceptions, such as how a more complete understanding of language variation will help complete the picture we already have of human cognition or how traditional ethnobotanical practices can point to alkaloids that can be synthetically reproduced for medical use (and monetization). Indigenous academics, who have bridged the divide between emic and

etic ways of knowing, continue to argue that we remain in need of a paradigm shift so that, for example, collaborative linguistic work should have at its heart Indigenous needs, goals, values and cultural norms (Leonard, 2021). Similarly, biological science stands to gain from a ‘dance of cross-pollination’ with Indigenous knowledge, potentially making possible ‘a new species of knowledge, a new way of being in the world’ (Kimmerer, 2013: 47). Fundamental to this endeavor is a willingness to engage with language. In Mika’s (2016) discussion of Māori linguistic philosophy, he explores the connection between language and worldview, and describes language in terms of ‘the worlding of things’ (p. 165). This expression captures the insight that we understand the world not only as we perceive it but as we describe it in our languages, leading to pluriversal epistemologies. Indigenous conceptualizations and classifications of living kinds exemplified in the following section reveal how the lexical encoding of ecological knowledge in natural languages is often culture-specific, ecosystem-dependent, and able to provide unique insights into the behavior, ecological roles, utilitarian value, and cultural significance of animals and plants.

4 The cultural classification of living kinds

4.1 Linguistic encoding of ecological and utilitarian knowledge

When animals or plants have high cultural significance in a particular community, this can result in sophisticated folk classification. Posey (2002) documents how the Kayapó of Brazil distinguish 56 types of bees, grouped in 15 families. Names for bees can depend on behavioral characteristics (e.g., flight patterns, aggression, sound in flight, places typically visited), nest geometry, and ecological niche (e.g., preferred nest site, position of entrance, characteristics of the entrance structure, whether found in flood forest, humid forest, or savannah), physical characteristics (e.g., shape, color, smell, markings, type of wings, secretions), or use to humans (e.g., quality and quantity of honey, quality of resins or wax, edibility of pollen or larvae). Such naming systems, based on observation in a particular ecological context, are arguably more relevant to conservation efforts than scientific nomenclature.

Similar examples of naming according to utilitarian value or environmental location are found across languages. Utilitarian classification is found with butterfly and moth larvae in Tzeltal, Mexico (Hunn, 1977: 280–285, 301–306), and reindeer naming in Todzhu, Siberia (Harrison, 2007:30). Environmental location is encoded in plant naming by the Cherokee of North Carolina, in which folk-specific varieties are binomial, including words such as *igatenehi* ‘swamp-growing’, *gutluta* ‘living on hillsides’, and *kutlaehi* ‘growing under beech trees’

(Cozzo, 2002: 143–144). It is important to note that any human language has the capacity to encode detailed utilitarian or environmental information. For example, in English there is specialized folk terminology in horse breeding or falconry (e.g., a *gelding* is a castrated adult male horse, three years or older; a *brancher* is a young hawk, almost completely feathered, not completely capable of flight). However, the fact remains that such naming systems are culture-specific and often endemic to particular ecosystems. As such, the loss of a language may entail the loss of vital, regional TEK.

Environmental information may be carried not only on common nouns but on grammatical morphemes attached to vocabulary items. One such system is found in Piaroa, spoken in Venezuela. Immediately following the noun there is a classifier position that must be obligatorily filled, with few exceptions. There are over one hundred noun classifiers, about seventy-five of which specify botanical or ecological information about the noun to which they are attached. For example, the addition of *-roe* classifies the object as a kind of hanging, branching-stemmed fruit bunch; if *-k'oe* is used, the object is understood to be a rosette-shaped herbaceous plant; and if *-ya* is added, the substance is categorized as a thin, free-flowing sap (Zent, 2009: 106–107, drawing on Krute, 1989). Sometimes the classification of nouns is not marked directly on the noun itself but on numbers when nouns are counted (Aikhenvald, 2003), and such classifiers may also encode ecological information. In Minangkabau (Indonesia), numerical classifiers are used to differentiate between seed-like objects (marked with *incek*), flowers or leaves with stalks (*tangkai*), and clumps of plants (*kalupah*), while Baniwa (Northwest Amazonia) has a special numerical classifier (*-fa*) for types of excrement, because of the importance of identifying animal droppings when hunting game. Such systems are lost when speakers switch to languages less rooted in the local environment.

Yet another type of ecological information encoded in endangered languages concerns the changing of the seasons. Many Native American tribes have their own set of month names related to hunting, fishing, gathering, or planting activities in particular ecosystems. The equivalent of April is *iskigamizige-giizis* ‘Maple Sugar Moon’ in Ojibwe, *wahsakayu:té:se* ‘Thundering Moon’ in Oneida, *maǵá okáda wi* ‘Geese Laying Eggs Moon’ in Dakota, *hash bissi* ‘Blackberry Moon’ in Choctaw, and *guwoni* ‘Duck Hunting Moon’ in Cherokee. Seasonal cycles may be defined not only in terms of human interaction with other species, but the behavior of the animals or plants themselves. For example, the whole annual cycle is named by the Karajá people of Brazil in terms of the behavior of two local species of turtle (Fortune, 1990).

It seems evident from these culturally modulated examples of the linguistic encoding of ecological knowledge that universals in folkbiology are not the whole story, and the choice between universalism and relativism must be based on a false dichotomy. Part of the solution lies in the fact that humans are not restricted to a single system of classification, whether of living kinds or of calendar cycles. The following two subsections consider in turn the phenomena of parallel taxonomies and fluidity in classification within a single system.

4.2 Parallel systems of classification

One fundamental flaw in the assumption that folkbiology can be reduced to a single universal hierarchy that matches Western classification systems may be illustrated by reconsidering the influential classroom experiment discussed by Berlin (1992: 9–10), involving the categorization of birds. American students were asked to sort out a pile of unfamiliar, colorful museum skins from the Peruvian Amazon, including two or three examples of each species. They instinctively and reliably reproduced the groupings used by both biologists and the Huambisa and Aguaruna Jivaro peoples who were the source of specimens, which is almost certainly indicative of universals in human visual cognition. This has been taken to confirm the validity of a single, universal folkbiology. However, students could not possibly have classified these unknown species, displaced from their natural environment, in any of the other ways that people group living kinds: in terms of their ecosystemic significance (the food they eat, their association with other species, the seasonal changes they herald), or utilitarian value to the community (the uses of their feathers, their edibility, their ability to indicate other sources of food), or the sounds they make.

That Indigenous peoples have naming systems based on visual perception that correspond to those of ornithologists does not preclude the possibility of parallel systems of classification. In his classic account of his fieldwork with Kaluli people in Papua New Guinea in the 1970s, Feld (2012: 46–60) documents how there is, as expected, a bird classification system based largely on appearance, including familiar groupings. But at one point in Feld's narrative, his informant, Jubi, becomes frustrated and exclaims, 'Listen – to you they are birds, to me they are voices in the forest' (p. 45). The emphasis on sound is relevant not only because people perceive and recognize birds in the forest primarily through this medium, but also because these may actually be the voices of human ancestors: when villagers die, their souls enter the bodies of birds. The sounds themselves have an outside, which can be used to identify the species, and an inside, which can be understood as spirit communication. The Kaluli in fact distinguish seven groupings based on sound: those that say their names

(*ene wi salan*); those that make a lot of noise (*mada ganafodan*); those that only make sound (*imilisi ganalan*); those that speak the Bosavi language (*Bosavi to salan*); those that whistle (*holan*); those that weep (*yelan*); and those that sing *gisalo* song (*gisalo molan*).³ Systems of animal and plant classification that run parallel to taxonomies based on visual cognition often crosscut biological genera. In Cherokee plant taxonomy, intermediate taxa include the grouping *gaw-suki* 'smeller', which are strong-smelling plants, including mints, spicy scented herbs, and muskmelons (14 species, 10 genera, 4 families). Another is *unistilusti* 'stick flat to hairy substance', which are all plants with burrs (15 species, 13 genera, 8 families) (Cozzo, 2002: 141–142).

It should be clear that parallel systems of classification apply to folkbiology in any language, not just Indigenous languages under pressure of language shift. In English, classifications such as crops, flowers, and weeds are examples of variable systems of folkbiology, utterly independent of scientific taxonomy, depending on cultural evaluations of what is considered plantable, beautiful, or useless. Animals may be also classified in parallel groupings, whether in terms of use, such as pets (guinea pigs, goldfish) or farm animals (chickens, cows); or location, such as sea creatures (shark, octopus). This is particularly evident in food practices: tomatoes and avocados are usually conceptualized as vegetables (and categorized as such on supermarket shelves) while technically considered fruit; the folk term *berries* subsumes strawberries and raspberries, which are not, botanically speaking, berries, and usually excludes botanically defined berries such as chili peppers and watermelons. Parallel systems of classification stand in contrast to the narrow scope of approaches that emphasize universals in taxonomy based only on physical form. Alternative taxonomies appear to exist in conjunction with universals in all languages. However, there is a further layer of complexity, as languages also allow for variation inside a single classificatory schema.

4.3 Fluidity within naming systems

In addition to switching between alternative taxonomic systems, languages allow for fluidity in classification *within a single naming system*, for at least two reasons: first, because entities in the world may be conceptualized in different ways; and second, due to naming taboos. Alternative conceptualization in the same naming system is arguably found in all languages. For example, while some English nouns are invariably count or mass (such as the count noun *grape*, discussed above), the same turkey displayed on a table may be linguistically encoded as either *a turkey* or *some turkey* depending on whether the speaker conceptualizes it as an object or a substance. This kind of choice in how we

classify is found not only in grammatical function words but also in open-class vocabulary. As noted by Atran (1999: 194–195), English speakers use the term *animal* to refer to at least three different classes of living kinds: animals including humans, animals not including humans, and mammals as prototypical animals (for instance, when people contrast animals with birds). In similar fashion, the term *plant* can refer to the whole plant kingdom or just to smaller leafy plants that are not trees.

Fluidity in reference to folk species can also arise due to taboos associated with naming people whose personal names derive from animals or plants. In many Australian languages, there is a taboo on naming a deceased person for a period of time, and in such cases the taboo extends to related names referring to animals, plants, or the environment. If a man is named *Yab-woorack* ‘woorak leaf’ because he was born under a *woorack* ‘banksia’, then the plant itself must be temporarily referred to by a different name following that person’s death (Clark, 2007: 17–18). As many cultures extend the concept of the soul to animals and plants, this kind of pronunciation taboo can also be found in dealings with other species. For Pälawan people in the Philippines, the collecting of honey involves complex negotiations with the spirit world. Humans are understood to inhabit the middle realm of a universe with three levels. Bees are said to be creatures of the upper world, seasonally descending to gather pollen from flowering trees. In order to attract bees, people must enter into negotiation with the Master of Flowers and perform appropriate ceremonies so that the trees welcome the bees. When the relevant trees are in flower, people are prohibited from using their normal names, such that these trees all have alternative names. For example, the *natuq* tree (*Payena* sp.) becomes *bäbäqälän*, the *dipanga* (*Pometia pinnata* Forster) becomes *kärän kärän*, and the *ginuqu* (*Koompassia excelsa* Taub.) becomes *pagibutän*. This is parallel to the practice of avoiding names for elders in this community, who must be respectfully referred to as grandfather or grandmother (Novellino, 2002).

4.4 Classification modulated by belief systems

The bestowing of personhood on birds in Kaluli culture and on trees by speakers of Pälawan, as discussed above, reveals not only parallelism and fluidity in naming systems but also how belief systems are intertwined with the language of ecology. The literal personification of an animal or plant may influence performative expression, whether in recited narratives, songs, festivals or more discreet rituals involving hunting or gathering. When a Pälawan gatherer needs to fell a gumbja sago palm, he must enter into ritual battle (Novellino, 2002). He wears a warrior’s headband and must first go through the motions of

a duel, using a bush knife to fight the tree, whom he addresses as *käläng taw* ‘Big Man’. After the tree has been felled, he takes up a spear and thrusts it into the trunk while shouting that the Big Man is finished. Comparable prescriptions of behavior can be found not only with plants and animals but also with the larger ecosystem if, for example, a whole forest is personified. In various cultural groups in Siberia, a hunter must forge an alliance with the Spirit of the Forest before venturing on an expedition by having sex with the Spirit’s daughter in dreams (Descola, 2013:18). The belief that the soul can travel during sleep means that this relationship is not just imaginary for the hunter, who must also refrain from intercourse with his wife during this period (a kind of non-performative expression).

Nonhuman personhood may also be ascribed to the spirits of rivers, or mountains, or demarcated natural regions. While not news to Indigenous people around the world, the idea of environmental personhood has gained wide recognition in academia, law, and politics in recent years, following several successful attempts to petition governments to grant juristic personhood to environmental entities: Te Urewera and Te Awa Tupua (the Whanganui River) in New Zealand (legally recognized in 2014 and 2017, respectively); the Atrato River in Colombia (2017), the Ganga River Basin (2017) in India; as well as recognition of a more all-encompassing spirit of Pachamama in Ecuador and Bolivia (Act of the Rights of Mother Earth, Ecuador, 2008; Law of the Rights of Mother Earth, Bolivia, 2010) (for comparative discussion, see Gordon, 2019). As Studley (2019: 70) makes clear in his analysis of ecology and mountain religions in Tibet, conservation in such cases cannot be abstracted from the Indigenous reality of humans being part of nature, with the ideal of *snod bcud do mnyam*, ‘topocosmic equilibrium’, between various life forces. All these examples involving animals, plants, and landscapes point to a simple truth: that the basic dichotomies of human versus nonhuman, or culture versus nature, so often assumed in linguistics and biology to be universally applicable, are in fact subject to cultural relativity.

5 Conclusion

Returning to the question of commonalities and cultural particulars in the linguistics of folkbiology, it seems clear that dichotomous thinking itself, so fundamental to Western philosophical and scientific argumentation, is part of the problem. There is a belated but growing awareness in both the linguistics and ethnobiological academic communities that conventional models of research with binary divisions between universality vs. relativity, science vs. Indigenous

beliefs, and academics vs. informants, must be rigorously challenged as the academy itself is decolonized. In linguistics, the once-heated debate between those who seek to understand universals of language and those see language as a window into individual cultures has resulted in two halves of the field, each working semi-independently while disparaging the other (see e.g., Pinker, 2007, and McWhorter, 2014, skewering neo-Whorfianism; and Deutscher, 2010, and Evans, 2022, on how Chomskian linguistics is little more than intellectual moonshine). In ethnobiology, following a no less impassioned history of debate (see, e.g., Berlin, 1992; Ellen, 1993), the opposition between these different perspectives has not split the field but, to the contrary, has been accurately acknowledged as a productive tension and shifted into the background of current research.

Arguably, however, there remains in ethnobiology a need to fully recognize the positive potential of linguistic analysis to shed light on the cultural classification of living kinds. The encoding of ecological knowledge in the nominal domain (nouns, numerical and possessive classifiers, lexical relations, etc.) and the verbal domain (verbs, affixes, subcategorization, etc.) results in a series of ciphers that only have meaning for particular communities in their own social, cultural, and natural environments. Any sharing of Indigenous ecological knowledge must be with an understanding of and respect for lexical relativity: the axiom that the meanings of words are endemic to the language in which they are ensconced. An additional issue for bilingual ethnobiological research is that our shared cognitive architecture makes possible parallel systems of classification, subsuming not only perceptual, utilitarian, and ecological criteria but also fluidity of classification within systems, involving shifts in conceptual perspective or transient cultural taboos. In the context of the current global experience of mass extinction of both languages and species, it is broadly understood that there is a pressing need for greater interdisciplinary efforts in linguistics and biology to promote biocultural diversity conservation. A keen awareness of lexical relativity can only benefit such efforts.

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Notes

1. The concept of the arbitrary nature of the sign is not to be equated with the notion that languages do not contain sound symbolism, as suggested by an anonymous reviewer. There is nothing whatsoever about /r/, /oo/, or /z/ (or the unrelated phonemes in *méiguī* or *waridi*) that points to the flower; but this does not preclude, for example, the use of voicing or vowel height to convey degree or duration (on mimesis in language, see Stringer, 2011; for discussion of sound symbolism in folk taxonomy, see Berlin, 1992: ch. 6).
2. Some linguists insist that universals of grammar stem from an innate language faculty (e.g., Jackendoff, 1990), while others maintain that they arise as part of general cognition (e.g., Talmy, 1985), but almost all linguistic frameworks accommodate the existence of universals. That researchers in other fields of inquiry such as cultural anthropology sometimes dismiss all accounts based on shared mental architecture is not at issue here.
3. Note that this fundamental classification by sound seems to contradict Berlin, Breedlove, and Raven's (1973) relegation of such systems to 'special-purpose' folk-biological classification, in contrast with the 'general-purpose' visual taxonomy shared by all humans. The previously discussed system of bee taxonomy in Kayapó also shows that different systems of equal importance can overlap in the naming of related species and families.

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Message plants of Southern Vanuatu

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Abstract

People in the southern Vanuatu islands of Aneityum and Tanna use plants as communication devices, a function which we call ‘message plants’. Certain species of plants are held, worn, or placed in specific locations with the intention of delivering messages with varied semantic content. In the cultural context of southern Vanuatu, message plants serve as an important parallel channel of communication, alongside spoken languages, and in some cases are considered more appropriate or effective means of conveying a message.

Keywords: ecosemiotics, environmental linguistics, ethnobotany, Vanuatu

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1 Introduction

Vanuatu is home to a rich diversity of plant life along with extraordinary levels of language diversity (François, Franjeh, Lacrampe, and Schnell, 2015). Across the archipelago, the Indigenous people of this country (known as Ni-Vanuatu) maintain a variety of ingenious uses for their local plants. Over generations, they have come to use plants for everything from foodways (Labouisse, 2016), medicine (McCarter and Gavin, 2015), art (Bonnemaison, 1996), and architecture (Coiffier, 1988), to clothing (Huffman, 1996), transportation (Aufray, 1996), music (Huffman, 1996), and weather magic rituals (Balick, Harrison, Kelso, Neriam, Noar, Plunkett, Ramik, and Wahe, 2022), to name just a few. One domain of plant use among Ni-Vanuatu that has received less attention is the use of plants as communication devices, which we call ‘message plants’ (Plunkett and Balick, 2017). We review prior literature from Vanuatu and elsewhere on the use of message plants as a form of symbolic communication and then identify 36 plant species (see Table 1 in Appendix 2) used to convey messages in communities from southern Vanuatu, along with their semantic content and social context. This ethnobotanical and linguistic study represents a multiyear collaboration with Ni-Vanuatu experts, three of whom (Dovo, Wahe, Neriam) are coauthors of this paper.

2 Background

The olive branch was adopted in ancient Greek and Mediterranean cultures as a symbol of peace that could be offered in physical form to a former enemy. The semantic content of the olive branch is now well enough established that no actual branch is needed to index the meaning, and it suffices to present an image of one or simply to use the phrase ‘olive branch’ in speech. Contemporary societies use plants or depictions of plants in a variety of symbolic ways. For example, the red poppy signals remembrance of war in the United Kingdom. Specific flowers used in exchanges and rituals have been understood – since antiquity and into the current era – to convey messages such as love, condolences, apologies, or congratulations (Doyle, Hanchek, and McGrew, 1994). In historical popular culture in the United Kingdom and the United States, the Victorian era (1837–1901) saw a surge of interest in ‘floriography’, and many books explicated the hidden meanings conveyed by flowers (e.g., Tyas, 1840; S., 1877; Greenaway, n.d.). Anthropological studies have documented similar uses and meanings in a wide range of non-European cultures. Some groups in Cameroon ritually plant certain species of grass at specific locations to mark

tribal land boundaries (Ngwa and Akara, 2019), and in St. Vincent, people plant *Cordyline fruticosa* (L.) A. Chev. to mark personal property boundaries and gravesites (Sheridan, 2016). On Woodlark Island in Papua New Guinea, the Muyuw people have an ‘extensive understanding and use of flora for depicting social/productive relationships’ (Damon, 1998: 67). For example, specific trees and the firewood gathered from those trees represent totemic groups in ritual exchanges. For the Muyuw, garden plants also model social relationships: for example, the intertwining of yam vines is understood metaphorically to represent marriage (Damon, 1998: 79).

Such uses of plants are a form of symbolic communication defined as: ‘the intentional communication, using learned, socially shared signal systems, of propositional information transmitted via symbols’ (Buck and VanLear, 2006: 522). Additionally, as Kull (2000: 328) points out: ‘the existence of plants as signs in human communicative systems’ also belongs to the emerging field of *ecosemiotics*, which explores the semiotics of landscapes.

Taking for a moment the perspective offered by ecosemiotics, we may distinguish three kinds of knowledge relating to message plants. The first kind, serving as the foundation for the other two, is everyday sensory interaction (olfactory, tactile, visual), which allows people to learn and identify plants by vernacular name and (folk) taxonomic classification. As Kull (1998: 354) notes: ‘The semiotic aspect of man-nature relationships may also include the distinguishing of species into useful and dangerous, into the familiar and the strange (or sometimes more classes) [...]’.¹ Plant nomenclature is particularly strong in Vanuatu: an average person encounters daily and can readily name hundreds of kinds of plants (including different varieties and forms of botanical species), while experts like coauthor Reuben Neriam know more than 1,000 plant names. Examples of this knowledge are represented in Appendix 2, Table 1, which lists 36 message plants by their local vernacular names (column 2), scientific names (column 3), and botanical collection numbers (column 4).

The second kind of knowledge – and the main focus of this paper – includes plants used as vehicles for symbolic meanings that are both intended by the sender and understood by the recipient. As Kull (1998: 351) notes: ‘Ecosemiotics [...] investigates human relationships to nature which have a semiosis (sign-mediated) basis [...]’. This kind of knowledge is represented throughout the paper and in the Appendix 2 (column 5). It extends beyond message plants to include other symbolic uses of plants, for example in weather magic (Balick, Harrison, Kelso, Neriam, Noar, Plunkett, Ramík, and Wahe, 2022), kava drinking rituals (Lindstrom, 1980), and decorative arts (Bonnemaïson, 1996).

The third kind of knowledge includes narratives that people in Vanuatu tell, either among themselves or to visitors, scientists, and others, about human relations to the plant world. Topics of these plant-centered narratives range from highly practical (e.g., architecture, foodways), to symbolic (e.g., magic rituals, messages), to mythological (e.g., origin stories). Through their performance, these oral narratives transmit cultural models that express the ni-Vanuatu philosophy of living in harmony with nature. As Noth (1998: 334) notes: '[M]ythological models of human ecology have been culturally transmitted in the form of narratives which instruct humans about their place in nature, telling them what they can, should, and must do with their natural environment'.

Knowledge of all three kinds (sensory, symbolic, and narrative) appears throughout this paper, and in Appendix 2. This knowledge was provided by the many experts named in column 6 of that Appendix (and by the three Ni-Vanuatu coauthors of this paper).

In Vanuatu, plants may convey specific semantic content (or 'propositional information') not by being mentioned by name or portrayed but by being carried, worn, and physically exchanged among persons, or strategically placed or planted by a person at a location. Some symbolic uses of plants in Vanuatu have been documented. Thaman (1992) describes cycads as markers of status, having many important ceremonial uses and associations, such as showing a person's rank, and displayed on Vanuatu's national flag. Thaman also suggests that cycads are used to convey messages and information but does not explain what those messages may be or how they are transmitted. Mescam (1989: 24) provides a detailed account of message plants from Pentecost Island, in northern Vanuatu. She notes that 'among the thousand and one uses to which they are put, there is one very special use, plants can mean something to the point of constituting a real language'. To provide a contrast with our own findings from the southern islands of Tanna and Aneityum, we summarize Mescam's key findings here:

(1) When someone cannot be present at a feast but was meant to offer boar tusks or a gift pig, he can instead provide the type of leaf that represents the length of the tusk that would have been given (and will be given). For example, *Inocarpus fagifer* (Parkinson) Fosberg equals a full circle tusk; while *Imperata cylindrica* (L.) P. Beauv. indicates the giver will later give a pig.

(2) *Maesa*; cf. *ambrymensis* Guillaumin, *Pseuderanthemum laxiflorum* (A. Gray) F. T. Hubb. ex L. H. Bailey, and *P. aubertii* Benoist leaves are signs of peace when carried in a belt.

(3) *Erythrina variegata* L. flowers represent blood: they serve as a declaration of war against the village where they are left.

(4) *Codiaeum variegatum* (L.) A. Juss. indicates that its bearer intends to kill. Leaves may also be left at a murder site (author does not specify by whom).

(5) ‘The leaves of a species of pepper shrub’ (exact species not identified by author) is planted to mark the place where the current chief’s ancestors lived and died.

(6) *Pterocarpus indicus* Willd. is left (location not indicated) to indicate that a person has borrowed kava or yams from someone else’s garden.

(7) *Cycas circinalis* L. [= *C. seemannii* A. Braun] leaves are placed to forbid entry to a house, or forbid access to a footpath or fruit tree.

(8) A type of moss locally called *lumtika* is placed at a potential garden site to remind someone trying to clear land for a garden that he has no right to, perhaps because he is from a different place.

Mescam (1989:25) concludes that this knowledge is vanishing: ‘The lore of these leaves and the information to be read from them is gradually dying out [...] the written language learnt by the young has taken its place’.

3 Methods

We are scientists affiliated with the New York Botanical Garden, and local culture experts in Vanuatu. Together, we are studying plants in this island country, along with their uses by the Indigenous peoples and their names in local languages. Vanuatu is a Y-shaped archipelago of 83 mostly volcanic islands, situated in the South Pacific between Fiji, New Caledonia, and the Solomon Islands. The population of 334,000 (United Nations Department of Economic and Social Affairs, 2022) speaks over 130 Indigenous languages (François, Franjieh, Lacrampe, and Schnell, 2015).

During our first two visits (in 2013), we met with community members on Tanna and Aneityum Islands in the far south of the country to gauge their interest in participating in the documentation of plants and plant uses (see Appendix 1, Figures 1 to 10). In many areas, we saw signs of a rapid erosion of such knowledge, where grandparents knew the traditional information, but their adult children, and even more so their grandchildren, had experienced a growing alienation from the natural world, especially as they became more dependent on modern approaches to life. In village after village, the elders expressed to us how they had been hoping and ‘waiting their whole lives’ for someone to help them preserve their plant knowledge in the face of aggressive pressures from modernization and globalization. In this paper, we share some of the results of our work with local people in Vanuatu, supporting their efforts at preservation and transmission.

Realizing that Vanuatu previously had no national checklist of its many plant species (see Plunkett, Ranker, Sam, and Balick, 2022; Plunkett, Ranker, Sam, Balick, and Ramik, 2022), we helped to initiate a project to document the kinds and uses of the plants found here. Building on a relationship we had forged with members of the Vanuatu National Herbarium (including curator Chanel Sam and the late assistant curator Philemon Ala) and the Vanuatu Department of Forests (coauthor Presley Dovo), we decided to start the project in the southern province of Tafea, where plant diversity is known to be especially great. We also discussed the project with the late Chief Jacob Kapere of the Vanuatu Cultural Centre, who put us in touch with the Centre's local branch in Tanna, the Tafea Kaljoral Senta (TKS), where we teamed up with field worker (and coauthor) Jean-Pascal Wahe. Since 2013, the Herbarium, Forestry Department, TKS, and the New York Botanical Garden, along with other groups, have been partners in a project we call (in Bislama, the country's national creole language) *Plants mo Pipol blong Vanuatu* (*Plants and People of Vanuatu*). We collected physical plant specimens to document the species at each site and for each use (Ranker, Balick, Plunkett, Harrison, Wahe, and Wahe, 2022). These specimens are pressed, dried, and mounted (along with labels providing information regarding habit, habitat, location, date, and names of collectors, inter alia), then deposited in herbaria to serve as permanent records of the raw data (part of a process known as specimen-based research). Besides collecting specimens, we elicit, record, transcribe, and analyze local names and cultural narratives shared with us by local experts about plants, their meanings and uses.

4 Findings

Mobile phones and social media are increasingly important for conveying information in the modern world, but in the traditional life of the people of Aneityum and Tanna Islands, before mobile phones became commonplace, plants played a critical role in daily communication. Coauthor Reuben Neriam, a local leader dedicated to preserving Aneityum *kastom* (traditional beliefs and practices), explained that in the times before the settlers and missionaries, people did not exchange greetings such as 'good morning' or 'hello'. Instead, if two men were to cross paths, one would step to the side and look down, so as not to disturb the other, who might be deep in thought about his garden or other important matters.

Likewise, it was considered disrespectful to deliver news of an important event, such as a birth or death, by telling another person directly what had happened. Instead, the bearer of good or bad news would find a stick from a particular plant species, cut it into small pieces (about 30 cm long), place these at the

entrance of the other person's house, and then leave. Upon finding the sticks, the other person would immediately know that a message was to be delivered, and he would go in search of the messenger and invite him into his home. Only after a polite conversation about other matters would the recipient finally ask if the messenger had some news to deliver. As Reuben Neriam explained, each region of Aneityum has a certain species that represents that tribe when delivering a message to someone from another tribe. The plant that signifies his area, the village of Anelcauhat, is a common coastal tree, *Hibiscus tiliaceus* L. (see Table 1 for details of all herbarium voucher collections). This plant is known as *buraō* in Bislama and *intoṽ hau* in Anejoṽ (the language of Aneityum) (Harrison, 2015).

Several other Aneityumese villagers from the area near Anelcauhat explained how some plant species may convey more particular messages. Local experts Wopa Nasauman, Yaiyaho Keith, Dick Matenekea and two brothers, Japanesai Lalep and Titiya Lalep, explained that several species of the small, fern-like genus *Selaginella*, known as *ngemas* or *necemas* in Anejoṽ (and as spikemoss in English), send a message that somebody has died. The messenger walks past someone with this plant in his hand or on his head, or sometimes hands it to the other person directly, prompting that person to ask the messenger the name of the person who has passed away. Reuben and Yaiyaho also explained that a small yellow daisy, *Wollastonia biflora* (L.) DC., known as *intoṽ asiej* or *intoṽ asiejora* in the Anejoṽ language, was placed on the doorstep of another person to indicate that he wished to break an agreement. Wopa Nasauman and Japanesai Lalep described how a particular species of grass, *Isachne comata* Munro ex Hack., known as *nautahs* in Anejoṽ, was used to send a message to a songwriter. When a musician received this plant, he recognized this as a request to compose a new song.

Sometimes the messages conveyed are connected to other uses of the plant. As Titiya Lalep explained, the small but beautiful fern *Schizaea dichotoma* (L.) Sm., known as *nirid u numu* on Aneityum, is often rubbed on a fishing line to help attract fish, instead of bait. Therefore, by extension, when the fisherman returns from a successful day in his canoe, he places this same plant in his hat as a signal that he caught some fish. He also described the several meanings that ground orchids of the genus *Spathoglottis* can have. Their beautiful flowers convey a sense of romance, as orchids do in many societies, and when a young man puts these flowers behind his ear or places them on a table, and then stares at a woman, he sends a subtle invitation that the woman should follow him. If he stares at another man instead, it is an invitation for the two men to meet in the *nakamal* (men's ceremonial area) to share some kava or to go for a swim together.

Titiya Lalep explained that another vine, a parasitic plant known as *inwou-ityuwun* (*Cassytha filiformis* L.), may be carried by a stranger from another village to convey the message that he is visiting in peace. The same message is conveyed by holding a branch of *Euodia hortensis* J. R. Forst. and G. Forst., a small tree or shrub with a strong, almost pungent fragrance, known as *masing* in Bislama and *inpa* in Anejoñ.

The beach-bean (*Canavalia rosea* (Sw.) DC.), called *nahajcǵi* in Anejoñ, is a low-growing vine with purple flowers that grows along the beach. Titiya Lalep explained that this plant is used to convey the message that a person would like to build a new house or establish a new garden at a particular spot. By wrapping this vine around a stick and placing it in the ground, that person signals that the area is *tabu*, or forbidden, and that other people should stay away. A similar *tabu* message is conveyed by placing cuttings of several *nawa* plants, *Polyscias guilfoylei* (W. Bull) L. H. Bailey, at different spots along a reef. This tells people that the reef in that area is 'blocked' – in other words, under a period of conservation or replenishment during which no one is allowed to fish.

In the Anejoñ language, the word *netupu* refers to all plant 'signs'. This includes calendar plants that tell you something about seasonal time by their flowering/fruitletting, etc. The same term covers message plants; plants that a person takes from somewhere else and either plants or places to convey a message.

On Tanna Island, message plants have uses similar to those from Aneityum. *Neure* (*Alocasia cucullata* (Lour.) G. Don) is used to mark the boundaries of one's land, and the leaves of *nakaimuap* (*Piper latifolium* L.f.) can be placed on or near a tree to enforce a *tabu* on harvesting its fruits. There is also a longstanding tradition on Tanna of creating head adornments out of wild plants to indicate a person's interactions with the forest. For example, a stem of *korwisiwhēru* (*Dendrobium mohlianum* Rchb. f.) with a flower woven into it indicates that its wearer has returned from the high-elevation forest.

Some messages may be conveyed by placement of plants but do not require any specific species to be used. For example, leaves may be placed on the trunk of a tree to signal that no one should pick fruits from this tree. If a gardener does not want people to walk through his garden, he can place two sticks in the ground, forming a large X, to indicate that the road is closed. The same is done to warn women not to enter or walk through a *nakamal* where boys are living after they have been circumcised. Plants used for this purpose may be wild cane stems (*Miscanthus floridulus* (Labill.) Warb. ex K. Schum. and Lauterb.), leaves of coconut or *Cycas seemanii* A. Braun, or any stick. If two people have

planned to walk together to a place but depart at different times, the person who departs earlier may place these leaves or any sticks along the side of the road to indicate to the second person which direction s/he is walking in.

5 Conclusion

The people of Vanuatu have a rich cultural history and an intense desire to maintain these cultural practices as living traditions, collectively referred to in Bislama as *kastom*. We adopt Lindstrom's (2020: 5) definition of *kastom* as the Ni-Vanuatu 'label [...] [for] festivals, along with any traditional or local practice, style, or belief'. But maintaining tradition in a rapidly changing and globalizing world can prove to be a great challenge. Message plants are an important part of Vanuatu *kastom* and are accompanied by a rich repertoire of orally transmitted knowledge.

The use of message plants in Vanuatu demonstrates the interplay between plants, people, and languages, with the added element of extralinguistic symbolic communication. Plants are vital to life in Vanuatu, and plant biodiversity is reflected in the local languages' rich vernacular nomenclature and taxonomies. Botanical knowledge is learned, remembered, and transmitted by local experts, many of whom do not even consider their ability to name hundreds of plants a remarkable feat. The persistence of plant knowledge is due in part to the extraordinary powers of memory possessed by people who live in oral societies, which is reinforced by their daily, practical use of the knowledge. In terms of communication, we all benefit from modern advances such as smartphones, text messaging, and social media, and these technologies are also used with increasing frequency in Vanuatu. But the immediacy of these modern methods is so often intrusive, even aggressive, especially when compared to the subtlety of traditional communication in Vanuatu, which highlights a gentler, more sophisticated, and more refined means of conveying messages with greater respect and dignity. We could all learn a few lessons from these great gifts of the ancestors.

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Notes

1. The latter part of this section reads: '[N]ational taxonomies provide many examples here (thus, a large part of ethnobiology happens to propose questions for ecosemiotics)' (Kull, 1998: 354).
2. Collection number (which includes collector's initials) is the system used by botanists for identifying herbarium voucher specimens: (MJB: Michael J. Balick; AAM: Ashley A. McGuigan; GMP: Gregory M. Plunkett). Links from the collection number to the C. V. Starr Virtual Herbarium are provided if available.
3. In the Aneityumese Dictionary (Inglis, 1882:101) *nieg* is defined as "a reed".
4. From *Dictionnaire du Netwar* (Ramík, 2015): '*nuig n* (terme générique) roseau, de ses tiges on fait les "kamo sit", "kamé piagen", cloisons et flèches "nowanparam". Dans ses feuilles on enveloppe les nouvelles ignames pendant "kamaru nuw". Parfois au soir on noue les feuilles des roseaux autour de la route pour "attraper" et arrêter le soleil, qui est en train de se coucher, quand on est en retard'. [Translation: '*nuig n* (generic term) reed, the kamo sit, kamé piagen, partitions and arrows *nowanparam* are made from its stem. The new yams are wrapped in its leaves during *kamaru nuw*. Sometimes in the evening, the leaves of these reeds are tied along the road to "catch" and stop the sun, which is setting, when we are late']. http://dominicweb.eu/en/lenakel/?lang=eng_tnl&type=info. Accessed July 2023.

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Appendix 1: Figures



Figure 1. Jean-Pascal Wahe, of Tanna Island, wearing a head adornment of various plants, including *Flagellaria indica* L., *Geitonoplesium cymosum* (R.Br.) A.Cunn. ex R.Br. and several fern species. (Photo by Presley Dovo).



Figure 2. Nasau Nalep, of Tanna Island, wearing ceremonial face paint and an armband of *Euodia hortensis*. (Photo by Michael J. Balick).



Figure 3. Chris Nevehev of Aneityum Island plaiting coconut (*Cocos nucifera* L.) leaves. (Photo by K. David Harrison).



Figure 4. Anselon Seru, in his outrigger canoe on the beach of Futuna Island, surrounded by beach-bean vines (*Canavalia rosea*). Every wooden canoe on Futuna Island has a specially carved shape on its upper stern that mimics the shape of a prominent rock at the canoe's home harbor. Upon seeing this shape carved on a canoe, local people understand where it belongs. (Photo by K. David Harrison).



Figure 5. Chris Nevehev (left) of Aneityum Island, prepared a *salusalu* (neck lei, of *Hornstedtia scottiana* (F.Muell.) K.Schum) and chaplet (*Kuanari*, of *H. scottiana*, *Euodia hortensis*, and several other species) to welcome linguist David Harrison (right). (Photo by Orien Namu).



Figure 6. Looped *nuig* (Netwar for wild cane, *Miscanthus floridulus*) leaf, tied in a knot and loop as pictured, as a sign to lead people to an umbilical cord burying ceremony. (Photo by Martial Wahe).



Figure 7. *Dendrobium mohlianum* (in Nafe language, *kwarwisiwir*, *GMP-4614*) a species of orchid used as a message plant indicating the wearer has traveled to a high forest. (Photo by Martial Wahe).



Figure 8. Left: *Cordyline fruticosa* (*MJB-4819*) used to mark boundaries on Tanna Island, Vanuatu (Image courtesy of C. V. Starr Virtual Herbarium); right: living specimen of the same species. (Photo by Gregory M. Plunkett).



Figure 9. Reuben Neriam, of Aneityum Island, placing a stick of *Hibiscus tiliaceus* L. on a doorstep as a message. (Photo by Michael J. Balick).



Figure 10. The species *Polyscias samoensis* (A.Gray) Harms, called *nauraua* in the Anejoñ language, is stuck in the ground or in rocks at intervals along the coast, conveying that the whole length of reef it covers is blocked from any marine harvest. (Photo by Neal Kelso).

Appendix 2

Table 1. Message plants of southern Vanuatu

Language	Local name	Latin name	Collection number ²	Use	Local experts
Anejom̃	intoṽ hau, inhauamai, inhau (green leaf), inhau caṽ (red leaf)	<i>Hibiscus tiliaceus</i>	GMP-3202	This species is an important message plant. If someone is not home and someone else comes to visit from the eastern part of the Island (from Anawonjei district) the second person can leave a 12-inch stick in front of the door so that the inhabitant knows that an eastern visitor has come by. The reason that person has come to visit is to pass on an important message – good or bad ‘luck’. The bad luck message might be a death and cannot be conveyed directly. The recipient of the message will ask ‘Who?’ after seeing the message plant and can then be told the name of the deceased. The good luck message might be a birth or that a conflict has been resolved. These messages are communicated using sticks – each district has a different species of plant. Reuben Neriam’s is the <i>Hibiscus tiliaceus</i> , as he is from Anelcauhat. (See Figure 9).	Wina Nasauman, Tony Keith, Marie Michelle
Anejom̃	intoṽ asiej, intopasiej	<i>Wollastonia biflora</i>	GMP-3221, GMP-3446	If a person wishes to break an agreement, then the person puts the top leaves of this plant on another individual’s doorstep to indicate that the agreement is broken.	Reuben Neriam

Anejom̃	<i>nekei atimi,</i> <i>nekeatimi</i>	<i>Angiopteris</i> <i>evecta</i> (G. Forst.) Hoffm.	<i>AAM</i> 28, <i>GMP</i> -3654	To make a head decoration for welcoming visitors, one is to take two long pinnate leaves (second order pinnae) and tie the bases and tip as a lei for wearing around the neck. This is used to welcome visitors and for decoration. (See Figure 5).	Wina Nasauman, Tony Keith
Anejom̃	<i>nahojcei</i>	<i>Canavalia</i> <i>rosea</i>	<i>GMP</i> -3544, <i>GMP</i> -3224	If a person wants to build a house or garden in a specific place, he puts a piece of this vine on a stick near the area to tell others that they should not build a garden or house near this area – this is a message about a <i>tabu</i> . There are a few other unspecified leaves added to the stick, not only this one.	Titiya Lalep, Wina Nasauman
Anejom̃	<i>inwow-</i> <i>inyuwun,</i> <i>inwounetun</i>	<i>Cassylha</i> <i>filiformis</i>	<i>GMP</i> -3545	(1) If a person is walking through a village that is not his own, people know that he comes in peace if he wears this plant. (2) If a group is discussing something and one person goes out and makes a head lei of this vine, it means that there can't be any agreement. (3) If someone is angry at someone else, he drops the vine at their door, and the second person needs to leave.	Titiya Lalep
Anejom̃	<i>namrad</i>	<i>Croton insu-</i> <i>laris</i> Baill.	<i>GMP</i> -4752, <i>MJB</i> -4876	(1) When men, women, or children are walking on a path, they take the top of the leaves and put it in their hair or behind their ear, or in their basket, to make the journey shorter. (2) When people see a person with this leaf in their hair or behind their ear, they know that this person comes from the western side of the island.	Wopa Nasauman, Wina Nasauman, Tony Keith, Reuben Neriam, Marie Michelle, Natu Kenneth

Anejom̃	<i>nala</i>	<i>Dendrolobium umbellatum</i> (L.) Benth.	<i>GMP-3217, GMP-3533, GMP-3572, MJB-4860, MJB-4961</i>	<p>(1) When traveling past a community one can place these leaves in a basket or walk with it in his or her hand. In this way, people in the community know that this person is traveling in peace and will not harm the people in that village.</p> <p>(2) If a person travels from one district to another on Aneityum, and the tree can be seen planted in that other district, the traveler knows they are free to come into this area.</p> <p>(3) If a person goes to visit a relative, and they are not at their home, then he is to leave a branch of this tree on their doorstep or somewhere they can see it and then the person knows that some relatives have come and tried to visit them.</p>	<p>(1) Reuben Neriam, Keith Yaiyaho; (2) Reuben Neriam, Wopa Nasauman, Charlie Nafarniyng; (3) Wina Nasauman, Tony Keith, Marie Michelle</p>
Anejom̃	<i>inpa, inpaunatmas</i>	<i>Euodia hortensis</i>	<i>AAM-26, GMP-3525</i>	<p>The name of this plant means 'peace'. (1) During a peace ceremony, when someone places food in an offering, he gives a branch of this plant to the other party to symbolize that the conflict is over.</p> <p>(2) It conveys that a person comes in peace. The individual in question puts small tips of the leaves in one's hair, makes a hat out of it, or carries it in one's hand and people will know that this person comes in peace when walking to a village that is not one's own. When giving a gift, for example a basket, one will put this leaf on the gift. When displayed on a basket or wearing the leaves, people are happy and peaceful. This is symbolic of Aneityumese people, so even when people leave their island, they grow this plant.</p>	<p>(1) Titiya Lalep; (2) Titiya Lalep, Wina Nasauman, Tony Keith, Reuben Neriam, Marie Michelle</p>

Anejom̃	<i>nelmaha</i>	<i>Ficus septica</i> Burm. f.	<i>AAM 6,</i> <i>AAM 21</i>	<i>Nelmaha</i> means 'Go away!' in the Anejom̃ language. If a person puts this stem or leaf in someone else's garden whom they are angry with, it conveys the message 'Go away!'	Wina Nasauman, Tony Keith, Reuben Neriam, Marie Michelle
Anejom̃	<i>nikam</i>	<i>Finschia chloroxantha</i> Diels	<i>GMP-3481,</i> <i>GMP-4076</i>	(1) If a person goes to another village with a leaf of this species in their hand, then people know that someone else is coming. (2) When a branch of this plant is left at the house of a person, it indicates that someone had visited them and they were not home. They can then ask neighbors as to who it was that called.	Titiya Lalep, Wina Nasauman, Tony Keith, Reuben Neriam, Wopa Nasauman, Thomas Japanesai
Anejom̃	<i>iñpāl apogen, inpal-caponecin</i>	<i>Hibiscus coo-peri</i> Meehan	<i>AAM-31,</i> <i>GMP-4751</i>	Used as personal protective adornment by people from the western side of Aneityum island, but not people from the eastern side. It is forbidden to be used by people on the eastern side because it is believed that, if used as a personal adornment for these people, the spirits of the eastern side will not be happy and can harm or even kill the offending people.	Wopa Nasauman, Wina Nasauman, Tony Keith, Reuben Neriam, Marie Michelle
Anejom̃	nautahos	<i>Isachne comata</i>	<i>GMP-3280</i>	If one goes to a person who composes songs and give this to them, they will know they are to compose a song. The name means 'flowers on the ground'.	Wopa Nasauman, Titiya Lalep, Thomas Japanesai

Anejom̃	<i>nawa</i>	<i>Polyscias guilfoylei</i>	<i>AAM-7</i>	Used to convey a message when it is time to protect a reef – to conserve it and attract more fish. Cut the stem of the whole plant and put it in the reef in several places – people will know that this area is under protection and respect it by not fishing or gathering there. This conservation practice of temporary reef closure is sometimes referred to as ‘saltwater blocking’ or ‘reef tabu’ (Hickey, 2006).	Wina Nasauman, Tony Keith, Marie Michelle
Anejom̃	<i>niég³</i>	<i>Saccharum maximum</i> (Brongn.) Trin.	<i>AAM-12</i>	(1) One takes a cane, ties the leaves together, and then ties this to a tree to indicate that it is <i>tabu</i> . For example, it is attached to a citrus tree that will ripen soon, and people will know that they cannot pick the fruit. (2) This message plant means ‘Don’t stop!’ and refers to the transport of kava. One is to tie the leaves into a knot and put the stem on a kava stem that has been harvested. This means ‘this kava goes express’ so the carrier of the kava goes to the border of a village and passes it on to another person who knows that it cannot stop in their village. Rather, it must be carried to the next village and passed along in this way until it gets to its destination.	Wina Nasauman, Tony Keith, Marie Michelle
Anejom̃	<i>nirid u numu, niridunumu</i>	<i>Schizaea dichotoma</i>	<i>GMP-3482, GMP-3614, GMP-3284, GMP-4121</i>	The local name means ‘fish gill’. It is put in a person’s hat when they come back from fishing, letting people know that they caught fish.	Titiya Lalep, Wina Nasauman, Tony Keith, Ruben Neriam

Anejom̃	<i>naerumuan</i> , <i>naeruman</i>	<i>Schleinitzia</i> <i>insularum</i> (Guill.) Burkart	<i>GMP-3576</i>	Unspecified use as a message plant.	Titiya Lalep
Anejom̃	<i>necemas</i>	(a) <i>Selaginella</i> <i>distans</i> Warb., (b) <i>S. durvillei</i> A. Br.	(a) <i>MLB-4919</i> ; <i>GMP-3509</i>	Signifies that there has been a death. The person holds one dried leaf or puts it on their head, goes to someone else's house and hands it to the person they wish to convey the message to without saying anything. It can also be handed to that person. The person receiving the message then asks 'Who?' and is told the deceased person's name.	Natu Kenneth, Wopa Nasauman, Thomas Japanesai, Dick Matenekea
Anejom̃	<i>nemdanlap</i> , <i>nemtanla</i>	<i>Sida cordifolia</i> L.	<i>MLB-4892</i>	If a person is coming to a 'new' village, e.g., not their own village, and holding a branch in his or her hand, it means that he or she is coming in peace and not trying to harm anyone in the new village. Or, if this person is asking for something that might be found in the new village, he or she holds the branch of this plant and passes it to someone from that village to gain acceptance.	Wopa Nasauman, Rene Theimu
Anejom̃	<i>intaleja</i> , <i>inteleja</i>	(a) <i>Spathoglottis</i> <i>pacifica</i> Rchb. f. (b) <i>S. petri</i> Rchb. f.	(a) <i>GMP-3523</i> ; (b) <i>GMP-3480</i>	If a person puts this terrestrial orchid flower behind his or her ear and then stares at someone else or tosses the flower at that person, it is an invitation to follow the first person, to drink kava, for example, or go swimming. Or a man invites a woman to go somewhere with him. Alternatively, the flower can be left on a table, and this is also a message to go with that person.	Titiya Lalep

Anejom̃	n̄yeg	<i>Miscanthus floridulus</i>	<i>MJB-4885</i>	<p>(1) When a man wants to obtain kava stumps from another man (because he has none of his own), he places a stem of wild cane in front of the door of the other man's house. On the top of the cane, he fixes a leaf that represents his tribe, orienting it in the direction in which he will walk away and then leaves. When the other man emerges from his house, he sees the message and goes to look for the first man. No payment is given at this time, but when the kava owner needs to have a <i>kastom</i> ceremony, he knows he can count on the borrower to supply him with mats, pigs, etc., in return for the kava.</p> <p>(2) Used to mark a route. If two people have planned to walk together but depart at different times, the person who departs earlier may place these plants along the side of the road to indicate to the second person which direction s/he is walking in.</p> <p>(3) To indicate that something is <i>tabu</i> (sacred, forbidden), one ties the leaf and puts it on an object, such as ripe bananas. People will understand it is <i>tabu</i> and will not take it away.</p>	Bernard Daniel, Raymond Seimea, Wopa Nasauman, Rene Theimu
Futuna	wowofune	<i>Alyxia stellata</i> (J.R. Forst. and G. Forst.) Roem. and Schult.	<i>MJB-5244</i>	<p>Ancient people were said to use this vine to decorate their heads during the <i>kastom</i> dance. If people decorate their heads with this vine today, they say that the vine is from the God of Majikjiki, Futuna, and if one wears it, people will know that the person is from Futuna – a sign of identity.</p>	Naumeta Rose, Paul Fatapa

Nafe	<i>neure</i>	<i>Alocasia cucullata</i>	<i>MJB-5200</i>	Ornamental, planted to indicate boundaries of a person's property, garden, or house.	Johnson Noar, Peter Nisian
Nafe	<i>nare, nare sarhet (H. coronarium)</i>	(a) <i>Alpinia novae-pomeraniae</i> , (b) <i>Hedychium coronarium</i>	(a) <i>MJB-4724</i> ; (b) <i>MJB-4722</i>	Used to welcome visitors by weaving the leaves and flowers into a head lei, locally known as a <i>kuanari</i> . If there are no flowers, people weave the leaves to welcome visitors. The visitor will wear this ornament for at least several hours, indicating their honored guest status. This species is becoming invasive in the area. (See Figure 5).	Sam Natou, Jean-Pascal Wahe
Nafe	<i>nakaimuap, nakaimap, nekemuap, nekemap</i>	<i>Piper latifolium</i>	<i>MJB-5170</i>	The leaves of this plant are placed on a fruiting tree to indicate that it is tabu and not to be touched. Alternatively, the leaves are put near the tree to let people know to keep away from the tree.	Johnson Noar, Peter Nisian
Nafe	<i>kor-wisihëru, kwarwisiwir</i>	<i>Dendrobium mollianum</i>	<i>GMP-4614</i>	If a man adorns himself with a stem of this orchid with a flower in it, it signifies that he has been in the high elevation forest.	Natao Numruken, Taya Ninneth, Naiwan Sam, Johnny Karpa, Tan Danifer, Kayas Narko
Nafe	<i>nisei, nisei, nisei arman, nisei anatam</i>	<i>Euodia hortensis</i>	<i>MJB-4728</i>	(1) Men use these leaves to decorate an arm band. These leaves are also used to tie a kava root for a ceremony in the <i>nakamal</i> . For a <i>kastom</i> ceremony, one is to take coconut endosperm, chew it this leaf and cover one's body. It makes the body smell very nice. (2) For <i>kastom</i> ceremonies, use this plant to decorate the roots of kava that is given to a chief; also used in women's grass skirts for <i>kastom</i> dance.	(1) Teresa Wahe, Samuel Kehma, Jean Paolo Niawarau, Philip Wahe; (2) Natao Numruken, Naiwan Sam, Tan Danifer, Kayas Narko, Taya Ninneth, Johnny Karpa

Nafe	<i>kaiao kaiuao</i>	(a) <i>Prosaptia contigua</i> (G. Forst.) C. Presl, (b) <i>Nephrolepis cordifolia</i> (L.) C. Presl	(a) <i>GMP-4689</i> ; (b) <i>GMP-4608</i>	People use this fern to adorn their hair during <i>kastom</i> ceremonies and dances. It was used more widely before people had chicken feathers. Men and women who live in <i>kastom</i> villages still use this in their hair.	Natao Numruken, Taya Ninneth, Naiwan Sam, Johnny Karpa, Tan Danifer, Kayas Narko
Nafe	<i>naturauna, naturena</i>	<i>Phlegmariurus phlegmaria</i> (L.) Holub	<i>GMP-4603</i>	The vine is dried in the sun and wrapped around a person's head and on their arms as an adornment during <i>kastom</i> ceremonies.	Natao Numruken, Taya Ninneth, Naiwan Sam, Johnny Karpa, Tan Danifer, Kayas Narko, Rawi Amos
Naka	<i>napias</i>	<i>Fagraea berteriana</i> A. Gray ex Benth.	<i>MJB-4744, MJB-4848</i>	Flowers are strung on a string to make a necklace used to welcome visitors. By wearing this adornment, the visitor signals his or her status as a guest who has been properly welcomed.	Kating Ken Matai, Marie Ken Matai, Ken Bob Matai, Naloma Ken Matai
Neuai	<i>naewan naewan</i>	<i>Melicactus fasciger</i> Gillespie	<i>GMP-2878</i>	Symbol for the people from the villages from Enmira to Iuihaker, along the east coast of Tanna Island.	David Kapwia, Joseph Dabuah, Tupun Alexis
Netwar	<i>narwii</i>	<i>Cordyline fruticosa</i>	<i>MJB-4819</i>	(1) Cultivars with green leaves are planted on graves to mark them. Because the plant grows for a very long time, it is a symbol of eternal life. (2) Often planted to mark the boundaries of one's land. The shrub may be planted near a stone marker that reflects the origin of a person's tribe. It is always to be left where it has been planted. (See Figure 8).	Lui Noamel, Joe Natuma, David Tao, Jack Iawaiah, Natua Harry

Netwar	<i>nuig</i> ⁴	<i>Miscanthus floridulus</i>	<i>GMP-3104, MJB-5088</i>	<p>(1) If someone does not bring their own kava to the <i>nakamal</i>, they can bring a short stem of <i>nuig</i> with a few leaves on it to make others aware they need to prepare their kava.</p> <p>(2) After a newborn's umbilical cord falls off, a trail of <i>nuig</i> leaves tied into a knot with a loop is made to lead people to the umbilical cord burying ceremony.</p>	<p>(1) Clément Kapalu, Iahwot, Joe Nasak, Joe Natuman, Mois Nako, Nadine Ramik, Pierrot Nako Yeru, Sam Posen, Tao Metiwai, (2) Katmatem, Sam Iahipe</p>
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Planting seeds for the future: Challenges and solutions for Cham traditional medicine in the context of Vietnam's rapid modernization

Tuyen Dai Quang^a, Quyen Thanh Dao^b, and Hoang Van Nguyen^c

Abstract

The present study is an investigation of the indigenous Cham community of Vietnam, descendants of an ancient civilization, and their efforts to preserve traditional forms of knowledge related to plant diversity and its applications for health and personal wellness. The study was conducted over two years through ethnographic fieldwork in two Cham villages and employs a mixed-methods approach, combining observation, interviews, and linguistic analysis. The findings reveal the challenges faced by the Cham people in preserving medicinal plant varieties and indigenous knowledge amid Vietnam's rapid modernization and economic reforms. The linguistic practices surrounding the cultivation of medicinal plants and the movement of local vendors between rural and urban environments for the sale of traditional medicine are analyzed. The findings emphasize the importance of the Cham language in safeguarding both cultural practices and livelihoods, contributing to the broader discourse on indigenous knowledge and conservation. This work serves as a foundation for further exploration into how the Cham's medicinal practices could inspire community-based tourism, offering new perspectives on addressing contemporary challenges and fostering sustainable development.

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1 Introduction

For many centuries, the use of plants for medicinal purposes has been prevalent among various cultures globally (Sheng-Ji, 2001; Khánh, 2002; Nimachow, Joshi, and Dai, 2011; Kumar, Kumar, Komal, Ramchiary, and Singh, 2021). There are up to 50,000 plant species used in both traditional and modern medicine systems worldwide (Leaman, 2006). The experience and knowledge of medicinal plants, as well as their usage and combination to treat various ailments, hold significant cultural value for communities (Timilsina and Singh, 2015; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019). This reflects human interaction with the natural environment and their approach to it (Brown, Mitchell, and Beresford, 2005; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019; Kumar, Kumar, Komal, Ramchiary, and Singh, 2021). Therefore, documenting traditional medicinal plants plays a crucial role in future scientific research (Shrestha and Shrestha, 1999).

The preservation of Indigenous Knowledge (IK) systems, particularly those related to medicinal plants, is crucial for the sustainability of indigenous cultures and is increasingly recognized as invaluable by scientists and planners working to ameliorate conditions in remote communities (Sheng-Ji, 2001). This knowledge, borne out of a profound connection with the environment, offers unique insights into plant resources that have been finely tuned over generations (Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019; Kumar, Kumar, Komal, Ramchiary, and Singh, 2021). But the transmission of this wisdom, predominantly through oral traditions, is imperiled by the forces of global urbanization that catalyze the erosion of IK and the practices of traditional medicine (Kozuharova, 2013; Aswani, Lemahieu, and Sauer, 2018). The modernization process, characterized by increased literacy, migration, and urbanization, dilutes the depth and breadth of natural resource knowledge, challenging the ability of communities to identify, use, and manage these vital plant resources (Saynes-Vásquez, Caballero, Meave, and Chiang, 2013).

Urbanization is a complex economic process that brings about rapid social and environmental changes, sometimes leading to cultural innovations and the shift in behavior and social organization (Naylor, 1996; Pickett, Cadenasso, Childers, McDonnell, and Zhou, 2016; Arjona-García, Blancas, Beltrán-Rodríguez, López Binnqüist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021).

At the same time, urbanization drastically alters people's lifestyles, perceptions, and sociability, directly affecting the use and management of natural resources (Nilon, Berkowitz, and Hollweg, 2003).

Numerous studies have emphasized the pressing need to record and implement indigenous knowledge about medicinal plants to prevent the loss of such knowledge. This knowledge, which has been passed down for generations through oral tradition, is threatened by the decline of medicinal plant species (Karunamoorthi, Jegajeevanram, Vijayalakshmi, and Mengistie, 2013; Dutt, Bhagat, and Pandita, 2015; Cámara-Leret and Bascompte, 2021; Ogwu and Osawaru, 2022). The significance of indigenous knowledge in conserving medicinal plants has been widely acknowledged (Msuya and Kideghesho, 2009; Nimachow, Joshi, and Dai, 2011; Kumar, Kumar, Komal, Ramchiary, and Singh, 2021). Studies indicate that the decline of medicinal plants globally puts many plant varieties at risk of extinction, with an estimated 15,000 species being threatened each year (Roberson, 2008; Chen, Yu, Luo, Wu, Li, and Steinmet, 2016). As such, indigenous communities, with their wealth of experience and oral traditions, play a crucial role in conserving medicinal plant varieties in a sustainable manner (Dutt, Bhagat, and Pandita, 2015; Chen, Yu, Luo, Wu, Li, and Steinmet, 2016; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019; Ogwu and Osawaru, 2022). Heywood (2017) emphasizes the importance of community participation for conservation, linking it to the achievement of social, environmental, political, and economic goals. Furthermore, Augustino and Gillah (2005) emphasize the crucial role of indigenous knowledge and traditional management institutions in successful conservation, specifically highlighting communities' understanding of medicinal plants. For effective conservation of medicinal plants, authorities should engage the community and document and integrate indigenous knowledge on land use, biodiversity, home gardens, and vegetation and forest management. The ethnobotanical approach facilitates community participation and reduces potential negative impacts on the local community and environment (Sheng-Ji, 2001; Dutt, Bhagat, and Pandita, 2015; Abdela and Sultan, 2018).

While studies have examined the importance of medicinal plants for treating illnesses and the contribution of the medicinal plant industry to the economy at a macrolevel (Phillips and Meilleur, 1998; Maunder, Higgins, and Culham, 2001; Palabaş Uzun, and Koca, 2020; Arjona-García, Blancas, Beltrán-Rodríguez, López Binnquist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021), little research has been conducted at the microlevel, specifically among village communities practicing traditional medicinal plants. Despite this, medicinal plants and traditional medical practices play a

significant role in the local household economy (Hamayun, Khan, Sohn, and Lee, 2006). For example, the Cham people in Vietnam and their livelihood serve as a prime illustration of this.

This study pivots towards Vietnam, a nation celebrated for its botanical diversity, hosting 10,386 plant species with over 30% of its medicinal flora thriving in the mountainous expanses that dominate the country's geography (Khánh, 2002). Among Vietnam's 54 ethnic groups, the Cham community stands out for its enduring practice of using plant parts for medicinal purposes – a tradition passed down through generations and considered a familial treasure. In Xuan Hai Commune, where four Cham villages are situated, traditional medicine remains a cornerstone of daily life and economic survival, despite the alarming decline in practitioners observed in recent years (Quyến, 2009).

The gradual disappearance of the traditional medicine profession among the Cham, with only 40% of families continuing the practice as of 2007, signals a critical juncture. This decline not only threatens the preservation of the Cham people's IK about medicinal plants but also challenges the sustainability of their livelihoods (Quyến, 2009). Compounded by societal prejudices, the Cham's dedication to their traditional medical practices faces numerous obstacles yet also presents opportunities for medical and economic revitalization.

In light of these challenges, this study examines the perspectives of the Cham community regarding the conservation of medicinal plant varieties and their importance for the community's livelihoods (Hamilton, 2004; Arjona-García, Blancas, Beltrán-Rodríguez, López Binnquist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021). It also addresses the societal prejudices they encounter. The research aims to contribute to the discourse on conservation and sustainable development by providing insights and recommendations that can guide policies and programs. The study focuses on preserving the cultural heritage of the Cham people and ensuring the sustainability of their medicinal plant practices. By doing so, it sheds light on the challenges faced by the Cham community and the potential for mitigating the loss of traditional language and knowledge in the evolving socioeconomic context of Vietnam.

2 Locating research context

Ninh Thuan, located on Vietnam's South Central Coast, features a varied terrain of mountains, hills, and coastal plains (see Figure 1). Its distinct dry climate, resulting in lower than average annual rainfall, contributes to its unique environment. Home to approximately 590,467 people, the province boasts a significant Cham community, representing 13% of the population, primarily concentrated

in 22 villages with a strong heritage in herbal medicine. A survey revealed the use of 324 plant species by the Cham for medicinal purposes, underscoring Ninh Thuan’s conducive setting for sustaining traditional medicinal practices and plant conservation within the Cham community.

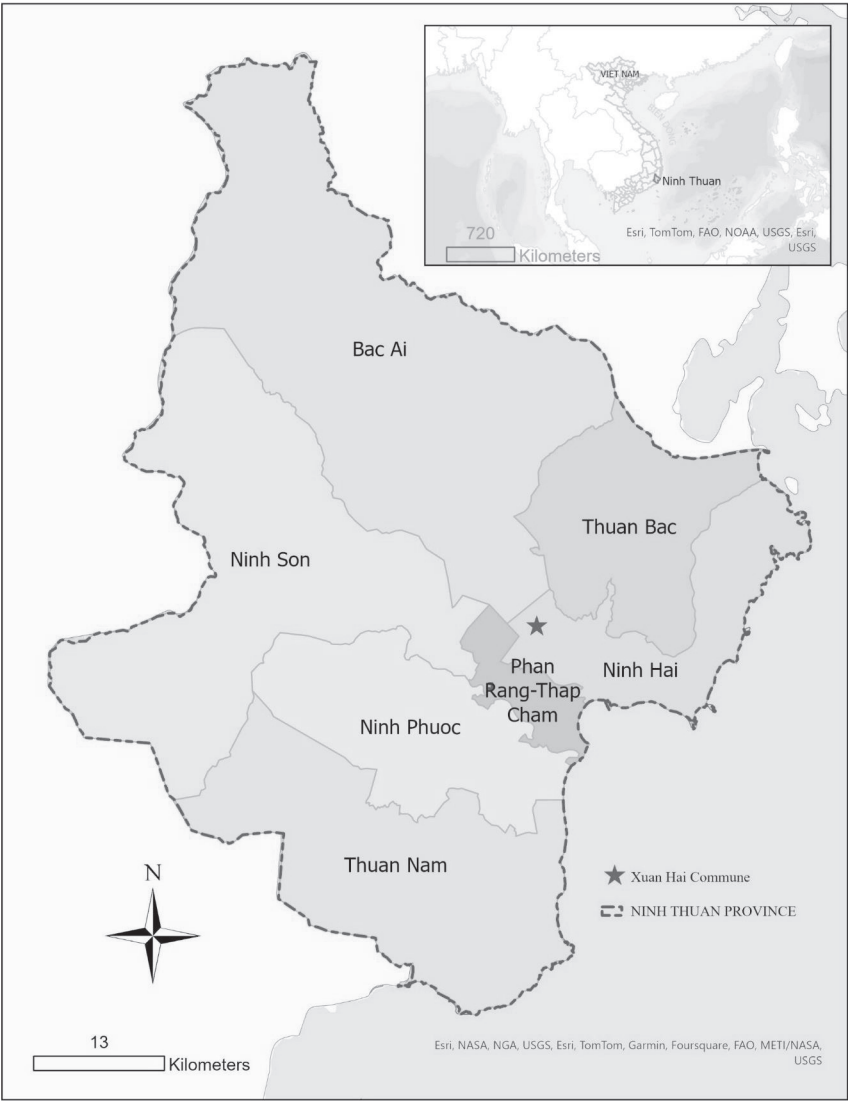


Figure 1. Map of Ninh Thuan province.

The Cham people’s traditional medicine, rooted in centuries of experience and knowledge, is a testament to their deep connection with nature. This practice, integral to their culture, has been meticulously passed down through generations, teaching them the dual use of plants for nutrition and medicinal purposes to enhance health and treat illnesses. Their medicinal practices have evolved through interactions with other ethnic groups, including the Kinh majority and the Raglai minority, among others, enriching their healing traditions. The Cham community’s folklore, embodying their ethical principles, often depicts the repercussions of one’s actions, promoting moral conduct and a harmonious coexistence with the environment, as illustrated in tales like the ‘three-legged tiger’ or the ‘legend of Po Tang’. Utilizing approximately 700 herbal remedies derived from over 300 plant species across 97 families, the Cham have a significant repertoire of medicinal knowledge, with plants mainly gathered from midland and mountainous regions (see Figure 2). Their commitment to conserving natural resources and ecosystems highlights a distinctive respect for biodiversity, setting them apart in terms of medicinal plant diversity among Vietnam’s ethnic minorities (Oriental Traditional Medicine Association, 2013; Anh, Hà and Vinh, 2015).

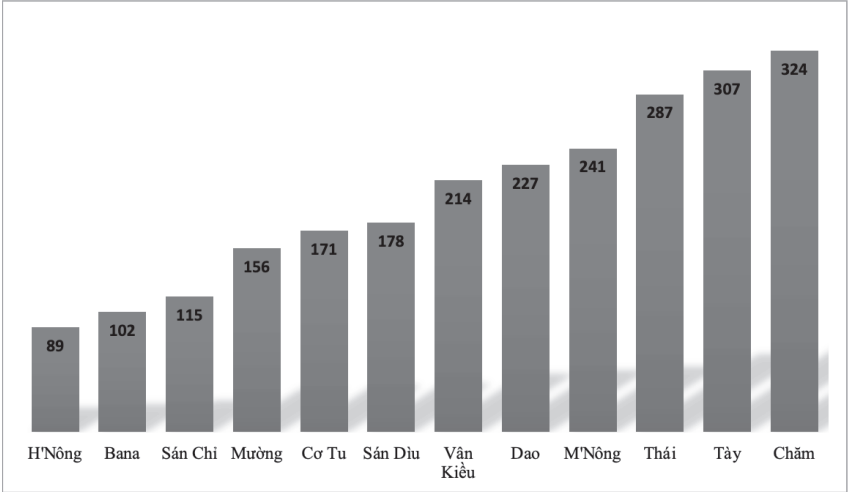


Figure 2. Comparison of medicinal plant sources among the Cham ethnic group and other ethnic groups in Vietnam (Anh, Hà, and Vinh, 2015).

In the past, the Cham community sourced their medicinal plants from the abundant resources in the mountainous areas of Ninh Hai and Bac Ai district in Ninh Thuan province. However, they now have to venture to other provinces in search of these herbs. The Cham people have a long history of using herbal medicine to treat various illnesses (see Figure 3).

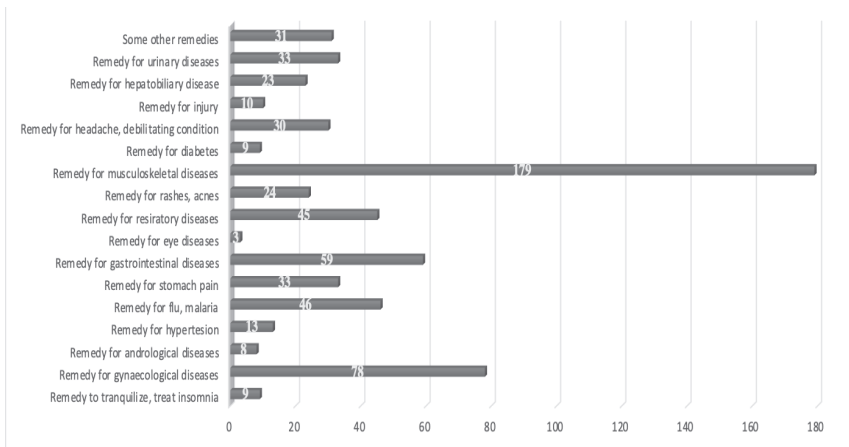


Figure 3. The Cham traditional medicinal remedies are used to treat diseases (Courtesy of the authors in 2022).

The composition of their medicinal plant arsenal is extensive, with 325 species from 79 plant families being utilized for health and disease prevention. These plants are temporarily categorized into ten disease groups and classified into two forms: color and taste. The Cham people can use these medicinal plants in various ways, such as using the whole plant or individual parts of the roots, stems, and leaves. Over half of their use of medicinal plants is through decoction, followed by drinking alcohol and external use (such as pounding and applying to wounds). Figure 4 illustrates the ingredients used by the Cham people.

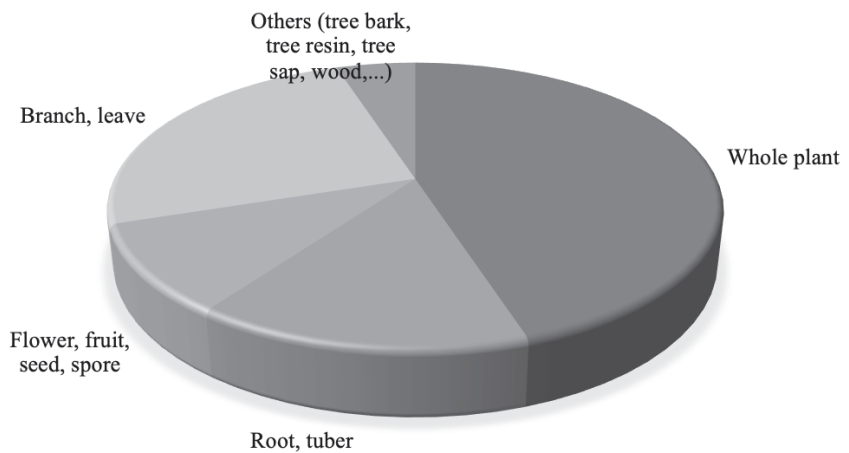


Figure 4. Parts of medicinal plants are used in the Cham traditional medicine. (Courtesy of the authors in 2022).

Additionally, the Cham people also use stem juice and fragments for treatment purposes. Through the analysis of their vast traditional knowledge about the use of medicinal plants for health and disease prevention, a list of diseases treated with medicinal plants was compiled.

3 Research methods

This qualitative study used various methods to collect and analyze data, including ethnographic fieldwork, on-site observation, semi-structured interviews, and informal conversations. Dwyer, Gill, and Seetaram (2012) suggest that ethnographic fieldwork and on-site observations are best suited for describing the culture and beliefs of ethnic minority groups. The first two authors, Cham community members, conducted on-site observations to understand the study area, build social connections, and select interviewees. The semi-structured interviews and informal conversations allowed researchers to delve deeper into the research problem and allowed interviewees to share their views more openly (Magaldi and Berler, 2020). The interview topics are divided into five parts (see Table 1).

Table 1. Interview topic.

Part 1	Demographic information
Part 2	Learn, identify characteristics of medicinal plants with community participation
Part 3	Efforts at preserving medicinal plants and transmitting the medicinal profession to younger generations
Part 4	Barriers and challenges in preserving traditional medicine and medicinal plants in the process of modernization
Part 5	Social stereotypes/discourses about traditional medicine, about people, and Cham herbal vendors

The study interviewed various respondents, including local authorities and Cham community members, with a focus on traditional healers, medical practitioners, and indigenous herbal vendors (see Table 2). Indigenous herbal vendors are often shunned by society, and semi-structured interviews and informal conversations allowed the researchers to collect rich information from them. The study collected data for two years and conducted 65 semi-structured interviews and informal conversations until the data was saturated (Guest, Bunce, and Johnson, 2006).

Table 2. Profile of interviewees.

Group of interviews	Code	Number	Gender		Average age (year)	Average year of experience
			Male	Female		
Local authority	Gov	5	4	1	45.2	10
Doctor of Oriental Medicine Association	Doc	5	3	2	50.1	22.5
Physicians, traditional healers, and herbalists	Orang	50	28	22	52.2	18.2

The collected data was analyzed to identify themes, including community efforts to conserve indigenous medicinal plants, challenges of the disappearance of medicinal plants and folk wisdom, and social prejudices about medicinal plants vendors. To protect respondent privacy, codes were used in presenting and discussing the results.

4 Findings

The findings are presented in three parts: the community’s efforts to conserve indigenous medicinal plants, challenges of the disappearance of medicinal plants, language used and folk wisdom, and social prejudices about the Cham plant vendors.

4.1 Community’s endeavors to preserve endemic medicinal plants

4.1.1 Intergenerational transmission of traditional knowledge on medicinal plants within the community

The Cham community has a long history of passing down indigenous knowledge about medicinal plants. The exploitation of spices and medicinal plants, referred to as *Jru* in the Cham language and *Thuốc Nam* in Vietnamese, was practiced within the Po Gihlau (Lord of Agarwood) family for exchange and trade purposes. The practice was maintained by families until the early 20th century and then expanded to neighboring provinces as the sale of herbal medicine for health care continued until 1995. After 2000, the profession of selling herbal medicine formed a professional force such as traditional medicine agents, specialized exploitation forces, and doctor’s forces. Each family or clan has its own unique remedy, which is only passed down within the matriarchal family and clan. Mothers or grandmothers choose and train a child in the profession when they reach the age of 13 to 15. Women have priority

in receiving vocational training, and if a man receives such training, he cannot pass it on to his children when he gets married. The children initially follow their mother, grandmother, or uncle to the fields, nearby forests, and mountainous areas to learn to identify medicinal plants and the features of each medicinal and poisonous plant. They also learn sustainable exploitation skills to avoid over-exploitation. Children who show a gift in the medicinal profession will be chosen to continue the tradition and pass it on to their own families and clans (see Figure 5).



Figure 5. Communicating folk knowledge about medicinal plants in the family.
(Courtesy of the authors in 2017).

The Cham people have a long history of using medicinal plants for their health and well-being, passed down from generation to generation within families and clans. This indigenous knowledge, known as *Thuốc Nam* has been developed into a profession that is now widely used across the country and neighboring countries. The transmission of this knowledge is carefully guarded and strictly regulated to ensure its long-term sustainability (see Table 3). Before going to the forest to collect medicinal plants, the Cham men perform a ritual to seek permission from the gods and their ancestors. The process of harvesting medicinal plants must be done in accordance with strict rules, as the Cham believe that violating these rules can result in disease or natural disasters.

Table 3. The harvesting regulations of the Cham people.

Ingredients of medicinal plants	Harvesting regulations
for plants used to make medicine from branches	pruning branches or exploiting a part of the main branch
for plants used to make medicine from roots	only parts of its roots are harvested, with the rest left for regeneration and future growth
for plants used to make medicine from fruit and leaves	harvested seasonally
for plants used to make medicine from tubers	1/3 of the tubers are harvested, and the rest is left for regrowth
for plants where all parts can be used for medicinal purposes	some of the roots or tubers is also left for future regrowth
the seedlings and immature plants in particular	never harvest

This passage describes the tradition of passing down the profession of *Thuốc Nam* (medicinal plants harvesting) within families and clans in Cham villages. The reason for this is due to a combination of wanting to keep the practice secret for their own livelihood as well as a belief in the worship of a god of *Thuốc Nam*. The Cham people believe that the god has given them knowledge and experience to use the medicinal plants to save people from diseases, and they are afraid that any carelessness in teaching or the lack of effort and morality of the learners will result in punishment from the gods of the forest, rivers, mountains, and the gods of *Thuốc Nam*. Therefore, the tradition of passing down the profession mainly within the family is seen as a way to ensure that the knowledge is passed down safely to the next generation. Many elderly people in Cham villages are dedicated to passing down the knowledge and assisting in preparing medicines for patients, and they view this as a blessing of the *Thuốc Nam* professionals.

4.1.2 Exchanging, networking, and enhancing professional expertise

In recent years, there has been an effort to improve the knowledge of herbalists in the Cham community. The Oriental Traditional Medicine Association (OTMA) of Xuân Hải Commune (in Vietnamese, Hội Đông Y xã Xuân Hải) was established in 2000 to effectively exploit and conserve precious medicinal species and assist people. The local government is also promoting awareness about the value of medicinal plants and medical knowledge among the people. The OTMA of Xuân Hải Commune is a place for practitioners of oriental medicine

to train and standardize their knowledge and skills. It provides access to new knowledge in the field of oriental medicine through experts and experienced doctors. Participants who complete the course will receive a certificate of traditional medicine practice. This certificate is seen as a symbol of their dedication to the profession. The Cham community has nearly 500 members of traditional medicine, and 85% of them have completed training courses. Additionally, 13 people have been certified as national medicine practitioners. Through regular meetings and discussions, the doctors continue to improve their skills and update their knowledge.

4.1.3 Collaborative efforts to protect medicinal plant diversity and traditional knowledge

The Cham community has been working to preserve and promote their traditional knowledge about medicinal plants through various initiatives. In 2011, the OTMA of Ninh Thuan Province has also implemented a project to preserve medicinal plants, which has been successful with 30 households registered to grow medicinal plants and 24 households planting medicinal plants in a total area of nearly 1,000 square meters. The community also cooperates with other departments to conduct research, document, and compile a book of medicinal plants and remedies, and to build a medicinal garden to preserve medicinal plants. The Cham community values the preservation of their traditional knowledge and continues to pass down the regulations and taboos for the medicine picking and treatment profession.

The efforts made by the Cham community, local authorities, and NGOs have resulted in a positive impact on preserving and developing the traditional knowledge of medicinal plants in the Cham community. The OTMA of Ninh Thuan Province, for instance, has helped standardize the practices of traditional medicine and provided training courses for practitioners. The preservation of rare and precious medicinal plants has also been supported through various projects, such as the building of medicinal gardens and the survey of medicinal plants in the province. Furthermore, to ensure that the Cham traditional knowledge is not lost, the Oriental Traditional Medicine Association, Health Department, and other specialized agencies have been documenting the traditional knowledge of medicinal plants and remedies used by the Cham people. They have been conducting surveys, compiling books, and building scientific records of medicinal plants to add to the list of Cham remedies.

4.2 The challenges posed by the disappearance of medicinal plants and the decline of folk wisdom

At present, the preservation, upkeep, and advancement of the Cham people's herbal medicine practice are facing significant obstacles. The following are the main challenges identified in the study.

4.2.1 The shortage of vital medicinal supplies

The Cham community is not only known for their medical expertise in curing diseases but also for their reliance on the rich and diverse natural sources of medicinal plants found in abundance throughout the province and neighboring areas. For many years, they have relied on the collection of medicinal plants mainly from the wild. Despite an annual harvest of approximately 300 tons of dried medicinal plants (equivalent to 3,000 tons of fresh plants), the source of these vital supplies has been gradually declining due to overharvesting. As a result, the scarcity of medicinal resources has become a pressing issue, as the supply of medicinal plants is no longer sufficient to meet the needs of the community's medical profession. To address this shortage, the Cham people have had to resort to importing medicinal plants from neighboring provinces, highlighting the crucial role of these vital medicinal supplies in their lives.

4.2.2 Breaking traditional regulations and overharvesting of medicinal plants among the Cham community today

The Cham people in Ninh Thuan Province in Vietnam, depend heavily on the practice of medicine for their livelihood, relying on the rich and diverse natural sources of medicinal plants in the area and neighboring provinces. However, years of overharvesting and exploitation of these resources have led to a decline in their availability. Many valuable medicinal plants are now extinct or becoming increasingly scarce due to the expansion of harvesting practices and a high demand for medicinal plants. The establishment of purchasing agents for medicinal plants has made it easier for doctors to acquire them, but it has also led to the formation of exploitation groups that indiscriminately exploit medicinal plants for commercial purposes. The Cham community is facing the risk of losing their traditional medical practice because medicinal plants in the wild are becoming exhausted. Community members continue to harvest medicinal plants, despite knowing that this is unsustainable, because they have no other means of supporting their families.

According to the OTMA of Ninh Thuan Province, the Cham community in the province relies on traditional occupations, such as harvesting and selling medicinal plants, to make a living. However, the current rampant exploitation

of these plants is leading to their exhaustion and putting the Cham medicine profession at risk. The OTMA of Ninh Thuan Province reports up to 300 species of plants used by the Cham people as medicine, with 13 dealers purchasing 1 ton of dried medicinal plants each day. The overexploitation of these medicinal plants, both by the Cham and Kinh people, is causing depletion and putting rare plants at risk of extinction. To ensure a long-term source, it is recommended that seedlings be researched and cultivated as a source of medicinal plants and to train the Cham community on sustainable collection and picking practices.

4.2.3 Significant changes in the source region of traditional medicinal plants

The availability of traditional medicinal plants has been severely impacted by urbanization and environmental conservation efforts. New construction projects, such as wind and solar energy, and residential developments have resulted in the shrinkage and loss of medicinal plant habitats. The Cham people now face a shortage of supply due to the ban on harvesting after the park's recognition as a World Biosphere Reserve. Additionally, adverse weather conditions and a lack of care for medicinal gardens by busy family members also contribute to the declining availability of medicinal plants. Additionally, the restriction of access to the largest medicinal plant area, Nui Chua National Park, has made it even more challenging for the Cham people to find the necessary medicinal plants. As the park has been recognized as a World Biosphere Reserve, the harvesting of plant resources has been banned, limiting the long-standing source of medicinal herbs for the Cham people. This has resulted in a shortage of medicinal plants and added to the difficulty in meeting the demand for healing.

While efforts have been made to establish medicinal plant projects, many of these projects have faced significant challenges, ultimately leading to their failure (Wilshusen, Brechin, Fortwangler, and West, 2002; Peterson, 2007; Selemani, 2020). These setbacks often arise from inadequate planning, insufficient training, and a lack of community awareness. The Cham members have expressed concerns about the effectiveness and sustainability of certain conservation programs. They specifically highlight issues such as the introduction of unsuitable plant species and a failure to consider their long-term conservation and sustainable development needs. Additionally, numerous projects have encountered obstacles due to a misalignment with the community's specific requirements, particularly in the context of conservation efforts. Medicinal herb gardens within Cham villages, which feature plant varieties like mallow, serrated dogwood, cypress trees, dragon blood trees, the bauhinia flower, and the cat's whiskers plant are essential for preserving traditional knowledge. Our

research indicates that the allocation of resources does not meet the community's needs, which reduces their level of involvement. Furthermore, challenges such as droughts, floods, and the lack of caretakers further exacerbate the struggle to preserve a variety of medicinal plants. The decline in the medicinal profession among the Cham people, with over 50% leaving for alternative livelihoods, puts their traditional medicinal knowledge at risk. This underscores the urgent need for action to preserve both their medicinal plant resources and ancestral practices.

4.2.4 The threat of indigenous knowledge loss and the challenge of passing down skills in the community

The Cham language plays a crucial role in preserving ethnobotanical knowledge since it encompasses terms and expressions related to medicinal plants that are not found in other languages. However, this knowledge is at risk of being lost due to the lack of interest among the younger generation in the profession, as well as the declining number of people fluent in the Cham language. If the Cham language were to disappear, a wealth of knowledge about medicinal plants and the traditional practices of the Cham people would be lost. Therefore, it is essential to preserve the Cham language to safeguard this valuable ethnobotanical knowledge and to ensure the continuity of the Cham people's medical practice.

This situation is reminiscent of the findings of Cámara-Leret and Bascompte (2021), who emphasize the intrinsic connection between indigenous languages and the unique understanding of local flora for medicinal purposes. Their research highlights the concept that most medicinal knowledge is linguistically distinct, existing only within the confines of a single language, and is closely tied to languages that are at risk of extinction rather than the plant species themselves. Thus, each indigenous language serves as a singular repository of medicinal wisdom, akin to a Rosetta stone, holding the key to deciphering and safeguarding nature's invaluable contributions to humanity.

The loss of language and cultural knowledge pertaining to medicinal plants and their usage among the Cham people is not merely a concern for their medical profession but also for their cultural identity. The Cham language contains vital information about traditional medical knowledge and the cultural significance of medicinal plants. This information cannot be easily translated or transferred to other languages and can only be fully comprehended and appreciated within the context of Cham culture and language. The Cham language is indispensable for preserving ethnobotanical knowledge as it encompasses specific words and phrases that describe the properties and uses of medicinal plants in Cham

culture. The loss of the language would result in a depletion of crucial cultural knowledge, making it more challenging for the Cham people to comprehend and preserve their traditional medical practices and the significance of medicinal plants in their culture.

The trend of young people not pursuing traditional professions is a common issue in many traditional craft villages, including the Cham community, where the medical profession faces the same challenge. The knowledge of remedies, considered to be family heirloom secrets, is passed down from grandparents and parents to their children. Each family has their own special remedies, and the *Thuốc Nam* profession is not shared with outsiders. With the aging population of those with knowledge about medicinal plants and the diseases they treat, the risk of losing this knowledge is becoming a reality. There has been limited focus on promoting and training the next generation, and, coupled with the complexity of the profession, this has led to a lack of interest among the younger generation in pursuing it. As a result, the tradition of *Thuốc Nam* is in danger of being lost. Prior to 1992, approximately 90% of families were engaged in this profession, but now only 40% of them continue to practice it. This disinterest in traditional professions is also reflected in the statements of some interviewees: 'I try to make a living, but I don't want my children to follow this career as it's too hard' (Orang002), and 'My children see me selling herbal medicine, but they choose better-paying jobs with good degrees' (Orang022).

4.2.5 The challenge of a lack of recognition for traditional medicinal practice

The lack of recognition and official branding for traditional medicine has posed a challenge for the Cham community in Xuan Hai Commune in Ninh Thuan. The traditional profession of making medicinal products is in danger of being lost as the younger generation is not interested in pursuing the trade and the elderly who are knowledgeable in medicinal plants are aging and passing away. There is a crucial need to build a brand for traditional medicine villages in Cham to provide advantages in business and medical care; however, despite public support, the dream of creating a brand such as 'Xuan Hai Herbal Medicine' or 'Cham Herbal Medicine' has not yet been realized.

The younger generation is well educated and pursuing other occupations, while the lack of a recognized brand for medicinal village has made it difficult for the Cham community to sell herbal medicines and provide medical examination and treatment, making it a challenge for them to make a living.

4.3 Challenging social stereotypes and bias towards Cham medicinal plant vendors

Social prejudices against Cham herbal medicine practitioners are a challenge to their livelihood and practice. Historically, Cham families practiced medicine, performing examinations and treatments that could last from 15 to 30 days. Today, due to economic pressure, Cham doctors must travel to sell medicine both to provide for their families and contribute to disease prevention. Despite carrying certificates and business cards, social media has led to them being labeled as ‘child kidnappers’ and ‘cheating quacks’. These prejudices have driven vendors away, causing them difficulty in earning a living from their ancestral profession (see Figure 6). When interviewed, some vendors shared their experiences of being chased away and falsely accused, despite the local police finding no evidence of fraud. These prejudices are a hindrance to the preservation and practice of traditional Cham medicine.



Figure 6. Cham women in traditional attire transporting bags of herbal medicine for sale and treatment. (Courtesy of the authors in 2018).

Despite the challenges they face, Cham practitioners of traditional medicine continue to travel far and wide to provide their services and sell their products. Their certificates and business cards serve as proof of their legitimacy, but societal prejudices persist, fueled by false rumors spread on social media. Despite all of this, these practitioners of traditional medicine remain steadfast in their commitment to their ancestral profession, enduring the hardships along the way.

The Cham people who sell *Thuốc Nam*, a traditional medicine, face many challenges due to misinformation on social media and social prejudice. This has led to a decrease in trust and income, with only 40% of families and clans maintaining the traditional medical profession. In addition, they face safety issues while practicing their profession, which has resulted in many choosing to work in other industries instead. The traditional medical profession is at the risk of being lost, with statistics showing a decrease in the number of families and clans practicing it. According to statistics from Xuan Hai Commune, the traditional medical profession, which was once practiced by 90% of families and clans before 1992, is now maintained by only 40%. This has led to insecurity among practitioners of traditional medicine, affecting their main source of livelihood. As a result, many people have changed professions and are no longer interested in preserving the cultural values and folk knowledge passed down by previous generations.

5 Solutions

To address the challenges facing Cham traditional medicine in Ninh Thuan Province effectively, it is crucial to protect and revitalize this important cultural and medical heritage. Local authorities should not only preserve the cultural history but also ensure the rights and safety of Cham practitioners, recognizing the economic significance of their traditions in Vietnam's southern central region.

To ensure the sustainability of Cham traditional medicine, organizing training workshops is necessary to equip practitioners with improved skills for sustainable harvesting and processing of medicinal herbs. This directly addresses the issue of resource depletion. Additionally, comprehensive strategies for managing, protecting, and restoring the biodiversity of medicinal herbs are essential.

This effort requires seamless collaboration among different government departments, including Natural Resources and Environment, Health, and occupational associations. These collaborative endeavors aim to provide consolidated advisory support to the Provincial People's Committee, focusing on strategic planning and management of medicinal herb resources. Recognizing Cham traditional medicine as a traditional craft and promoting geographical indications in Ninh Thuan are crucial steps in safeguarding the authenticity and heritage of these practices. This will raise the profile and awareness of Cham traditional medicine both regionally and beyond. To enhance sustainability and economic integration further, the development of medicinal herb gardens that are linked to cultural and health tourism offers an innovative solution. Encouraging the establishment of family-based conservation gardens and centralized gardens not

only helps preserve these traditions but also enhances their economic potential. Additionally, promoting the use of single and compound herbal medicines ensures a reliable supply for practitioners.

Finally, combining these initiatives by creating a comprehensive database, along with publications and promotional materials, is essential. These measures aim to preserve the intangible cultural heritage of Cham traditional medicine in Ninh Thuan and promote broader awareness and appreciation. This comprehensive strategy guarantees the longevity and continued relevance of these invaluable practices, connecting them more deeply with the wider community.

6 Discussion and conclusion

In this study, it was found that the preservation and promotion of the traditional medicine profession of the Cham people is crucial for the preservation of the Cham culture and its ethnobotanical knowledge. The Cham language plays an important role in the preservation of this knowledge, as it contains the names, uses, and descriptions of the medicinal plants and their properties. However, the loss of the Cham language and its speakers is a concern as it may lead to the loss of valuable traditional knowledge. The study also highlighted the importance of community involvement and support in promoting the traditional medicine profession and preserving the Cham culture. The Cham community can play a key role in raising awareness about the significance of traditional medicine, and, by working with local authorities, they can help protect the habitats of medicinal plants, promote sustainable harvesting practices, and support the revitalization of the Cham language.

The Cham community's traditional medical profession, which has been passed down from generation to generation, is facing numerous challenges in Ninh Thuan province. The spread of misinformation on social media labeling the Cham people as frauds and child abductors has led to a decrease in their income and a shift away from their ancestral profession. In addition to these social prejudices, the Cham people also face problems with the preservation and exploitation of medicinal plants, as well as a decrease in the number of families practicing the traditional medical profession.

Urbanization is a major challenge for the preservation of indigenous knowledge related to medicinal plants. As cities grow, natural vegetation and traditional agriculture is lost, leading to the degradation of medicinal plants and hindering the recognition, use, and management of these important resources (Sheng-Ji, 2001; Kasagana and Karumuri, 2011; Bukuluki, Luwangula, and Walakira, 2014; Güneralp, Lwasa, Masundire, Parnell, and Seto, 2018; Sanderson, Walston, and

Robinson, 2018; Arjona-García, Blancas, Beltrán-Rodríguez, López Binnquist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021). Despite these challenges, there are efforts underway to conserve medicinal plant varieties and the traditional knowledge of the Cham people. Our research found that local authorities and departments are actively working towards this goal through various programs and projects.

The Cham language, a crucial aspect of ethnobotanical knowledge preservation, is at risk. The loss of the Cham language results in the loss of traditional knowledge, cultural values, and information about the names and uses of medicinal plants, which have been passed down from generation to generation (Wilder, O'Meara, Monti, and Nabhan, 2016). The conservation and promotion of the traditional medical profession of the Cham people is important to ensure the preservation of their ancestral heritage, maintain their traditional livelihood, and promote the use and teaching of the Cham language to the next generation (Wilder, O'Meara, Monti, and Nabhan, 2016). With the loss of medicinal plants from the natural environment, the transfer of this knowledge between generations is also being lost (Arjona-García, Blancas, Beltrán-Rodríguez, López Binnquist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021). To counteract this, it is important to undertake research, documentation, and digitization of medicinal plants and their associated remedies, as well as to provide incentives and opportunities for the transfer of this knowledge to future generations (Salemink, 2012; Wilder, O'Meara, Monti, and Nabhan, 2016). This will ensure the continued preservation of this important cultural and medicinal heritage for future generations.

Like many other studies, the preservation of folk knowledge, including the traditional medical profession of the Cham community, requires active participation of the community itself (Augustino and Gillah, 2005; Heywood, 2017; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019). However, it is not enough to simply involve the community in conservation activities; they must also understand the significance and benefits of these efforts (Shukla and Gardner, 2006; Peterson, 2007). Previous conservation projects have failed due to a lack of proper implementation, which includes not taking into account the local context and failing to consider the practical needs of the community (Wilshusen, Brechin, Fortwangler, and West, 2002; Peterson, 2007; Selemani, 2020). For example, past initiatives focused on replanting medicinal plants in the Cham community, but overlooked the importance of raising awareness and educating the community about the role of these plants in preserving their ancestral heritage and maintaining their traditional livelihood (Augustino and Gillah, 2005; Hamayun, Khan, Sohn and Lee, 2006). Therefore,

it is essential to approach conservation efforts by linking them to the practical needs of the community and ensuring they are contextually appropriate in order to achieve sustainable conservation outcomes (Ulian, Sacandé, Hudson, and Mattana, 2016).

Furthermore, the preservation of Cham IK and traditional medicine in Ninh Thuan relies heavily on sustainable funding. This is evident when considering past externally funded projects, such as the \$50,000 Global Environment Facility garden project, and their impact on conservation efforts. It is therefore essential to secure both immediate funding and long-term financial strategies to ensure the continuity of these efforts. Financial limitations pose significant challenges for traditional medicine associations and researchers in their efforts to preserve medicinal plants and indigenous knowledge. This highlights the critical need for ongoing investment in conservation initiatives (Augustino and Gillah, 2005; Heywood, 2017; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019). The literature also points to a gap in sustaining project outcomes after initial funding, emphasizing the importance of diversifying financial strategies to build resilience and maintain long-term conservation achievements.

To enhance the financial sustainability of Cham IK conservation efforts, it is crucial to assess current funding mechanisms and explore new avenues of funding. This includes seeking international collaborations, establishing private partnerships, and seeking government support. By undertaking comprehensive financial planning, we can address both immediate conservation needs and ensure the long-term preservation of Cham cultural heritage and traditional medicinal practices.

The preservation of folk knowledge is a complex and multifaceted issue that requires the active engagement and participation of the community (Augustino and Gillah, 2005; Heywood, 2017; Da Silva, Hanazaki, Albuquerque, Almeida Campos, Feitosa, and Araújo, 2019). However, simply involving the community in conservation efforts is not enough. It is essential that these efforts be tailored to the needs and experiences of the community and that the community recognizes and values the importance of such efforts (Peterson, 2007). This is particularly true in the case of the Cham people, where past conservation projects have failed due to a lack of relevance and applicability to the local context (Wilshusen, Brechin, Fortwangler, and West, 2002; Peterson, 2007; Selemani, 2020).

One of the unique strengths of the Cham community is the presence of family medicinal gardens (*ben* in Cham) and wild fields (*puh-cakak* in Cham), which have been maintained for generations and serve as a source of diverse medicinal plants (Selemani, 2020). This offers a valuable opportunity for the conservation

of rare medicinal plant varieties as each family can take responsibility for cultivating and maintaining their own plants. This approach aligns with previous research that highlights the importance of home gardens in the conservation of medicinal plants (Maunder, Higgins, and Culham, 2001; Havens, Vitt, Maunder, Guerrant, and Dixon, 2006; Idohou, Fandohan, Salako, Kassa, Gbèdomon, Yédomonhan, and Assogbadjo, 2014). In contrast, public gardens that have been implemented by past conservation projects have proven less effective in conserving medicinal plants and meeting the needs of the community. Therefore, it is crucial that local authorities prioritize the development of family-level and village-level medicinal plant sources as this will not only ensure an abundant supply of medicinal plants but also minimize the exploitation of wild populations. This will be a decisive factor in the survival of the Cham traditional medical profession and highlights the need to link conservation efforts to the practical needs and experiences of the community.

The conservation of medicinal plants and IK of indigenous communities have been linked to economic and social benefits as demonstrated in several studies (Phillips and Meilleur, 1998; Maunder, Higgins, and Culham, 2001; Palabaş Uzun, and Koca, 2020; Arjona-García, Blancas, Beltrán-Rodríguez, López Binnqüist, Colín Bahena, Moreno-Calles, and López-Medellín, 2021). Our research sheds light on the intricate relationship between the preservation of medicinal plant species and the development of the livelihood of the Cham community. Our findings reveal that the loss of valuable medicinal plant varieties and the neglect of the traditional medicinal practices have significantly impacted the economic well-being of the Cham people.

Furthermore, the role of indigenous knowledge and traditional health systems, including medicinal plants, is gaining recognition from policymakers as an important aspect of healthcare and development (Shukla and Gardner, 2006; World Health Organisation, 2009). However, the traditional medical practice of the Cham people has not been officially recognized by the state, making their business activities more challenging. Furthermore, widespread social discrimination against the Cham local herb vendors, including allegations of hypnosis, fraud, theft, and kidnapping, has made the community reluctant to continue practicing their ancestral cultural heritage values. As a result, the Cham community is turning away from their traditional profession, which is leading to a decline in the preservation of medicinal plant varieties and indigenous knowledge about medicinal herbs.

To conserve the valuable indigenous knowledge and address the associated challenges, it is crucial for local authorities to officially recognize the traditional

medical practice of the Cham people as a traditional craft village, in line with the suggestion made by Shukla and Gardner (2006) regarding the recognition of medicinal knowledge. This recognition would guarantee the safety and right to practice this medicine, which holds deep historical, economic, and cultural significance for the Cham ethnic group in the South Central region of Vietnam. Furthermore, by acknowledging the traditional craft village, there is potential for establishing on-site medical facilities within Cham villages, enabling local medical examination and treatment, as well as creating opportunities for indigenous tourism activities. Through the consolidation and development of traditional trades and craft villages, regions can leverage their inherent strengths to generate goods along the value chain, thereby contributing to the shared objective of sustainable development.

In sum, this study explores the role of indigenous knowledge in medicinal plant conservation and its impact on the livelihood of the Cham community. Key findings include the importance of preserving the Cham language for ethnobotanical knowledge, the close relationship between medicinal plant conservation and livelihoods, and the need to leverage traditional Cham experiences for biodiversity conservation. The study emphasizes the significance of preserving Cham cultural heritage and traditional knowledge through the conservation of medicinal plants. These insights contribute to the field of indigenous knowledge preservation and highlight the importance of sustaining the Cham people's traditional medical profession. The study also highlights the potential for community-based tourism centered around the Cham people's traditional medical practices, providing opportunities for economic development and raising awareness about the importance of preserving indigenous plant knowledge, language, and heritage. Further research can explore the development of community-based craft village tourism to support local communities and overcome challenges.

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Baskets of wisdom: Bahnar basketry, folk taxonomies, and the maintenance of upland environmental intelligence in Vietnam

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Abstract

The backpack basket has become an iconic element of Highlanders' culture in public media and cultural heritage representations in Vietnam. The dominant Vietnamese language in those domains has only one term, *gùi*, to denote the most common types of ethnic backpack baskets, despite each group creating very diverse basket types. The use of outside overgeneralized terms can potentially contribute to cultural stereotypes and consequently hide diverse Indigenous cultures and knowledge. Our research focuses on baskets of the Bahnar (or Ba Na) ethnic group in the Central Highlands of Vietnam. In this research, we explore the richness of the Bahnar cultural and environmental knowledge contained in their diverse types of baskets and narratives about basketry. Related folk taxonomies are evidence of how the Indigenous groups precisely classify the natural and cultural world they live in and interact with.

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1 Introduction and review of literature

What can we learn from Bahnar basketry? Baskets in Vietnam play cultural roles similar to those described by Zhang, Jackson, Dewhurst, and Kay (2022: 242) in southern China: ‘Beyond their crucial use in life-sustaining and life-enhancing labor, their central place in key social and spiritual activities suggests that they are a fundamental element in people’s lives in this region, despite their sometimes taken-for-granted status’. In a broader view, basketry knowledge has, as Novellino and Ertuğ (2019: 619) explain, ‘significant ecological ramifications, as it includes specific strategies for the sustainable management of plant resources’.

Like Zhang, Jackson, Dewhurst, and Kay (2022), Bunn and Mitchell (2020: 111) describe basketry as ‘an understudied and underappreciated discipline’ in which ‘local knowledge of materials, plants and place are central to the craft’. To emphasize the importance of basketry in a particular culture, they argue that baskets embody both knowledge of and care for ‘the social and natural environments in which it flourishes’, are ‘inherently sustainable’ and also serve as a repository of ‘memory, belonging, and evocation’. Baskets transmit cultural values and stories, as Novellino and Ertuğ (2019:619) explain: ‘The skill required in the production of these objects is often associated with factors such as people’s perceptions of the environment, conceptions of the self and modes of economic interaction, social hierarchy, and division of labour’. As Mitchell (2020: 111) notes, basketry embodies both ‘cultural narratives and social identities’ of basket makers. She explains:

While baskets conveniently contain goods to be carried it is also the case that basketry, in the breadth of knowledge which it articulates, additionally functions to carry stories and modes of wisdom-making, many of which are rooted in the deep past and allude to culturally poignant symbolic narratives in the present; for all its apparent simplicity, it can serve as a locus of power and a container of complex history and heritage. (Mitchell, 2020: 112)

Guss (1989: 91) continues the theme of baskets as cultural memory repositories: ‘Baskets provide a culture’s expressions of the [...] conceptualization of the universe’ and are ‘intended as portraits of the society that inspired them’. Dear (2020: 113) observes how: ‘[t]he memory of making is embedded within the skill, the knowledge of the material is encoded within the making’.

Besides these important social functions, basketry has been recognized as the most skillful manual activity and art form in the region. Condominas (1977: 13) writes of the Mnong Gar people in neighboring Đắk Lắk province: 'it is in basketry that the men of the forest demonstrate their greatest mastery. Using bamboo and rattan, the men make numerous types of baskets [...] that are widely used'.

In Vietnam's cultural context, backpack baskets have become one of the iconic elements of minorities' culture in public media and heritage representations. However, the work of cultural representation-making seems to go hand in hand with the simplification of local indigenous and diverse knowledge. One example is the simplified translation of ethnic groups' basketry terms into Vietnamese. For instance, in these areas Vietnamese has only one term, *gùi*, to denote the most common types of ethnic backpack baskets, despite each group creating very diverse basket types. The use of outside overgeneralized terms can potentially contribute to cultural stereotypes and consequently hide diverse indigenous cultures and knowledge. Thus, the basketry of various ethnic groups in Vietnam is somewhere between 'taken for granted' and 'understudied', yet highly generalized as one of the minorities' cultural representations. This situation calls for close ethnographies that explore in detail Bahnar Traditional Ecological Knowledge (TEK), cultural stories, and many other social aspects that are contained in their baskets.

Our research focuses on baskets of the Bahnar (or Ba Na) ethnic group in the Central Highlands of Vietnam (see Figure 1 here below). In this research, we explore the richness of the Bahnar cultural and environmental knowledge contained in their diverse types of baskets and narratives about basketry. Indeed, the richness of Bahnar TEK also contains and showcases the diversity of different types of baskets and related terms. The Bahnar in Kon K'tu village produce various categories of baskets that differ according to the gender or age of users, landscapes (forest or village), and uses. Notably, the Bahnar have a specific name for each basket type and vernacular terms for different steps of weaving and plants used to produce their baskets (see Table 1 and Table 2 in the Appendix). Thus, in this paper, we argue that although Bahnar folk taxonomies, particularly related to basketry in this case study, have remained veiled and undocumented, they perform a function in preserving Bahnar cultural and ecological knowledge. We also argue in this paper that Bahnar folk taxonomies – which classify various types of baskets and plants – are essential to biodiversity conservation. Moreover, Bahnar basketry serves as a vessel for environmental intelligence, by which we mean not only TEK but also the cultural ability to sense and adapt to environmental changes. The Bahnar basket as a manifestation

of environmental intelligence is a good example for Siebert's (2012: 2) broader argument that '[r]attan-based societies that productively utilized and conserved biologically diverse tropical forests may also provide modern civilization with useful approaches to living with and valuing nature'.

This paper starts with general information about the Bahnar in their historical, cultural, and environmental context. We then explore the diverse Bahnar environmental knowledge embedded in basket taxonomies, techniques for teaching and learning basketry, and the uses of baskets in economic and ritual contexts (see Figures 2 through 6 in the Appendix).

2 The Bahnar community

Bahnar is among the main indigenous groups in Tây Nguyên – the Central Highlands of Vietnam. They speak languages that belong to the Bahnaric group (Sidwell, 2002) within the Mon-Khmer (Austroasiatic) language family (Bùi, 2006). Within the shared ethnicity of Bahnar, there are separate branch groups such as Kontum, Jolong, Rongao, Golar, Konkodeh, Tolô, Kriêm, and Bonâm. The Bahnars live mainly in the two provinces of Kon Tum and Gia Lai in the Central Highlands (Figure 1). With a population of ca. 300,000 in 2019 (Ban chỉ đạo tổng điều tra dân số và nhà ở Trung ương, 2019: 160), Bahnar is the largest ethnic group that speaks a Mon-Khmer language in the Central Highlands (Bùi, 2006:13). The estimated speaker population in 2021 was 200,000 (Eberhard, Simons, and Fennig, 2022). Most Bahnars are bilingual in Bahnar [*bdq*] and Vietnamese [*vie*] and also understand Jrai [*jra*]. The use of Bahnar language in the community is vigorous among all age groups. According to Bahnar naming conventions, all male members of the ethnic group use the surname 'A' which appears in the first position, followed by their given name. Bahnar women use the surname 'Y', followed by their given name.

Before the French colonial 'protection', according to Nguyễn and Nguyễn (2011[1937]: 193), 'each Bahnar village was a completely independent little kingdom that did not submit to any other dominance'. During this period, every Highland village was led by a traditional chief (*bok kara*) who occupied a particular territory. Despite their relationships with neighboring lowland powers, the highlands were still very strange and mysterious to the lowland Vietnamese until late in the nineteenth century. It was not until 1848 that the mysterious highlands were opened up to outsiders following the successful establishment of Vietnamese missionaries and French Catholic priests in Kon Tum Province.¹ The environmental condition surrounding the Bahnar at that moment is recounted by missionary and ethnographer J. P. Combs (1873: 406) as follows: 'All this

country is covered with a continuous and compact forest, that the ax of the savage will strike down little by little, but which rises again and repairs its breaches with astonishing promptness and vigor’.

After the French colonial period, the Highlands were involved in various wars and conflicts until 1975. Indeed, throughout their colonial regime in Indochina (from the late nineteenth century to 1954), the French maintained their colonial minorities strategy and policy to keeping the Central Highlands and its Indigenous population strictly separate from lowland Vietnam, to prevent the Montagnards² from falling under the influence of the Northern Communist government (Salemink, 1994). It was, as Hickey (1982a: 385) puts it, ‘the first time that any highland people had participated in a nationalist political movement’. After the fall of the French colony (1954), the highlanders were involved in the Second Indochina War (1954–1975), which only ended in 1975 with the final victory belonging to the Northern Communists. When the war ended, the Central Highlands were integrated into a new united nation of Vietnam.³

The Central Highlands have a high level of biocultural diversity. They are recognized as part of a language hotspot (Anderson and Harrison, 2006; Harrison, 2007), home to 29 of Vietnam’s 110 listed languages (Eberhard, Simons, and Fennig, 2022). Cultural diversity directly supports biodiversity, and the two are interlinked in ways that are not yet fully understood (Maffi and Woodley, 2010). As Pretty et al. (2009: 100) suggest, ‘any hope for saving biological diversity is predicated on a concomitant effort to appreciate and protect cultural diversity’. The Highlands are among the ‘most biologically diverse [...] [and] largest contiguous forest habitats in the world’ (World Wildlife Fund, 2020). Due in part to this rich ecosystem, forests have been the lens through which both outsiders and government agencies have long sought to define and control the Bahnar people (McElwee, 2016). For example, the Ministry of Agriculture and Rural Development (2011: 4) reports that a defining feature of ethnic minority groups in Vietnam is their ‘collective attachment to geographically distinct habitats or ancestral territories ... and to the natural resources in these habitats and territories’. The report also notes that ‘[a]lthough swiddens are not formally recognized, the practice is largely tolerated by local authorities due to its importance for households’ (Ministry of Agriculture and Rural Development, 2011: 17). The Bahnar relationship to the forest is both grounded in ancient traditions and controlled by modern economics and government policy (McElwee, 2016).

The Bahnar in our case study are the Bahnar Jolong branch, living in Kon K’tu village (Đăk Rơ Wa Commune, Kon Tum Province). This village – with a population of ca. 800, almost entirely ethnic Bahnar – is located just seven kilometers southeast of Kon Tum City, which is located in south-central Vietnam

(see Figure 1). Tourism was promoted about ten years ago because of its proximity to Kon Tum City, its beautiful landscape (Đăk Bla River, hills, and woods) and its traditional layout, with houses surrounding a traditional communal *rông* house. Newspapers promote it as a community imbued with Bahnar cultural identity, as evidenced in the traditional *rông* house, festivals, gong music, and *xoang* dancing. The primary economic activity of the villagers is the cultivation of rice and industrial crops (coffee, rubber, acacia). The Bahnar are known for their close economic and spiritual relationship to the forest, which they use for hunting, wild plant harvesting, and swidden cultivation.

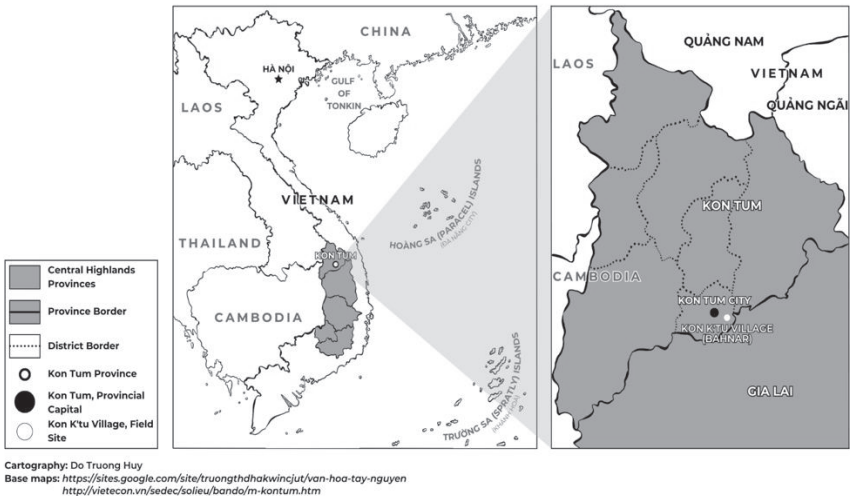


Figure 1. Map of Central Highlands showing the location of Kon K'tu village in Kon Tum Province and neighboring Gia Lai Province.

3 Basketry of the Bahnar people: Understudied diversity

Basketry is mentioned, at least in passing, in ethnographic works from all over the world dating back over a century. Colonial accounts describe Bahnar plant-based technologies, communal house construction and basketry, and sustainable forestry. Combs (1873: 427) describes the construction techniques of a Bahnar *rông* house – which, like Bahnar baskets, is made entirely of plants – and notes how a “small basket with seven or eight eggs” is used in a healing ritual. In historical photos from the 1930s (Nguyễn and Nguyễn, 2011[1937]: 25–29), Bahnar women are shown carrying heavy loads such as firewood in baskets.

Even though our ethnographic data in this paper show a variety of Bahnar basket terminology, historical lexicographic texts of the Bahnar language have

not captured this diversity of terms. Indeed, the earliest Bahnar-French dictionary (Dourisboure, 1889) lists many environmental terms but lacks names for baskets. In a later Bahnar-French dictionary (Guilleminet and Alberty, 1959–1963: 33) a basket called *bai* is defined as: ‘Coarsely made basket used to transport earth, rubble, etc. Small basic conical baskets that the Jolong fix to the *haiuk* mast during the buffalo festivals and which are the *tăng dõ* seats of the invited Genies [...]’. In the Bahnar-English dictionary (Banker, Banker and Mõ, 1979: 8), by contrast, this same *bai* basket is defined simply as ‘a small bamboo basket’.

In contrast to the limitation of historical lexicographic texts on acknowledging Bahnar basket-related terms and the recent highly simplified baskets such as *gùi* in Vietnamese, our ethnographic study yielded a variety of baskets (see Table 1 in the Appendix). First, we recorded at least seven different types of Bahnar backpack baskets. The Bahnar have an exact name for each particular type. They weave each kind in different shapes, characters, and ways of construction to use for their specific living purposes. For example, they create the basket *hro* or *jop* in a pretty simple style with an open top to use in daily general transportation tasks (like collecting wood and vegetables from the forest or water from the village stream home). Another more tightly woven basket called *Xơ Kã tơ hla* is used to bring foods to the rice field or textiles during trading trips to other villages in the past. *Krôih* and *Xơ kã* are two basket types that are used mainly for men’s hunting trips in the woods. Their flat and close-fitting shape helps the hunters move more easily in the forest and conceal hunted animals while going back home. Besides various outdoor baskets, the Bahnar also have indoor ones tightly woven with detailed decorations and a cover (*ko nel*). There are *Hjác* to store family goods such as clothes or *H’kã* to keep harvested rice at home and seeds for the coming crop.

Thus, our findings uncover various categories of baskets produced by the Bahnar in Kon K’tu village that differ according to gender, age, landscape (forest or village), or purposes of use. The diversity of different types of baskets and related folk taxonomies is evidence of the richness of Bahnar material culture and, as will be developed further in the following section, on Bahnar environmental knowledge.

4 Baskets and environmental knowledge

Folk taxonomies are also evidence of how the Indigenous groups precisely classify the natural and cultural world they live in and interact with. Bahnar baskets are made from various types of forest plants such as bamboo (*sao*), rattan (*hre*),

and wood (*hlang*).⁴ The kind of botanical knowledge required is not primarily about the species of plants used – as these are limited to a few – but rather in the exact qualities of the plants and knowing how, when, and where to harvest and process the materials.

Baskets are a repository for environmental knowledge. Kerfant (2022: 123) explains the detailed plant knowledge required to make fiber-based objects:

Handicraft is mostly made out of vegetal fibers of specific properties, such as limited length, flexibility, unputrescibility, among others. These fibers are usually prepared through the use of different techniques and are made into containers, nets, ropes, sails, and others, with every kind of production representing a unique knowledge of plant physical property.

Our discussions with Bahnar experts confirmed that they possess extensive plant habitat knowledge, acquired through copresence in the forest with knowledgeable elders. They also acquire knowledge of plant properties through countless hours of basket-making activities. In Table 1 (see Appendix), we list 18 types of baskets we documented in the Kon K'tu Bahnar community. These may be contrasted with the 14 basket names from the Plei Bong-Mang Yang dialect shown in Table 2 (see Appendix) (Banker, Banker and Mör, 1979).

For the Bahnar, basketry both presupposes and perpetuates a trove of environmental knowledge. To reach the minimum level of technical precision, an aspiring basket maker must have already spent countless hours collecting and processing materials, and accumulating knowledge. Basketry lore thus connects to the environment at many different points. For example, in addition to botanical knowledge, baskets may reference astronomical knowledge. The Bahnar recognize and name two constellations after the backpack basket. Bahnar constellations *Hong long Kroh Rok* (*Hong long* means 'stars') and *Hong long Kroh Xet* are named for two backpack baskets (Nguyễn and Nguyễn, 2011[1937]: 60). A Bahnar riddle asks: What is 'a basket of peppers scattered all over the area?' Answer: 'The stars' (Nguyễn and Nguyễn, 2011[1937]: 459). This is an example of how the Bahnar connect their material culture with nature.

The scarcity of certain plants tells us about the health of the forest and is part of a key environmental indicator, namely, '[i]ntensity of use of forest resources' (OECD, 2008). The sustainable use of forest resources is a prerequisite for basket production while baskets also reflect the availability of the component plants. As Costanza et al. (2017: 435) point out – in the case of black ash (*Fraxinus nigra* Marsh.) in North America – when a cultural keystone species becomes endangered, so too may a 'centuries-old basketry tradition' that has both cultural and spiritual significance become endangered. For the Bahnar, as for many other

Southeast Asian peoples, rattan, also known as climbing palms (*Calamus* sp.), are cultural keystone plants of crucial importance for basketry and many other economic uses. As John Dransfield (Siebert, 2012: ix) notes:

In the rainforests of the Southeast Asia region [...] rattans occur in abundance – or at least they used to [...]. Wherever they occur, they have been utilized to varying levels of intensity, supplying instant cordage, material for basket and mat weaving and bridge building, kitchen utensils, dyes, medicines, and thatch, all overshadowed by their great importance as a traded commodity, the raw material for the cane-furniture industry.

Siebert (2012: 2) characterizes the ‘rattan civilizations’ of SE Asia as an example of vanishing life, both natural and cultural: ‘Rattan and the cultures that developed [around it] [...] and the forests upon which they depend provide glimpses into a receding world characterized by different ways of living, knowing, and being’. Rattan supplies have been in decline since the 1970s, and in Vietnam this increasing scarcity has been noticed by the Bahnar and affects them in the present day. Indigenous use and conservation strategies for rattan in Vietnam are supplemented by external interventions, such as a USAID-funded program to help farmers grow new rattan from seedlings and sustainably harvest existing rattan (Vietnam Times, 2019). But when rattan is not readily available, Bahnar may substitute plastic, particularly for the shoulder straps of their most iconic basket *Xơ Kã tơ hla*.

Some types of basketry technology are being lost not due to scarcity of materials, but because of socioeconomic changes. Preston (2016), documenting local types and designs of basket or part-basket boats in Vietnam, concludes that some basket boat types exist only as remnants and are no longer being actively made, such that the technology will soon be forgotten. As Siebert (2012: 3) notes, ‘there is tension between rapidly vanishing resources, knowledge, and cultures on the one hand and the potential that rattan, forest communities, and tropical forests may continue to materially and culturally enrich humanity in the future’. This tension is also noted in a World Wildlife Fund (2021: 1) report on Vietnam: ‘Few places on the earth demonstrate so dramatically the fundamental dependence of humans on natural ecosystems’. The Bahnar community in Kon K’tu embodies this interdependency and is attempting to preserve both basketry and forest knowledge to the benefit of all humanity.

5 Teaching and learning basketry

The transmission of local knowledge via observing, learning, and practicing making baskets has become a crucial cultural practice of the Bahnars over

generations. In the Bahnar community, young men are expected to learn and practice basket weaving. According to A Hung (coauthor of this paper) and other Bahnar consultants, a young man who does not know how to weave a backpack basket would be judged to be lazy and find it much harder to marry a woman in his community. To evaluate a hard-working man, people in the village often look at his hands. If a young man's hands are full of calluses and tree sap, and his fingers have many cuts from bamboo, he would be considered a hard-working man who knows how to weave baskets.

Basketry is mostly done by men and taught to boys who show interest and aptitude. Boys may go to the rice terraces and adjacent forests with their fathers, staying for up to a week to protect their rice (especially near harvest time) from birds and monkeys. While at the rice field, they collect plants to make bamboo noisemakers (*tạ plă*) and put them everywhere in the rice fields to ward off animals. During their free time at the fields, they also collect bamboo, rattan, and forest leaves to make musical instruments. The father makes flutes or a Bahnar guitar (*tin h ninh*) to play and sings traditional songs, providing entertainment during the long days and nights in the forest. They also save time by making baskets (mostly backpack baskets) and collecting more raw materials to bring back to the village.

A Hung recalls that, at age 4 or 5, he began to experiment with plant materials. He often came along with his father to observe and learn how his father collected raw forest materials to make musical instruments and baskets. This was how he gradually knew what the required, suitable, and good quality materials for particular purposes are and where to find them. By joyfully and carefully watching his father weaving backpack baskets, he had gradually learned and practiced weaving since he was about ten years old.

It took A Hung a lot of time to learn how to make a backpack basket. The hardest part of the work was not weaving but processing materials. He found it was not too difficult to weave strings of bamboo and rattan to gradually build a backpack. But it was extremely challenging for him to process collected raw bamboo and rattan into strings that would be thin, well made, glossy, fairly long, and stable enough to do the next and more enjoyable weaving part. In the beginning, he often accidentally broke the bamboo strings. He got cuts on his hands from the bamboo, and these serve as a visual symbol in the community of his industriousness and later suitability for marriage. He could typically prepare only three or four out of dozens of bamboo strings needed to make a basket. He sometimes needed practical advice and guidance from his father to overcome this challenge. In his words:

[M]ost importantly, I have to learn and to feel for myself the good feeling of the materials on my hands while processing the strings. I have to feel right about the softness, thinness, stableness, or fineness of the bamboo to make good bamboo and rattan strings for the weaving. No one can teach that feeling.⁵

It was not until he was about 13 or 14 years old that A Hung completed a basket that his father considered to be adequate. He remembers the moment when he finished a backpack basket and showed it to his father. Looking at the basket, his father said: 'You got it done. It is good'. From that moment on, A Hung could be more confident in independently making backpack baskets himself. He can also customize a basket to the height and body size of its intended user.

As with ritual performance, Bahnar basketry is learned informally, and the learner must take the initiative:

We do not have focus classes to transfer folk skills as those organized by the local Department of Culture in recent years. If someone in the village wishes to learn folkways (*kon kong*) of weaving baskets or cotton, playing the gongs, making jar wine, etc., they themselves initially have to show strong interest in these particular skills. With that interest, in daily life, they would pay exclusive attention to how people of older generations do these particular skills and gradually practice along. It is how we learn from the elders to do things. (A Bën, Kon K'tu village chief)

Like other Highland groups, the Bahnar have plenty of free time in their agricultural cultivating calendar to do weaving. They might be busy in some weeks with particular work such as cleaning and processing the fields, sowing, and helping one another to harvest. During the remainder of the year, they devote their time to many other things besides taking care of the rice fields and protecting their fields from wild animals. When they are in the rice fields and very close to forest materials, Bahnar men weave baskets in their free time. Advanced age allows more time for basketry, as Schliesinger (1997: 44) notes: "Each member of the hill tribe family undertakes tasks to which they are best suited [...] people too feeble or old for heavy labor perform light tasks such as making bows and arrows or baskets".

6 Economic and ritual uses of baskets

The Bahnar production and selling of baskets relies on trading networks characterized by both personal and impersonal exchange (Marroquín Gramajo, 2007). Within the community, they weave backpack baskets for daily use, and these may be custom sized for the intended wearer. They also sell baskets in the local market. For example, A Hung often sells his baskets to a Vietnamese vendor

who owns a shop near the district market. Responding to the market's needs at a particular time, the vendor had asked A Hung to make a specific type of backpack basket and verbally agreed on the price in advance.

Once I (author #1) went with A Hung to bring his woven basket to the vendor's shop. The female shop owner had asked A Hung to make the *Reo* backpack because schools in Kon Tum City needed backpack baskets for their Bahnar and Jrai students to use in cultural performances at schools. When we arrived at the vendor's shop, A Hung became upset when he handed over the baskets to the female vendor. The woman complained that the baskets' quality was not what she expected, even when A Hung tried to argue that he had done a good job and guaranteed the quality of the baskets. Thus, instead of paying 100,000 VND (approximately \$4) for each basket, she insisted on paying only 50,000 VND for each. After a short argument, A Hung decided to accept the low price and left. A Hung confided that he felt that the vendor had cheated him, and that this would definitely be the last time he would do business with this vendor.

A Banh, the former chief of Kon K'tu, often produced a dozen backpack baskets when the Catholic nuns asked him to help. Catholic nuns from Kon Tum City come to the village weekly and use A Banh's place to cook rice soup for kids of poor families. Thus, the nuns have a close relationship with A Banh and his wife (Mẹ Xoi) and often ask A Banh to weave *H'ro* baskets. They plant many vegetables in the church garden and thus need *H'ro* as more practical and suitable than other types of backpacks for collecting vegetables. A Banh's wife explains his weaving as a way for him to help the church. Still, the nuns pay him 100,000 VND for each *H'ro*. Often, the nuns give not only money but also friendly gifts, such as vegetables and bananas from the church garden. Thus, in this exchange, *H'ro* backpacks transfer reciprocal support from each side to the other. In Catholic rituals, the chief will sometimes gift empty baskets to the church and in return receive some gift food or money from the nuns to buy food for the village children.

Baskets may undergo 'heritagization' (Zhang, Jackson, Dewhurst and Kay, 2022) when used for stage performances, as a marker of ethnicity, or by other (Kinh) ethnic performers who want to impersonate ethnic minorities on stage. Near the bridge in Kon Tum, there is a shop that sells attire and other accessories for stage performances. The baskets they sell are more colorful and of lesser quality, as they are intended for tourists or for stage performers. It is a place to quickly acquire baskets of lesser quality, but also smaller and more colorful than daily use baskets for work. In 2022, Vietnam Airlines created an onboard safety video featuring actors in stereotypical ethnic minority dress. In the video, they place traditional drums in the airplane's overhead compartments, and place

baskets in an upright position under the seats. This positioning does not reflect reality, as airline seats have an under-seat height of only 20cm, whereas Bahnar *H'ro* baskets are much taller. The baskets shown in the video are of a much smaller size, used as stage props, and an example of heritagization.

During graveside visits in the cemetery – located just inside the perimeter of the village – Bahnar bring baskets filled with rice, wine jugs, and sweets, both to offer to deceased ancestors and for the mourners to eat on site. When someone dies and has been buried, the family will leave *H'ro* or *Reo* baskets that the dead person used to use at the grave. The baskets will remain permanently tied to the bamboo fence that surrounds the grave as shared property of the family with the member who has just died.

7 Conclusions

Summing up the current situation of Bahnar traditional basketry, A Ben described the *H'ro* / *Jop* as ‘the backpack basket that we now most often use in our daily life’. Bahnar villagers, in recent years, prefer using modern wood or plastic containers to replace the traditional functional uses of baskets. They may use plastic bags (recycled from fertilizer bags) as backpacks to replace the closed-top basket *Krôih*. They also use plastic bags, instead of the *H'kă*, to store rice at home. Moreover, most families now keep their clothes in a simple wooden wardrobe instead of using the *Hjác*. A Bê and A Hung's children, in their twenties, could not name as many backpack basket types as their parents did for us. In other words, socioeconomic and lifestyle changes are causing the rapid loss of many baskets, thus threatening the diversity of local culture and environmental knowledge.

Despite the situation of loss, we can still observe and learn the beauty and richness of Bahnar culture via their basketry. On the one hand, as we mentioned, backpack baskets have become one of the Bahnar's essential cultural items and indicators in heritage practices and performances, under the general name of *gùi* (‘basket’). In his village homestay, A Bê displays a collection of many types of Bahnar baskets. He joyfully taught us Bahnar folk taxonomies for the diverse basket types, natural materials, and practical uses of baskets. ‘It is our *kon kong*’ (mountain and forest lifestyle/tradition), A Bê concluded his teaching about Bahnar traditional basketry practices.

Both the government heritage efforts and local experts' cultural explanations show us the life of Bahnar diverse cultural and ecological knowledge in the modern context. In addition to everyday life uses and practices, basketry has been emphasized as a valuable tradition needing protection. According to Meeker

(2007: 15), ‘an awareness of loss’ is necessary to the emergence of a concept of ‘tradition’. In the case of Bahnar baskets, we observe the somewhat complex current situation of local knowledge, where some parts are still being practiced, some are being lost, and certain selected meanings have become Bahnar cultural representations on the heritage stage. In the village, experienced local experts as A Bên not only ‘silently keep’ the tradition (Trần, 2022: 140), but publicly display and teach it to others, using the Bahnar language as the vehicle. The Bahnar possess rich and diverse knowledge of nature and culture. They emplace this in ‘baskets of wisdom’, which not only contain but also transfer the knowledge to the next generation and to the world.

Acknowledgments

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Notes

1. For a comprehensive description of the initial penetration of Catholicism into Kon Tum, see Pierre X. Dourisboure's memoir *Les sauvages Bahnars* (1873).
2. *Montagnard* (French) signifies a mountain dweller and is a carryover from the French colonial period in Vietnam. In Vietnamese, mountain peoples are called *người Thượng* (lit. 'Highlanders').
3. For comprehensive chronicles and observations on history and modern wars in the Central Highlands, see Hickey (1982a, 1982b, 1993) and Saleminck (2003).
4. We are currently investigating the full range of plant species used, to report in future research.
5. Narratives by coauthors A Bên and A Hung were recorded in field notes and audio-video recordings in a mix of Bahnar, Vietnamese, and English, then transcribed and translated into English by the first author of this paper, assisted by Phạm Duy Khôi.

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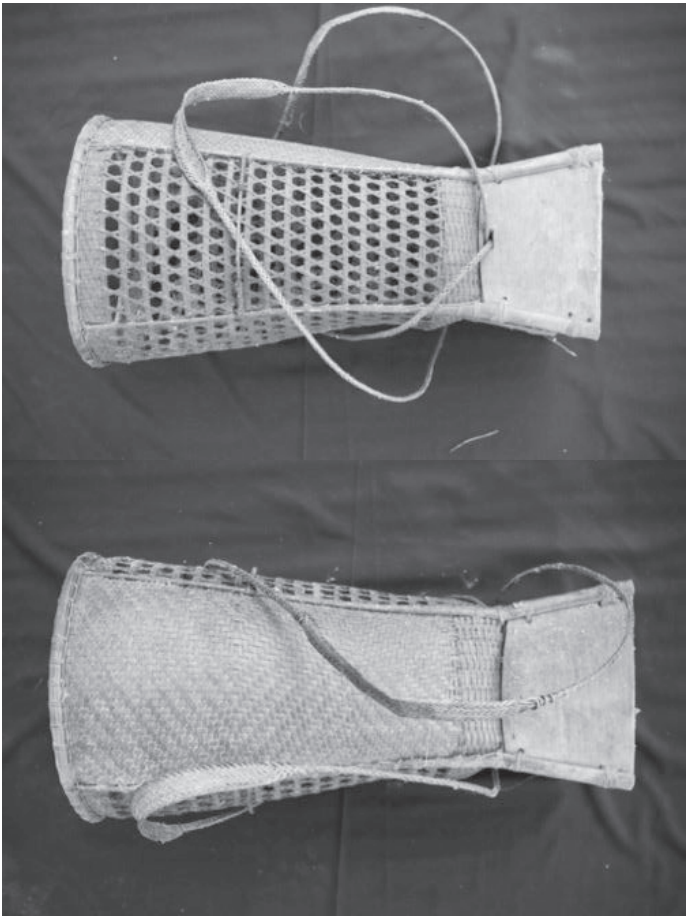
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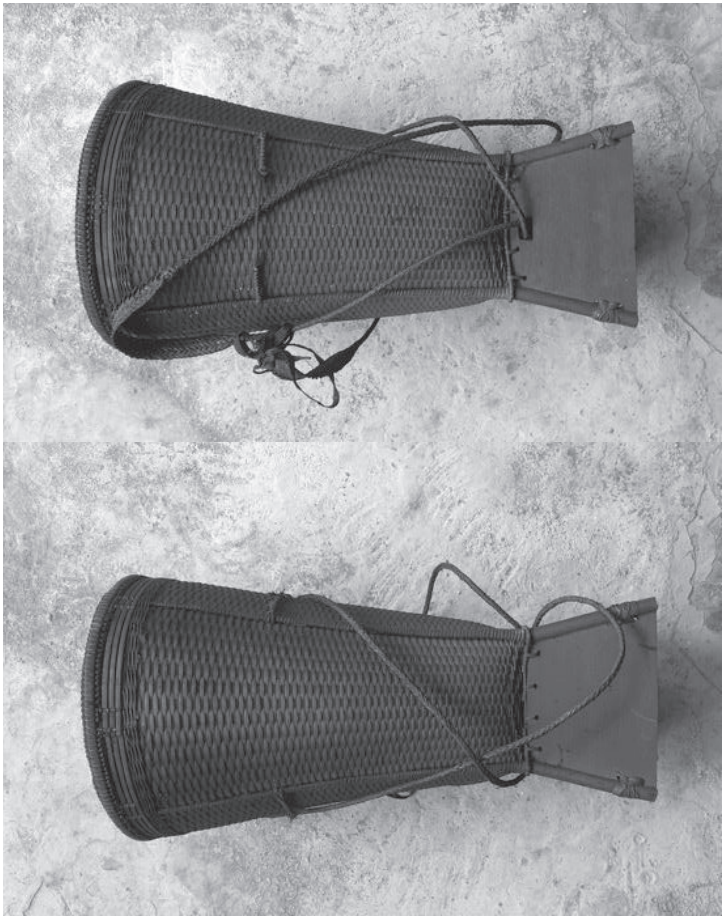
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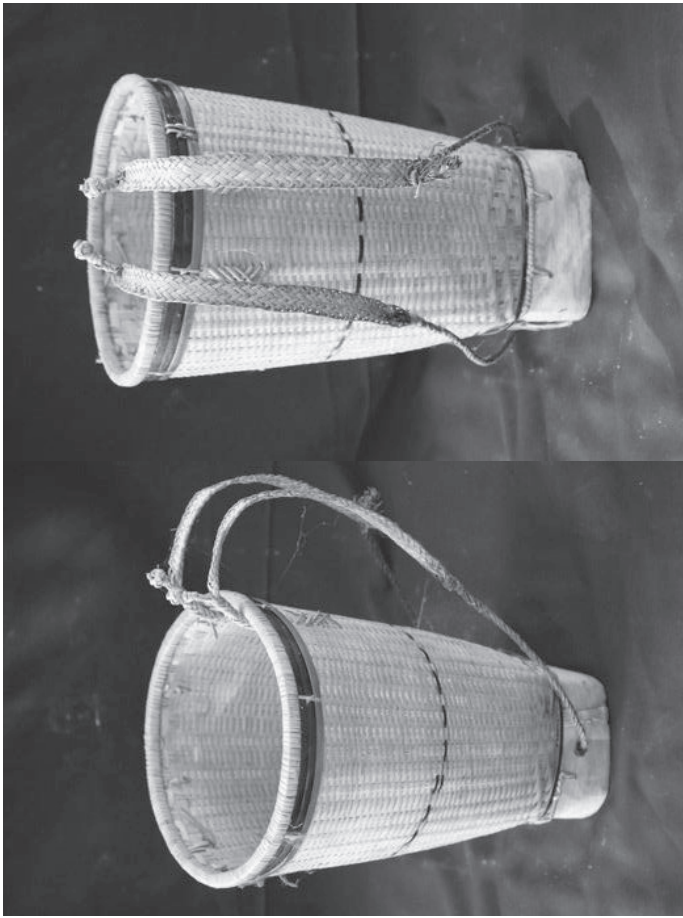
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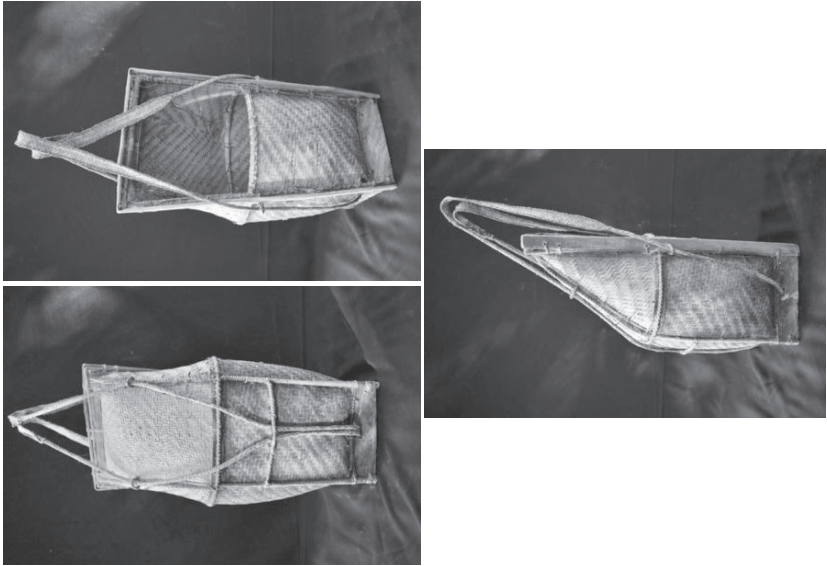
Appendix: Tables 1 and 2, and Figures 2 to 6.

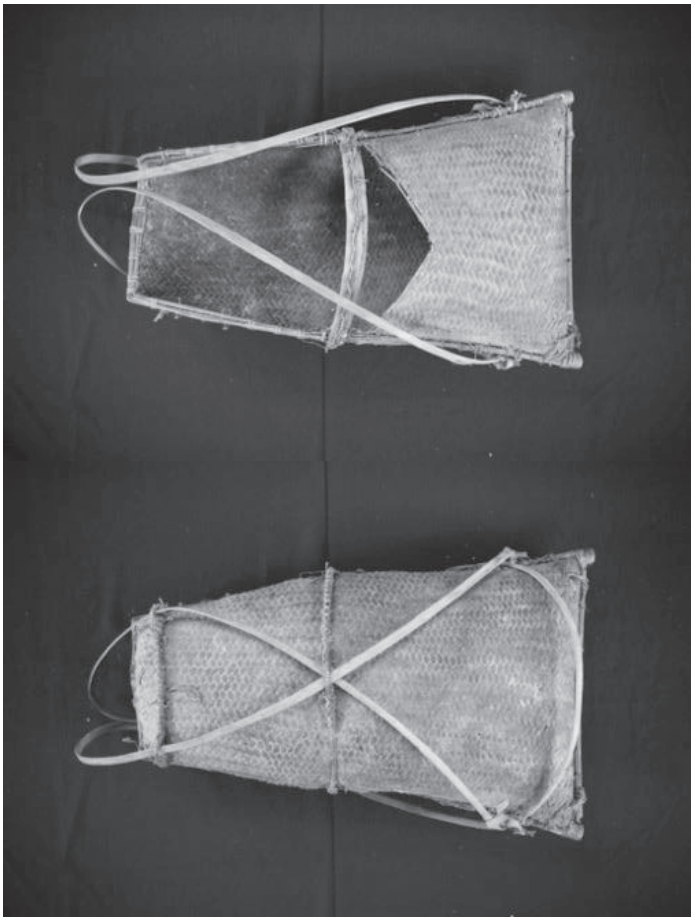
Table 1. Bahnar basket names, uses, and pictures (Photos by Đỗ Trường Huy, K. David Harrison, and Tran Hoai).

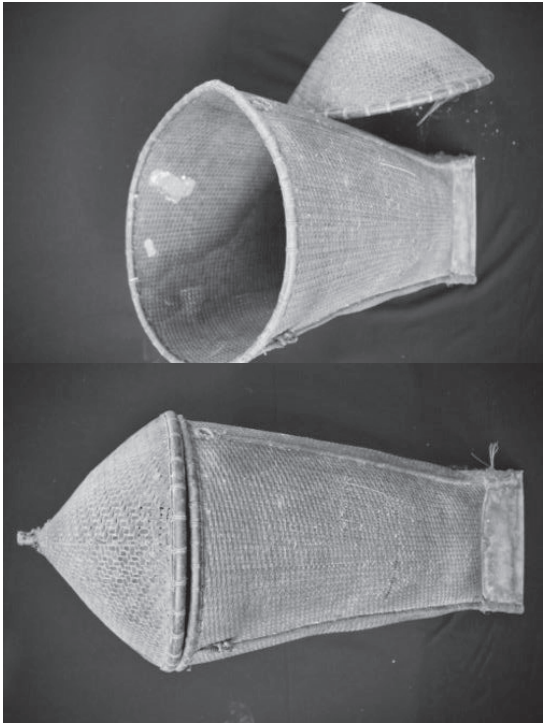
Vietnamese name	Bahnar name	Description and uses	Images
<i>gùi</i>	<i>Hro</i> / <i>Jop</i>	Backpack basket with an open top – tall and big – with the general purpose of carrying things. Made of two types of bamboo, rat-tan (<i>hre</i>), and wood. Bahnar people use <i>hro</i> for transporting water from the well. They pour the water into dried gourds – calabash (<i>to lóp</i>) – and put many <i>to lóp</i> full of water into the <i>hro</i> to carry home.	

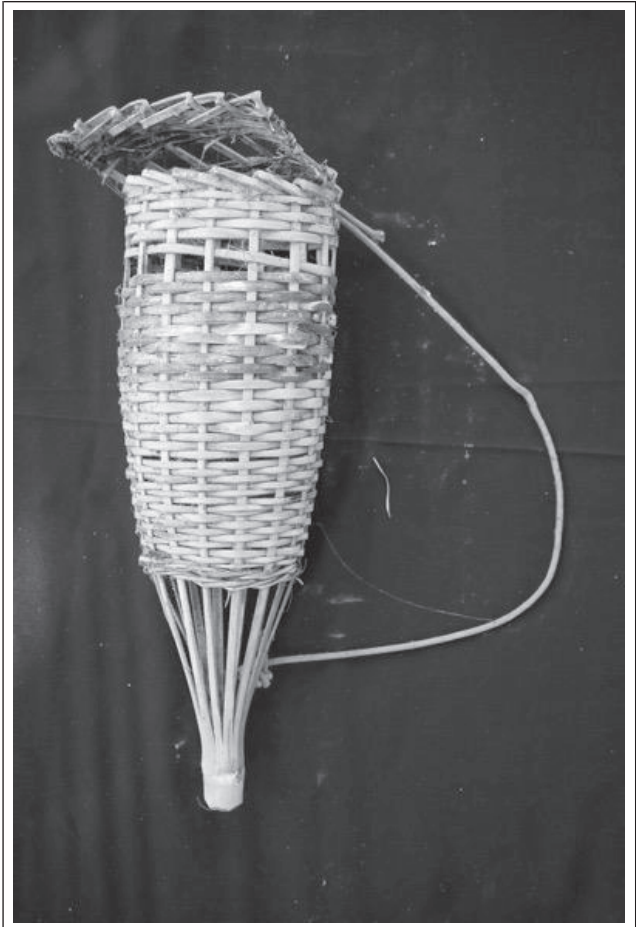
<i>gùì</i>	<i>Xo Kà to hla</i>	<p>Backpack basket with an open top – tall and big – tightly woven. Used to carry things to the rice paddy, can also be used to carry food (wrapped in leaves) when entering the jungle.</p>	
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<i>gui</i>	<i>Reo</i>	<p>Backpack basket with an open top – small or medium size – tightly woven. Used mainly by women for harvesting vegetables in the jungle. A larger version is used to hold greater quantities of vegetables.</p>	
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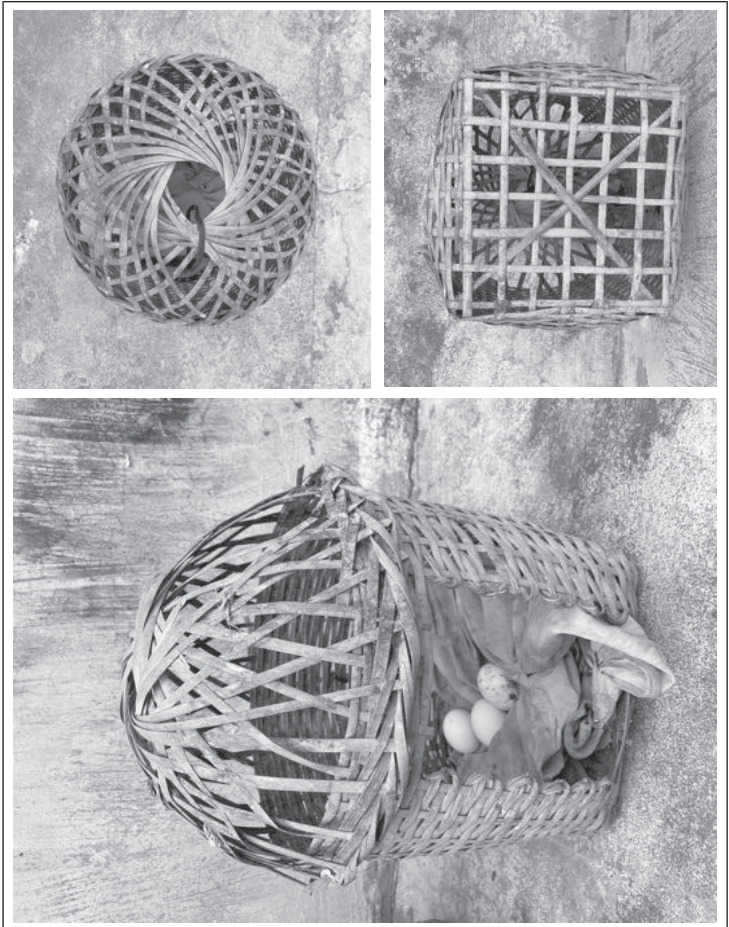
<i>gũi</i>	<i>Króih</i>	<p>Backpack basket with a closed top, so that the contents are hidden from view. Used only by men, its functionality is to carry animals (killed beforehand) and is made specially to hide the contents from view.</p>	
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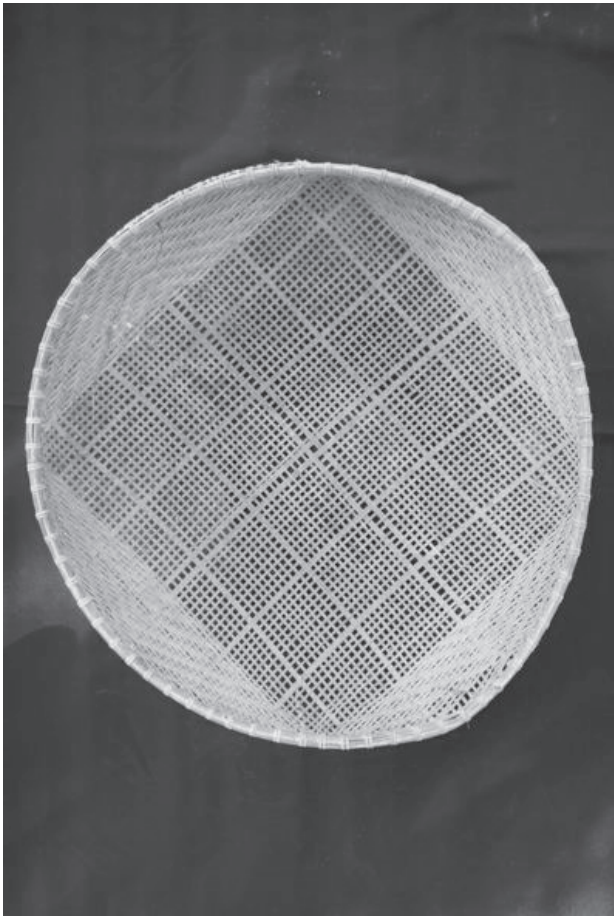
<i>gũi</i>	<i>Xo kã</i>	<div>Backpack basket designed to lie flat against the body, used for hunting trips.</div>	
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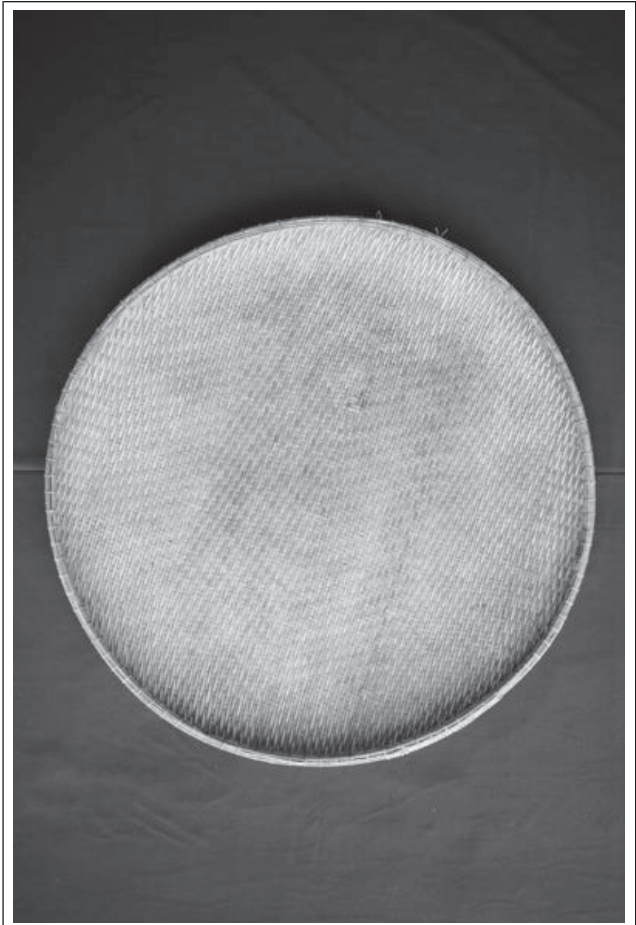
<i>gùi</i>	<i>Hjác</i>	Backpack basket similar to <i>xơ kã tơ hla</i> , but in a larger size, with more detailed weave pattern and decorations, and with a cover (<i>kor nel</i>). Used indoors, to store family goods such as clothes.	<p>The authors could not find a <i>hjác</i> in the village to photograph. The last known exemplar in Kon Ktu belongs to Mẹ Bum's family. However, some years ago, the Christian nuns (who have a close relationship with the community and Mẹ Bum's family) borrowed the basket for a church cultural exhibit in Ho Chi Minh City. They have not yet returned the basket. This story illustrates how a beautiful and detailed-decorated Bahnar backpack basket disappeared recently.</p>
<i>gùi</i>	<i>H'kã</i>	Similar to the <i>hjác</i> , used to keep harvested rice at home, and bring food to the rice field for a working day.	



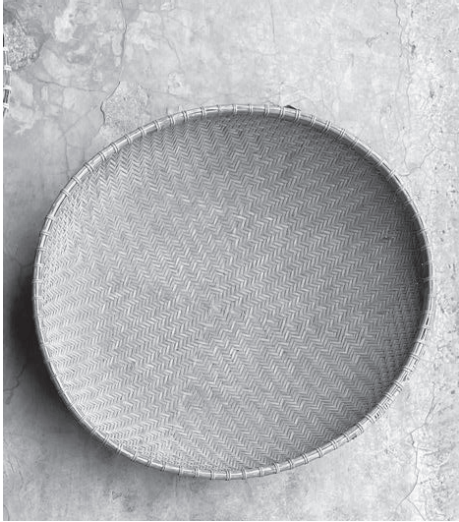
<i>gió</i>	<i>Tơ rốp</i>	<p>A small basket used to carry a wild chicken caught in the forest. This basket has openings so that everyone can see and acknowledge that you have caught a wild chicken.</p>
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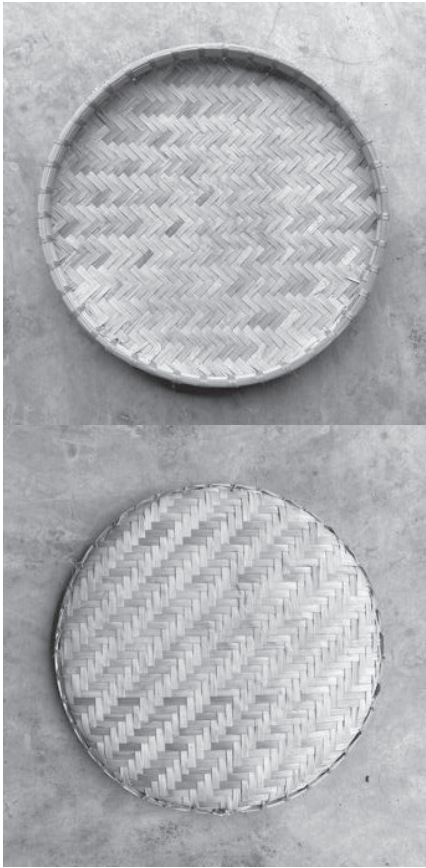
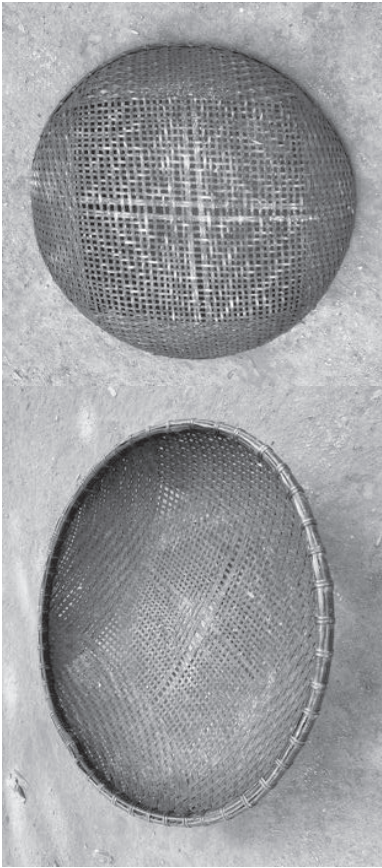
<i>lông gà</i>	<i>Tơ drung</i>	A large basket to hold (a) domestic chicken(s).
		

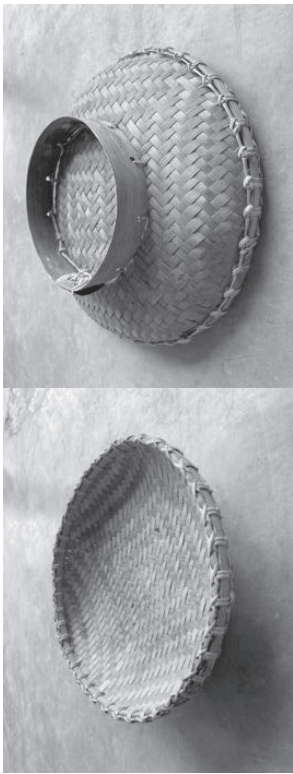
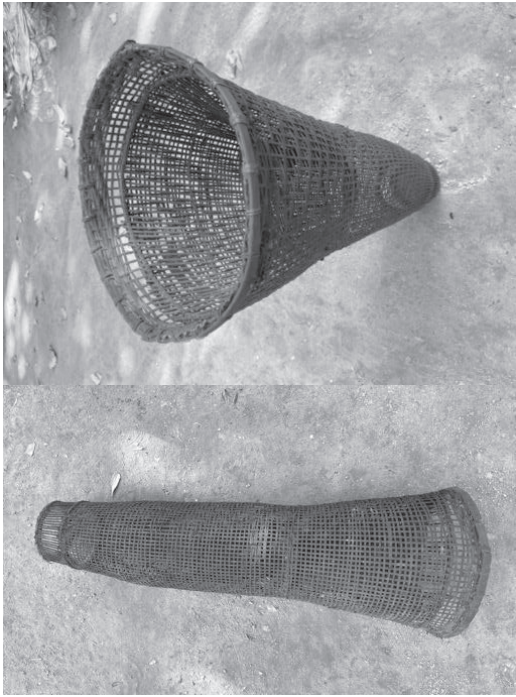
<i>dân</i>	<i>Glang brêu</i>	<div></div> <p>Rice winnowing basket, mainly used by women.</p>
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sàng	Cơ dùm	Rice sifting basket – large size.
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<i>nong (dụng gạo)</i>	<i>Cơ dũm pung</i>	Basket for containing rice – large size with the depth to contain screened rice.	 
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<i>sàng</i>	<i>Cơ đồng zé</i>	Rice sifting basket – smaller size.	
<i>xúc (bắt cá)</i> (catch fish)	<i>Glang</i>	Sifting basket – smaller size – to catch river fish and shrimp.	

<i>Rú (dụng com và đồ ăn)</i>	<i>Cơ đồng</i>	Basket with depth, of small size, and a wooden base-stand attached; Bahnar used <i>cơ đồng</i> to politely offer guests a meal.	
<i>lờ (bắt cá)</i> (catch fish)	<i>Pam</i>	Fish trap basket.	

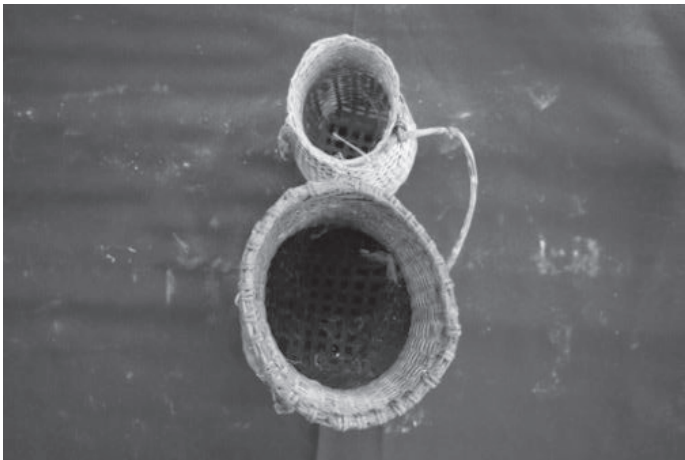
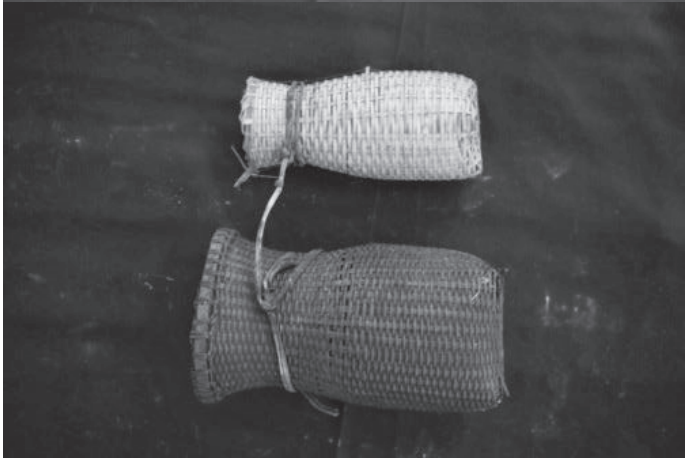
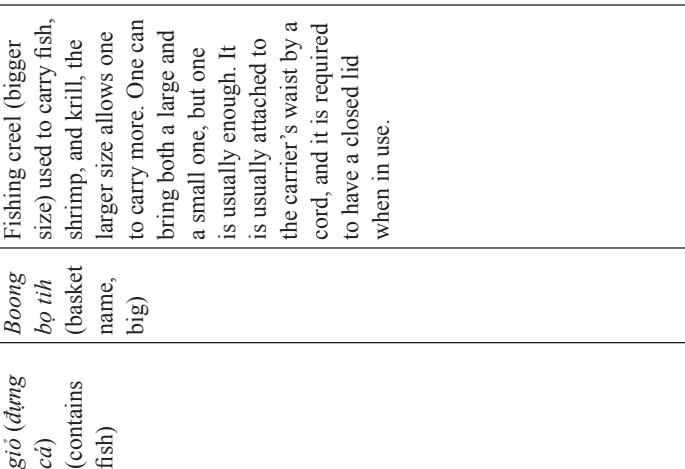
<i>gió (đựng cá)</i> (contains fish)	<i>Boong bọ tih</i> (basket name, big)	<p>Fishing creel (bigger size) used to carry fish, shrimp, and krill, the larger size allows one to carry more. One can bring both a large and a small one, but one is usually enough. It is usually attached to the carrier's waist by a cord, and it is required to have a closed lid when in use.</p>	 	
<i>gió (đựng cá)</i> (contains fish)	<i>Boong bọ ye</i> (basket name, small)	<p>Fishing creel (smaller size).</p>		

Table 2. Bahnar basket terms from the Plei Bong-Mang Yang dialect (Banker, Banker and Mör, 1979).

<i>ată̄r</i>	basket strap
<i>bai</i>	small bamboo basket
<i>biông</i>	large basket, used for measuring rice
<i>brong</i>	type of basket carried on back
<i>brông</i>	basket with decorative layer
<i>búng</i>	type of basket
<i>đūt</i>	a basket to be broken
<i>grang</i>	a basket used to catch fish
<i>jak</i>	small back basket
<i>kiễ̄l</i>	bottom of basket
<i>kođum</i>	large, shallow basket or tray used to winnow rice
<i>krôh</i>	backpack basket with the opening on the side, rather than at the top, used to carry belongings
<i>nôt</i>	basket with small neck
<i>reo</i>	small backpack basket
<i>sêng</i>	large drying basket
<i>sokă̄</i>	a small backpack basket
<i>todrôp</i>	market basket, cage basket
<i>yôu</i>	for catching fish with a basket



Figure 2. (Left) Mệ Náy using winnowing basket; (right) A Bên discussing *Boong bọ* baskets with Trần Hoài. (Photos by K. David Harrison).



Figure 3. (Left) A Bum weaving a fishbone pattern and decorations; (center, right) for *gang* ritual column. (Photos by Đỗ Trường Huy, Trần Hoài, Đỗ Trường Huy).



Figure 4. (Left) A Hung making a *Reo* basket; (right) Bahnar children carrying beautiful *Reo* baskets filled with flowers in a cultural performance in Kon K'tu Village. (Photos by Trần Hoài).



Figure 5. (Top left) A Banh family's *Reo* basket, full of stored rice grains along with a ritual leaf *Hla to say* for the new crop seeding ritual (top right). A Banh transferring

rice grains to the *Reo* basket to conduct the seeding ritual (bottom left). A Banh praying in front of a cross (made from bamboo) in his family's rice field. A basket of new crop grains is behind him; (bottom right) A Banh sowing rice grains in the field after the ritual. (Photos by Trần Hoài).



Figure 6. Mệ Bun demonstrating the combined use of *Cổ đum* (in her hands) for sifting rice and *Cổ đum pung* (on the ground) to contain the sifted rice. (Photo by Trần Hoài).

The relational plant: *Spiraea Söösken* among the Tyva Pastoralists

Victoria Soyán Peemot

Abstract

This paper explores Indigenous knowledge about plants among nomadic pastoralists in the Tyva Republic, North Asia. It focuses on the *Rosaceae* family's genus *Spiraea* which is represented by several species in Tyva and corresponds with the taxon *söösken* in the folk nomenclature. The study reveals factors that inform the Tyva pastoralists' relationship with *söösken*, its uses for different purposes, and challenges in correlation of the folk taxon *söösken* with different genera and species in linguistic and ethnographic sources. This paper investigates how the pastoralists' understandings of *söösken* are embedded in their relationship with sentient and superordinate homelands.

Keywords: Tyva Republic, ethnobotany, multispecies studies, environmental linguistics, *spiraea*

1 Introduction

Doing field research in the transboundary region between the Altai and Saian Mountains in North Asia from 2015 to 2022, I encountered local peoples' knowledge about various plants on multiple occasions. My interlocutors – nomadic pastoralists and hunters – talked about plants as food for people and domesticated and wild animals, as a fermentation agent for mare milk, as medicine for people and livestock, as material for crafting a yurt, horse tack, and

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smoking pipes. Some plants had a special status which implied respect for them and regulation of the ways to harvest and use them. These plants are understood as participating in the relationship between the human-nonhuman communities and sentient landscapes.

In this study, I investigate the Tyva pastoralists' understanding of plants as respected beings that communicate between sentient superordinate homelands and human-nonhuman communities. I focus on genus *Spiraea* known in the Tyvan language as *söösken* [Tyv. сөөккен].¹ First, I discuss research methodology and ontological standpoints that allow for the sociality of landscapes and various nonhumans, including plants, among the Tyva people. Next, I focus on the correlations between folk taxonomy and scientific identification of *Spiraea* and on the genus' names in the Turkic languages. Third, I proceed to a discussion about the Tyva pastoralists' relationship with *söösken*, its status, and its use.

2 Research methodology and field sites

I discuss these two topics – research methodology and field sites – in one section because they equally inform each other in my work with pastoralist communities in the Altai and Saian Mountain region of North Asia. In this section, I draw attention to relational epistemology of Indigenous knowledge about plants. I am a Tyva scholar, and I have been conducting fieldwork with (kin) communities in my home region since 2015. My mother tongue is Tyvan. While doing research in different parts of the Tyva Republic (the Russian Federation) and Mongolia, I became aware of linguistic differences between the Tyvan speakers in the vast transboundary region that stretches between the Altai and Saian Mountains. Being a native speaker of the southern Tyvan dialect, a lexicon of which has been impacted by the Mongolian language (Bavuu-Surun, 2018: 211–212), was helpful in research in southeastern Tyva and in the Bayan-Ölgiy and Khövsgöl provinces of Mongolia. I was more aware of linguistic differences while working in other locations, for instance, the Övür and Mөngүн-Taiga provinces in western Tyva. My gender and belonging with the landscapes of my kinship group add to the factors that impact my knowledge and research methodology.

I previously studied the relationship of horsemen, horses, and landscapes among my paternal Soyan kinship group in the Tes-Xem köžuun (province), which stretches between the Taңdī-Uula Mountains and the Nařın River on the border with Mongolia (see Figure 1). From their winter grounds south of the Tes River, the Soyan herders move to seasonal pastures in different locations. Some families make transhumance in the northern direction, to the boreal forests of

the Tanđi-Uula Mountain range. Others spend several months – from April to November – in the arid steppe surrounding the saltwater Lake Šara-Nuur in the southern borderland.



Figure 1. The view from the Tanđi-Uula Mountains southwards to the Uvs Lake Basin, June 2018. (Photo by Victoria Soyan Peemot).

Šara-Nuur was the place where my paternal grandparents used to live. My emic experiences with the plants and observations on how people engage with them are enabled, defined, and limited by my belonging to southern Tyva and its steppe ecology. Local communities use numerous herbs as medicines, including *it-kadi* (*Rosa majalis*), *artiš* (*Juniperus pseudosabina*), *čigir-sigen* (*Glycyrrhiza soongorica*), *čoduraa* (*Prunus padus*), *agi* (*Artemisia frigida*), *ulug-oʔt* (*Rhodiola rosea*), *šejne* (*Paeonia anomala*), *börü oʔdu* (*Gentiana macrophylla*), and *čžirgana* (*Hippophae rhamnoides*). These plants are gathered locally in the Tanđi-Uula Mountains, the Tes River valley, and in the steppe areas. Some of them are used as food too. My grandmothers actively used the listed plants for medicinal purposes. On June 18, 2019, I made notes listening to my grandmother Kadip-ool Irisinmaa Norbuevna (1930–2023) when she talked about edible and medicinal plants (personal conversation, Tes-Xem, Tyva).

Revising my notes later, I noticed that grandmother's knowledge of plants was packaged together with information on the species' whereabouts and a gathering period. In addition, she included stories about people from our kinship group who gathered edible and medicinal plants or lived in the above-mentioned

landscapes. The means of packaging information, which includes the description of a plant, its areal and life circle, geographies and temporalities of human-plant interactions, emerges from the 'practical engagement with landscapes' (Brandišauskas, 2011: 128).

This interdependence of one's homeland and knowledge about plants accords with Sabira Ståhlberg and Ingvar Svanberg's approach to ethnobiology as research that 'deals with human knowledge about and relationship with other organisms in a specific environment' (2021: 17). They noticed further that

[l]ocal knowledge about the environment and its biota (all organisms within a certain habitat) is an ethnobiological concept which comprises widely diverse subjects such as folklore, folk remedies, linguistic expressions, utilisation of other organisms, and also how these organisms are affected by human behaviour and management. (ibid.)

My use of the expression 'packaging information' comes from the work of the linguist and anthropologist K. David Harrison, who is the coeditor of this issue. He writes about the Indigenous languages:

What these languages do [...] is much more than simply naming the menagerie, calling 'lion' and 'tiger' by their names. They afford strategies of packaging information, organizing it into hierarchies, and embedding it within names. The longer a particular people have inhabited and made use of an ecological niche and practiced a particular lifeway, the more likely they will have applied their linguistic genius to describing that ecosystem. (Harrison, 2007:24–25)

During fieldwork in the Tyva Republic from 2015 to 2019 and in Mongolia in 2016, 2022, and 2023, I made audiovisual recordings of semi-structured interviews with herders and their practices. In addition, I rely on ethnographic sources which studied pastoralist communities in central and northern Asia (e.g. Potapov, 1969; Vainshtein, 1991; Turčaninov, 2009). The study of ethnographic collections in different museums has also revealed the significance of *söösken* for the Tyvan-speaking communities. I had access to the Tyvan collection in the Museum of Cultural History of the University of Oslo during research visits in 2022 and 2023. This collection had been brought by the Norwegian explorer Ørjan Olsen from Tyva in 1914, and among its more than hundred items were, for instance, smoking pipes crafted with *söösken*.²

3 The theoretical framework: Living in sentient homelands

The relationship of the Tyva pastoralists with their homelands and nonhumans (animals and plants) is informed by relational ontology where, as anthropologist Morten Pedersen emphasizes, 'the social is not confined to the domain

of human beings' (2001:413). Distinguishing between animism and totemism in North Asia, Pedersen classifies Tyva as part of Northern North Asia along with Indigenous peoples in northeastern Siberia and the Far East (the Russian Federation). He emphasizes that 'the North Asia social realm is made up by both human and nonhuman beings' (Pedersen, 2001: 414). In this human-nonhuman social realm, homelands are understood as sentient (Anderson, 2000) and superordinate in relation to inhabiting them multispecies communities (Humphrey, 1995; Humphrey and Onon, 2003 [1996]). Caroline Humphrey noticed how the Mongolian pastoralists, in their interactions with landscapes, acknowledge their superiority (1995: 135).

Likewise, the Tyva pastoralists engage in reciprocal relationships with homelands approaching them as powerful and superior; Humphrey, Monguš and Telengid define this approach to the environment in Tyva and Mongolia as 'an interactive system' (1993). In her book *Ethnoecology of Tyva*, Liliia Arakčaa observed that the Tyva people considered all beings as 'living and breathing'; when interacting with nature, people acknowledged its superiority and positioned themselves as 'a younger partner'; they believed that harming nature is harming themselves because 'people are part of nature' (2015: 137). The Tyva people personify a landscape as a sentient nonhuman, nonanimal being – a master of the land (*čer eezi*). *Eezi* is the third-person possessive form of the singular noun *ee*, which means 'owner' or 'master'. Plural forms are *eeler*, 'masters', and *eeleri*, 'masters of something'. Humphrey and Onon argued that the concept of 'master' (Mong., *ejin*) has allowed people to approach landscapes as sentient beings with whom they engage in relationships and who grant things to people (2003 [1996]: 85).

Elsewhere, I have discussed the Tyva pastoralists' relationship with their homelands and customary regulations of this relationship that take into consideration the sentience and superiority of landscapes. I noticed a belief that violation of these regulations results in retaliation from the superordinate landscapes (Peemot, 2024: 8–19). I defined the multispecies relation to home landscapes, as land-based human-nonhuman kinship. In this kinship, nonhumans (landscapes, animals, and plants) are either in a superordinate position (landscapes) or mediate between landscapes and multispecies communities (animals and plants). I will discuss the plants' capacity as mediators more in the following section.

4 Plants in multispecies community-homeland kinship

Previously, I argued that pastoralist communities are engaged in the reciprocal relationship with their homelands. These relationships are understood as

continuous across multiple generations and extend beyond the individual. I suggest that the practice of a newborn child's first bathing aims to initiate and strengthen the child's relationship to his or her homeland. Here, I describe the practice based on my emic experience.

I have observed multiple times how my grandmother Kadip-ool Irisiṇmaa Norbuevna prepared a bath and 'washed' her grandchildren and great-grandchildren. I have not encountered any description of an analogous practice in ethnographies of Tyva. The practice does not have a specific name and is called *čaš urugnu čuuru* [Тыв. чаш уругну чууру] which is translated as 'washing (or bathing) a baby'. As the name suggests, it is performed soon after a child is born and must, preferably, be his or her first bath. Bath water includes several ingredients: a concoction of the juniper *artiš* (*Juniperus pseudosabina*), mutton broth, and the ground mountain salt known as *kizil dus* in Tyvan. These ingredients represent the homelands and pastoralist ways of life. The juniper, which is used by Ak-Erik Soyans, grows in the Taṇdī-Uula Mountains; a concoction made with the herb is taken internally as a flu medicine; its smoke is used for purification in everyday life and as part of religious rituals. The salt comes from Dus-Dag Mountain, which is situated in the western Taṇdī-Uula Mountains; it is the only deposit of the mountain salt in Tyva. There is a noticeable injunction against using lake salt, which is usually abundant in local households because it is collected from Lake Dus-Xöl in southern Tyva. Meat for the broth comes from a sheep that was slaughtered specifically to feed a mother after giving birth and help her to recover.³ A closely related elder woman prepares and thoroughly 'washes' a baby in this mixture; no shampoo or soap is used. My grandmother explained that this bath 'protects the child', but she did not specify against what it is supposed to protect.

I suggest the following understanding of the practice. First, the ingredients of the bath – the juniper, salt, and mutton broth – represent the homeland, the Taṇdī-Uula Mountains (it is also the most powerful sentient nonhuman in the area), and a herding life. Second, bathing in the mixture gives the child the tastes and smells of homeland, exposing him or her to sentient landscapes and allows for the child to be recognized as a part of a land-based human-nonhuman kinship. Its customary regulations require a respectful approach to the plants. There is a general prohibition on cutting any plant without a good reason; the justifiable reason could be its use as medicine, food, or a material for crafts. Disrespect toward plants is understood as an offence toward sentient homelands to which plants belong, along with more-than-human communities, including the person gathering the plants. This may bring negative consequences for the health and well-being of a person and his or her family and community. Before

taking a plant, a gatherer asks the masters of the homeland to give the plant for a good purpose and brings offerings: dairy, sweets, and ritual ribbons *čalama*. I will discuss examples concerning *sööskən* from my fieldwork below. But first, I will briefly introduce the plant and discuss *Spiraeas* in the other Turkic and Mongolian languages as well as its varying translation in the ethnographic literature in Russian.

5 The plant's name and its translation

Studies on the flora of Tyva mention six species of *Spiraea*: *S. alpina*, *S. chamaedryfolia*, *S. flexuosa*, *S. hypericifolia*, *S. media*, and *S. salicifolia* (Monguš, 2011; Ooržak and Dubrovskiy, 2013; Makunina, 2020; Samdan, 2021).⁴ The genus *Spiraea* corresponds with the taxon *sööskən* in the Tyvan folk nomenclature. The Tyva religious practitioner and author Stanislav Serenot referred to all *spiraeas* as *sööskən* and noted that flowering branches of three species – *S. media*, *S. hypericifolia*, and *S. salicifolia* – are used in traditional medicine (Serenot, 2009: 152). Serenot gives the genus' name in Tyvan: *sööskən*. For the species, he provides the calque translation of scientific names: *S. media* – *ortumak sööskən* [Tyv. ортумак сөөскөн], *S. salicifolia* – *xaak бүрүлүг* [Tyv. хаак бүрүлүг сөөскөн], and *S. hypericifolia* – *zveroboi бүрүлүг sööskən* [Tyv. зверобой бүрүлүг сөөскөн].⁵

According to horseman Roman Soyanovič Aldin-Xerel, b. 1959, who is knowledgeable about the steppe and taiga ecologies in southern Tyva, there are three types of *sööskən*: *kodur-sööskən* (*S. alpina*), *kizil-sööskən* (*S. hypericifolia*), and *agižak-sööskən* (*S. media*?).⁶ Consider, for instance, how he describes *Spiraea alpina*, ‘There is *kodur-sööskən*: it is small, and its bark peels off. Hence, its name is *kodur* [skin rash] *sööskən*’ (video conversation with Roman Soyanovič Aldin-Xerel on social media, November 25, 2022). This corresponds to the scientific description of *S. alpina* as a shrub 50–80 centimeters tall with flaking bark.

Next, Roman Aldin-Xerel described *S. hypericifolia*, ‘There is red *sööskən*, tall and neat looking. To make a horse whip, a *kimči*, you must cut this *sööskən*, which is called *kimči-sööskən*’. The third species which he described was *agižak-sööskən*, ‘It is smallish and thin, multiple stems grow from the root. It is used to make the smoking pipe, *dangza*. The pipe must have a knob on one end, so you look for a suitable stem, and pull it out carefully. It is not cut; it is pulled out’. I will return to the ways of using *sööskən* in the next section; here I will continue the linguistic observations.

The Tyvan *söösken* is translated as *tavolga* [Rus. таволга] in the Russian language (Serenot, 2009: 152). The Tyvan-Russian dictionary translates *söösken* as *tavolga* (*Spiraea*) and cites, as an example of its use, *söösken dangza* [Тыв. сөөскен данза] which is ‘a smoking pipe made with spiraea’ (Tenishev, 1968: 387). The Soyot language contains a similar noun, *söösken*, with a synonym, *söbiskén* or *söviskén* [Soyot. сөбискэн~сөвискэн] which also means *tavolga* in Russian (Rassadin, 2003: 129).⁷

The word *tavolga* comes from Old Turkic: *tabilqu* / *tavilqu* (Nadelyaev, Nasilov, Tenishev, and Tšerbak, 1969: 526, 542). In the dictionary of Old Turkic loanwords in the Russian language, *tavolga* is defined as ‘tavoložnik, a shrub of the *Rosaceae* family, *Spiraea*’ (Šipova, 1976). The word corresponds with *spiraea* in other Turkic languages, such as the Kyrgyz and Kazakh languages.⁸

Despite the clear translation of *söösken* as *spiraea* in dictionaries, the ethnographic sources give varying translations of the folk taxon in Russian. For instance, Vainshtein (1972: 143; 1991: 213), describing a Tyvan horse whip (*kimči*), translated *söösken* as *Salix* [Rus. горный тальник].⁹ Potapov mentioned one other local name for *Spiraea*. He wrote that shepherds in southeastern Tyva used different ‘shepherd staffs’ depending on the season: the winter staff was made from a heavy tree – *yargii* [Тыв. яргыы], and the summer one from lighter *burgaas* [Тыв. бургаас] (Potapov, 1969: 95; translation by the author). He translated *yargii* into Russian as *tavoložnik* [Rus. таволожник] and *burgaas* as *tal’nik* [Rus. тальник] which correspond to the *Spiraea* and *Salix* species respectively. In a footnote, Potapov noted that *burgaas* is called *tal* [Тыв. тал] in western Tyva (*ibid.*).

The observed differences in defining *söösken* in the Soyot language as *Spiraea* and *Salix* in different dictionaries (Rassadin, 1971: 228; Rassadin, 2003: 129) may be a result of misidentification of the plants based on the color of their bark and stem. Beneath the gray bark of *Spiraeas* is a dark red stem. Meanwhile, the shoots of some *Salix* species have a dark red or purple color. This led, perhaps, to mistaking *Salix* as ‘a shrub with the red stem’. There is also a difference in the qualities of *Salix* and *Spiraea* as crafting material. The former is appreciated for its flexibility and light weight, the latter – for its strength; some dictionary entries specifically point at the *Spiraea*’s strength (Kenesbaev, 1961: 355; Yudaxin, 1965: 686).

Mongolian has also borrowed the Old Turkic *tabilqu*. The Mongolian-English Dictionary has an entry ‘TABILGU / тавилга – n. meadowsweet, spiraea (plant)’ (Lessing, 1995 [1960]: 761). Studies of the Mongolian-speaking herders in Inner Mongolia revealed another name for *Spiraea*: *sheeber*, which corresponds to the

species *Spiraea pubescens* Turcz. (Soyolt, Yongping, Guohow, and Khasbagan, 2013). On October 10, 2022, I found some twigs, which I identified as *sööskén*, in the store just outside the Gandantegchinlen Monastery in Ulaanbaatar. When I asked for the plant's name in Mongolian, the assistant in the store googled it on her phone and told me that it is *ulaan burgaas*. Sometimes spelled as *burgas*, *burgaas* corresponds to the *Salix* genus in Mongolian (Činbat, 2012 [1998]: 92) and it is translated as such in the Tyvan-Mongolian dictionary (Dorlig and Dadar-ool, 1994: 141).¹⁰

In the Tožu-Tyva dialect of the Tyvan language, there is another name for *sööskén*: *sugai* [Tyv. cyрай] which is specified as ‘a kind of *sööskén*’ (Čadamba, 2013: 31).¹¹ It may be borrowed from Mongolian, which has the noun *suhai* [Mong. cyхай] that means ‘tamarisk’ (Činbat, 2012 [1998]: 392). Some studies in folk plant taxonomy also link *suhai* to the genus *Tamarix* (Khasbagan and Soyolt, 2008; Soyolt, Yongping, Guohow and Khasbagan, 2013).

Names for *Spiraea* in the Tyvan and Mongolian languages and their correlation with botanical nomenclature need more thorough research via the participation of the local experts, who are knowledgeable in languages and plants, and botanists. Bavuu-Surun, Shirobokova, and Samdan (2018) discussed names of medicinal plants in the Tyvan language and pointed out that ‘there are many problems with a coherent determination of names of the medicinal plants in the Tyvan language dictionaries’ (2018: 43). The authors drew attention to a lack of names in the translation dictionaries, non-matching names in different sources, inconsistent descriptions leading to mistakes with naming, incorrect names, and problems with identifying the species names versus the genus (*ibid.*).

6 Encounters with *Spiraea* in mountain homelands

The genus *Spiraea* belongs to the *Rosaceae* family. Plants in this genus are known to have various biologically active components that contribute to their antioxidant, antibacterial, anti-inflammatory, and antifungal properties (Kostikova and Petrova, 2021). Phenolic substances, phlobaphenes, in the bark of some spiraeas, cause the dark red color of the plants' periderm – this feature is registered in the folk name of the plant as *kizil sööskén* (Karpova and Imetxenova, 2015).

Spiraeas grow in the mountain taiga and mountain steppe areas (Saxnevič and Zolotuxin, 2018: 36). The genus is well adapted to ultra-continental climate and high altitudes in the Altai and Saian Mountain regions. Consider, for instance, the following observations on *Spiraea*'s high-altitude habitats in two different locations in Tyva by the Finnish geographer Johannes Gabriel Granö

(1909). He didn't provide the specific species' names in this article except for a few plants. The first excerpt from Granö's article was about *Spiraea* in the Bii-Xem River area, the Upper Enisey region:

Far below us we saw the vast valley at the bottom of which Bei-Kem, split into dozens of branches, rolled towards the West, and far in the South Kara-Art has risen as the tall blue wall. On the mountain slopes the familiar plants grew, for example, pine forests the undergrowth of which was formed by lingonberry (*Vaccinium vitis idaea*), twinflower (*Linnaea*), wintergreen (*Pirola*), strong-smelling wild rosemary (*Ledum*) and so on. On the shores of Bei-Kem, there were lush meadows and, in some places, beautiful larch and birch forests. Grass vegetation (*Aconitum*, *Aquilegia*, *Delphinium*, *Spiraea*, *Calamagrostis*, *Agrostis* et cetera) in those marshes were often so tall that the caravan horses were not visible at all. (Granö, 1909: 37; the river's name is given as in the original; my translation from Finnish)

Further, Granö described the western Tañdī-Uula Mountains, which he crossed before descending to the Lake Uvs basin:

The horse path first follows Dzenagash, then Dzhedan, further east up the river Köndergei, which joins the Kemchik, and to the Tannu-Ola's high ridges. This mountain range is not as humid, dark, and covered with the impenetrable forests as the Sayan Mountains. The horse path sometimes passes through beautiful meadows, sometimes through the bright larch forests. The genera *Populus*, *Salix* and *Spiraea* can be found on the streams' banks. (Granö, 1909: 47; Toponyms are given as in the original; my translation from Finnish)

In mid-June 2018, I hiked up the Xayalyg-Semis-Tey, the southeastern spur of the Tañdī-Uula Mountain range in my home province of Tes-Xem in Tyva. Robert Beahrs and Arapčay Soyan, the 15-year-old son of our hosts and my long-time acquaintances Aylaṇmaa and Nogaan-ool Soyan accompanied me (see Figure 2).¹² Arapčay's parents belong to my paternal kinship group, the Soyans, who make up the majority of population in the Kīzil-Čīraa municipality with its only village Ak-Erik.¹³

Our route half-circled the hill, avoiding its steep eastern side. Arapčay stopped from time to time to make comments about different locations we were passing. Pointing to the hill we had left well below us, he said, 'This one is the Xaraa-Tey, Lookout Hill. We go up there to see where the livestock is'. Soon Arapčay stopped on the ridge and pointed to the rocky place at the mountain side, 'The vultures ate a nanny goat with her newborn kid two days ago there. They must have targeted the goat when she left the flock. Around 30 vultures were circling above this spot, so it was easy to find what little was left of the goat and its kid'. While ascending, we discussed a research paper that Arapčay wrote for school last autumn. The paper was about making Tyvan whips with *söösken*,

and his work won first prize in a contest among students in Kyzyl, the capital of the Tyva Republic. He later presented the same paper at the conference in Irkutsk, a town in eastern Siberia.

Arapčay attracted our attention to the thicket of shrubs with white flowers: ‘Here *sööskən* and *irgay* grow together. Both of them are used for making horse whips’.¹⁴ When I asked Arapčay if this is the location where he cuts *sööskən* for his whips, he answered, ‘My father cuts the *sööskən*. I do not know where he cuts’.¹⁵ Nevertheless, his father had instructed him on how to cut *sööskən*. Taking a self-reflexive approach to my past experience with making horse tack, I acknowledge that the gender distinction has limited my knowledge of *sööskən*. Although, as a teenager, I regularly helped my grandfather when he was occupied with this task, I have never made a complete item of horse tack on my own nor learned how to identify and cut *sööskən* for a whip. Because of the gendered approach to crafts and horsemanship, Arapčay – as a boy – has been helped explicitly by his father to acquire the necessary skills.



Figure 2. Arapčay Soyán is saddling his horse at the summer encampment, Tanđı-Uula Mountains, Tyva 2018. (Photo by Victoria Soyán Peemot).

Arapčay said this:

First, one has to pull some hair from the tail of the horse he is riding and tie it on the tree. It is like asking [for permission to cut *sööskən*] from the Oran-Tanđı. A person has to cut a piece of *sööskən* that is of a suitable size for him. The right length is measured by holding the stem with one hand and placing

the other hand on top of it while reciting, ‘Where do you go? I am going up the mountain ridge. What are you going to do? I am going to cut the handle for the whip. One for me, one for you’.¹⁶

In the way that Arapčay placed his palms on each other, one palm was equal to four *ilig* or fingers.¹⁷ He did it six times while stating, ‘My father tells that only this much is used. Whips of all people are of this length. Well, it depends on the person’s palm, older sister’.¹⁸ On the top of the mountain, Arapčay has pointed to the much smaller shrub and noticed that this one too was a type of *sööskən*.

The first species we found on the slope was *Spiraea hypericifolia* L. (see Figure 3). It had small white flowers on some branches. Some of its oblong-elliptical leaves were smooth-edged and some had a few teeth. The thin branches had a dark red color while the thicker ones were covered with the grey bark. The second plant, growing on the rocky summit, was *Spiraea alpina* Pall (see Figure 4). It was a small, compact shrub with white flowers gathered into thick umbrellas. Its intensely peeling bark revealed a dark red stem. *S. hypericifolia* is a xerophyte and *S. alpina* is psychrophite; thus, both are well adapted to the high altitudes and ultra-continental climate in their habitat (Ooržak and Dubrovskiy, 2013: 64).



Figure 3. Sööskən *Spiraea hypericifolia*, Tanđi-Uula Mountains, Tyva, June 2018.
(Photo by Victoria Soyan Peemot).

There are two methods for gathering *sööskən*. In the previous section I quoted Roman Aldın-Xerel as saying that, depending on the purpose – making a whip or a pipe – the plant is either cut or pulled out. Arapčay Soyan also confirmed that *sööskən* to be used for a whip is cut. The Tyva herder from Mongolia, Gosan Kazak-Köyü (b. 1947) told me that they do not cut *sööskən*. Answering my questions about the use of *sööskən* among the Tyva people in the Altai Mountains of Mongolia, the elder explained:

We use *sööskən*. It does not grow here; it grows far away, near the border. It grows near the Chinese-Mongolian border. In this place, *sööskən* and ırgay – there is a tree ırgai, it is very strong – do not grow. *Sööskən* can be found in the far place, knowledgeable people go there and gather it. Especially people from the northern region gather it. They know the place well. We cannot get there; it is too far. We ask those people [for *sööskən*]. We ask for one or two pieces, we do not take much, only a little. When taking it at the place, you pull it out together with the root. Underneath it is a large root, it is round like this. It bends like this, and that bending part is used for a whip. It is a handle of the whip, at its top you braid the leather rope, and make a whip. [When gathering *sööskən*] one cannot do without making offerings and *saŋ*,¹⁹ praying, and attaching white colored [things].²⁰ (Video-recorded interview, winter encampment, in Čeek in the Ak-Xem River valley, Bayan-Ölgiy Province, Mongolia, October 3, 2022)

After explaining how to gather *sööskən* and what kind of precautions one must observe while gathering the plant, he added that the Tyva people do not cut *Larix* [Тув. дьт] and *Salix* [Тув. тал]. If necessary, these trees are cut only after properly ‘asking’, which included offerings.

These stories about *sööskən* from Tyva and Mongolia reveal the key factors that define the relation of the Tyva-speaking pastoralists to the plant:

- * understanding *sööskən* as a respected sentient nonhuman,
- * participation of *sööskən* in the relation between multispecies communities and mountain homelands,
- * policy of limiting (oneself) in the amount of a plant that may be gathered.

7 *Sööskən*: Crafting material and protection

The use of *sööskən* as material for making the Tyvan horse whip, the *kimčī*, is documented in the ethnographic sources (Potapov, 1969: 96; Vainshtein, 1991: 213). The *sööskən* whip is still used widely in Tyva (see Figure 5). I remember the *kimčī* my grandfather, Soyan Kadıp-ool Kunuyaevič (1930–2016), made for me. He asked somebody to bring him *sööskən* from the taiga, the Taŋdī-Uula Mountains, because our summer pastures were in the steppe by saltwater Lake Šara-Nuur where no bushes grow except *Caragana*.



Figure 4. *Sööskən* (*Spiraea alpina*) overlooking the summer encampment with yurts and animal shelters. (Photo by Victoria Soyan Peemot).

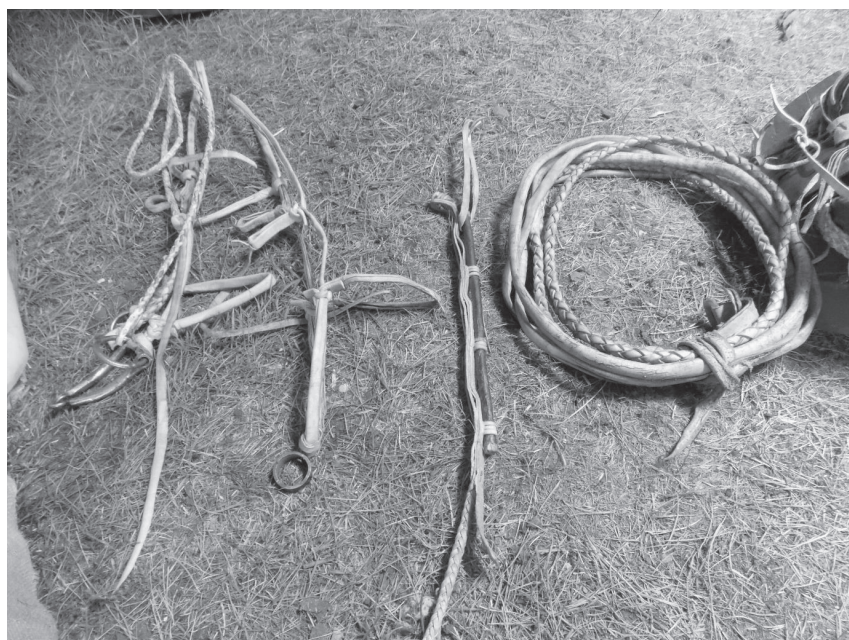


Figure 5. The *kimechi* made with *sööskən*; in Mongolia the plant is pulled out to preserve the knobby part visible in the photograph. (Photo by Victoria Soyan Peemot).

That *kimčī* had a handle, approximately 40 centimeters long, made of *söösken*. There was a hole in the top end for a thin leather rope with a loop so it could hang on one's wrist. On the other end, a well-worked soft leather rope was braided firmly around the handle; with its leather-only part again about 40 centimeters. Like all my grandfather's leather work, the whip was a neat and pretty item. In a yurt, the *kimčī* is placed on the horse tack hanger, the *čagī* [Tyv. чагы] alongside bridles, halters, and a lasso. The *čagī* is located in the western part of the yurt – the space traditionally associated with its male owner (for more on gender distinction in the yurt space, see Peemot, 2019).

The most treasured tack item – a set of the traditional Tyvan saddle, bridles, and halter, as well as items related to the racehorses (awards and special leather-only racing whips) – belong in the most respected space in the yurt, its northwestern side called *dör* [Tyv. дөр]. For instance, in the yurt of Nogaan-ool and Aylaŋmaa Soyan, I noticed the *söösken* whip placed on the 'roof' in their yurt's *dör*. It was placed there along with an iron brand for horses and their son Arapčay's neatly rolled wrestling outfit.²¹ The emplacement of a whip, brand, and a wrestling outfit in the respected part of the yurt corresponds to the high symbolic status of these three things.

Another use of *söösken kimčī* draws from the plant's ability to protect against potentially harmful nonhuman and nonanimal beings referred in Tyvan as *azalar* [Tyv. азалар].²² Ethnographic sources mention the *Spiraea*'s function as 'a safeguard from evil spirits' in Tyvan religious practices (Pimenova, 2017: 156). The Tyvan poetess Lidiia Irgit mentions in her autobiographical essay that, before passing away, her grandfather Kongur Irgit, who was the *xam* (shaman), told to his son, 'After my death I will protect you, I will turn into a black raven to look after you. If you need my help desperately, wave your red whip *kizil kimčī* three times and call out my name three times. You will see that your children will be healthy and well' (Irgit, 2016, translation from Russian by the author). The Tyva *xam* Adigži Oyun told me that he uses a *söösken kimčī* during rituals to chase away harmful beings (private conversation on social media, November 20, 2022)²³. He emphasized that he cannot cut *söösken* himself because he has 'a tree seat' so he asks other people to cut and bring him a piece of *söösken* large enough for one whip, never more.²⁴ My interlocutor noticed that he makes a *xam kimčī* only for his own use. He does not make amulets – small-sized *söösken* whips which the other *xam* make and give as a protective amulet to their clients.

8 Conclusion

In this article, I introduced the Tyva pastoralists' complex understandings of the genus *Spiraea*, which is referred in Tyvan as *sööskən*. *Sööskən* is seen as a sentient and respected plant. The relation to *sööskən* is part of the wider relation to the homeland and follows customary regulations that limit the amount of the harvested plant and define the age and gender of a harvesting person. With help of my interlocutor, the horseman Roman Aldin-Xerel, I was able to point to the Tyvan names for three species: *kodur-sööskən* (*S. alpina*), *kizil-sööskən* (*S. hypericifolia*), and *agžak-sööskən* (*S. media*). Two of these species-specific names, *kodur-sööskən* and *agžak-sööskən*, have not been mentioned previously in the ethnographic or botanical literature. This study has revealed inconsistencies in translating the Tyvan term *sööskən* in ethnographic literature and challenges in identifying the correct corresponding names for the genus and species. More research on the Tyva ethnobotanical knowledge that combines both academic and Indigenous research methodologies is welcome.

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Notes

1. Specific letters of the Tyvan Cyrillic alphabet are transliterated as follows: ө – ö, ү – ü, ң – ŋ, ы – ĭ, й – y, ч – č, ш – š, ж – ž, х – x, and я – ia. Vowels are short, long, or pharyngealized. Pharyngealization is marked by the phonetic sign ʔ as in aʔt [aʔt].
2. The object numbers in the museum's web catalogue and links to the catalogue with photographs: UEM22661, appr. 31 cm long, <https://www.unimus.no/portal/#/things/d5ab4018-bf22-UEM22662>, appr. 29 cm long, <https://www.unimus.no/portal/#/things/f4fa19f4-0558-4a6f->.
3. The following notes help clarify a use for meat: a mother who recently gave birth eats only meat and meat broth; she avoids eating intestines and blood sausages. The back of a sheep – several spinal vertebrae together with the tail – is a dish of honor called *uža*; it is cooked and presented, when possible, to the person who cut a child's umbilical cord. Though currently not mandatory, presenting *uža* is still practiced in the context of birth in maternity hospitals in Tyva.
4. The information about *S. salicifolia* is included here based on the following source: A. Vaganov and A. Shmakov, *Biodiversity of the Altai-Sayan ecoregion*. Altai State University. Doi: <https://doi.org/10.15468/6cvgov>. Accessed via GBIF.org on August 21, 2018 [accessed online November 21, 2022] *S. flexuosa* is observed in the eastern and northeastern provinces of Tere-Xöl and Tožu in the Tyva Republic (ibid., Ooržak and Dubrovskiy, 2013: 64).
5. There is inconsistency in translation here: the author gives the Tyvan name for *Salix* (*xaak*) and the Russian name for *Hypericum* (*zveroboi*) although he identifies the latter plant in the same book in Tyvan as *sekpildig-saryg* [Tyv. секпильдиг-сарыг] (Serenot, 2009:144).
6. He used a Tyvan term *xevir* which means 'type, species, kind'. I put a question mark here because I could not confirm the correlation between the Tyvan name and this species; according to botanical studies, *S. media* is present along with *S. hypericifolia* and *S. alpina*, on the southern slopes of the Eastern Tangdy-Uula Mountains – the area my informant is familiar with (Samdan, 2021).
7. In two other instances, however, *sööskən* is defined in the Soyot language as *Ribes altissimum* [Rus. черная кислица, смородина высочайшая] (Rassadin, 1971:228, Rassadin, 2020: 134).
8. Yudaxin, *The Kirgiz-Russian dictionary*, 1965: 686: “Табылгы таволга, спирея (кустарник с очень крепкой древесиной); табылгдан жаа кылды фольк. из таволги он сделал лук”. Kenesbaev, *The Kazakh etymological dictionary*, V. 2, Қ – Я, 1961: 355: “ТОБЫЛҒЫ зат. Отынға, т.б. шаруашылыққа пайдаланылатын кызыл күрең түсті ағаш тектес өсімдік”. In the Kazakh language, there is a color of horse called ‘the Spiraea bay horse’ [Kaz. тобылғы торы ат] which correlates with ‘blood bay’ in English and *kizil-dorug* in Tyvan equine terminology.
9. In the Tyvan language, however, *Salix* is defined as *tal* [Tyv. тал] which is another Old Turkic word still preserved in multiple Turkic languages with the meaning ‘*Salix*, willow’.
10. The Tyvan name for the *Salix* genus is *tal* [Tyv. тал]; it has an Old Turkic origin and present in other Turkic languages with the same meaning.
11. In the Russian language original, ‘разновидность таволги’ (Čadamba, 2013: 31).

12. I conducted fieldwork together with Robert Beahrs, an ethnomusicologist from Istanbul Technical University, in Tyva and Mongolia from 2015 to 2018.
13. The municipality is named after the willow shrubs that grow in the Tes River valley; *kizil-čiraa* is the Tyvan name for the *Salix* species with a red bark.
14. *İrgay* [Тыв. ыргай] is *Cotoneaster melanocarpus*. This species often share its habitat with *S. hypericifolia* and *S. media* in Tyva (Samdan, 2021).
15. Translated from the Tyvan language, ‘Сөөскенни ачам кезер диин, мен билбес мен кайыын’.
16. Translated from the Tyvan language, ‘Эгезинде мунуп чораан аъдынын кудуруундан баглап алгаш, оран-таңдыдан дилеп аар дээн ышкаш. Кымчының узунун шилип аар даан, угбай. Кай баарың? Сын үнейн. Чүү канчаарың? Кымчы сывы кезип алайн. Меңээ бирээ, сенээ бирээ’.
17. *Ilig* is the Tyvan measurement unit equal to the width of a finger. It is similar to ‘digit’ in English.
18. Translated from the Tyvan language, ‘Чүглө ол хирени хереглээр боор дээр ачам. Бо хире боор. Шупту кижилернин кымчызы бо хире боор. Харын, ол кижинин адыжындан хамааржыр-дыр ийин, угбай’.
19. *Saj* is a ritual fire with offerings of food.
20. ‘Сөөскенни ажыглап турар. Мында чок, ыракта, хилиде бар. Кыдат-Моолдун хилизинде үнүп турар. Бо арада сөөскен, ыргай деп – ыргай деп ыаш база бар, ол-даа сөөк быжыг ыаш – ыргай деп ыаш барык чок. Сөөскен ырак бар, ону алыр улустар барып аптар, ылаңгыя соңгу багның улустары алып турар. Ол чер эки билир. Бис аңаа четпес бис, ол ырак. Ол улустан бис сурап алыр. Ийи-бирни сурап алыр, улуг албас, эвээшти алыр. Черден алырда, ону тура соп алыр, тырттып тургаш, дазылындан кады. Ооң алдында улуг дазыл бар, донгулак мындыг. Мындыг ээр чүве турар, ол ээр чүвезин кымчыга ажыглаар, сывы болур. Сывы ол, эң бажынга баг өөрүп, кымчы кылып каар. [Алырынын мурнунда] өргүвейн канчаар, чалбарып, саң-маң салып, ак өң баглап албааза, болбас’. ‘White colored [things]’ refer to the ritual ribbons.
21. The *sodak-šudak* is the outfit for traditional Tyvan wrestling *xüreš*. There is a demand for respectful care of the *sodak-šudak* which requires placing it somewhere high in the yurt. The victor in *xüreš* is the one who causes their opponent to touch the ground with any part of their body other than boot soles. Arapčay has been practicing *xüreš* for several years. Later in July, we filmed him competing in the republic’s championship during the Naadim festival. He was among the 16 strongest out of 128 wrestlers under the age of 18.
22. *Azalar* (sg. *aza*) is a group name for a category of evil beings (Vainshtein, 1991: 240; Simčit, 2010).
23. He said in Tyvan, “Багай чүвелерни ырадыр” (lit. [*söösken*] drives away the bad things).
24. The expression ‘to have a tree seat’ (*čer oluttug* [Тыв. чер олуттуг]) refers to the elements of the eastern 12-year zodiac cycle where each year has an animal sign and an element. Adigži Oyun also used a verb *čalaar* when talking about asking someone to bring *söösken*; *čalaar* is translated as ‘to invite’; it has a respectful connotation in Tyvan and is often used when referring, for instance, to sacred white food (dairy).

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Article

Medicinal herbs, their names and uses among the Tsengel Tyva people in Mongolia

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Abstract

In this short report, we look at how the Tyva people, who live in northwestern Mongolia, in the municipality of Tsengel in Bayan-Ölgiy province (*aimag*), approach medicinal herbs. We focus on the names of plants and their use in traditional practices.

Keywords: Tsengel-Tyva, Mongolia, folk medicine, ethnobotany,
environmental linguistics, Mongolia, multispecies studies

1 Introduction

The Tyva ethnic group inhabits the municipality of Tsengel in Bayan-Ölgiy Province, the municipality of Buyant in Khovd Province, and the municipality of Tsagaannuur in Khövsgöl Province in Mongolia.¹ There is no official and complete information about the total number of the Tyva people in these provinces. The media and academic publications provide different numbers. More than 2,000 Tyva people live in the authors' home in Tsengel in Bayan-Ölgiy, which is located in the northwestern part of Mongolia (Bayarsaikhan, 2003: 112–115).

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The Tsengel Tyva people live in the Altai Mountains, which are rich in wild-life (urial and ibex sheep, marmots, squirrels) and suitable for livestock husbandry (yaks, horses, cows, sheep, goats, camels) (see Figure 1). Their main occupation is livestock husbandry. Thus, they undertake transhumant migration regularly in all seasons. While doing so, they harvest medicinal and edible plants and use them in traditional healing practices and as food. The Tyva people have safeguarded the traditional practices of nomadic peoples of Inner Asia, and their knowledge has been passed down for hundreds of years. They live in a close relation with their homeland and their natural environment and actively used and continue to use the herbs as medicine and food. However, this knowledge is at risk of being forgotten by the young generation, partially due to migration to the cities and changing habits related to food and medicine use.

As botanical sources point out, there are approximately 3,000 species of plants in Mongolia; about 800 to 1,000 of them are used to prepare medicinal remedies (Volodia, Tserenbalžir and Lamžav, 2008). In this report, we focus on the medicinal plants that the Tsengel Tyva people use in folk medicine and belong to multigenerational plant-related knowledge. The Tsengel Tyva people still speak their mother tongue and rely on traditional ecological knowledge that is part of everyday practices and actively transmitted to the younger generations.



Figure 1. Yurts of the Tyva herders at the autumn camping site, municipality of Tsengel, Bayan-Ölgiy, Mongolia, October 2022. (Photo by Victoria Soyan Peemot).

Our research methodology draws on our personal experiences as Tsengel Tyvans and on our continuous fieldwork with elders in our community. We speak both Tyvan and Mongolian. Using unstructured interviews as the research data collection method, we collected oral stories from more than 40 people. The majority of our interlocutors were elderly Tsengel Tyva people. They shared information with us about the species' local names, times, and locations where to gather the plants, and how to use them as medicine or food. In addition, we relied on existing scholarship about medicinal herbs by Mongolian researchers (Lamžav, Doržžantsan, and Tserenbalžir, 1971; Sančir, Žamsran, and Suran, 2003; Volodia, Tserenbalžir and Lamžav, 2008; Namkamiadag, 2013).

2 Background

The Tyva people used to harvest medicinal herbs after praying and making offerings to their homeland's sacred mountains, the land, and bodies of water. These offerings could be 'white' milk food,² and livestock was sometimes promised in exchange for a plant. The amount of plants harvested was limited: people could take only as much as they needed, never more. It was believed that harvesting an excessive amount and inappropriate ways of harvesting could anger the sky and cause a storm (Namkamiadag, 2013). The Tsengel Tyva people practice nomadic pastoralism as livestock herders. Thus, their life depends on their relation to the environment, which is ubiquitously defined as the Land-Sky (Tyv. *Čer-Deer*).³ To avoid the wrath of *Čer-Deer*, the people harvest the plants during the daytime and only on a special day that is suited for this purpose. The plants must not be harvested at night. There are several reasons for the Tsengel Tyva people's respect for the land and other lifeforms, including plants. First, the Tsengel Tyva people live in the westernmost remote region of Mongolia and, due to the distance from the provincial center and the capital city, they must look for local ways to treat disease. Second, the pastoralists, who move from one seasonal pasture to the next throughout the year, depend greatly on the environment and climate. Third, Tsengel Tyva ontology acknowledges the sentiency and agency of different actors, such as the land, mountains, nonhuman animals, and plants. This leads to the key point in the Tsengel Tyva people's understanding of plants as sentient and social beings that represent the homelands (*Čer* or *Čer-Deer*) which are understood as having power over the lives of humans and nonhumans (Peemot, 2024: 41–45).

Medicinal herbs were usually harvested in August and then dried in a dry and cool place. The dried herbs were placed in textile bags hung on the yurt's interior wall in places where the sunlight could not reach. Preserved in this way,

the herbs were digested mostly in the form of liquid remedies. Medicinal herbs are used to treat wounds and chronic diseases, and to increase metabolism. In addition, they are components of paints and perfume. Currently medicinal herbs are widely used in folk medicine.

In 1997, the Mongolian scholars T. Volodia and S. Daariymaa documented 196 medicinal and poisonous plants during field research in the vast area that included Lake Uvs Basin, Xaan Kögey Mountain range, the Tes River valley, and the municipalities of Xargias, Tarialan, Zuungov, Tes, and Ömnögov in Uvs Province; the municipality of Erdeneburen and Tsambagav Mountain in Khovd Province; the Mongolian Altai mountains, and the municipalities of Tolbo-Nuur, Nogoon-Nuur, Sagsay, and Tsengel in Bayan-Ölgiy Province (Volodia, Tserenbalžir, and Lamžav, 2008).

The history of research on medicinal herbs in Mongolia began in 1951. From 1951 to 1967, researchers from Mongolian State University and the department of pharmacology of the Institute of Agriculture traveled more than 45,000 kilometers conducting field investigations (Lamžav, Doržžantsan, and Tserenbalžir, 1971). These research efforts allowed them to identify more than 600 species of medicinal herbs (including more than 140 plants that can be directly applied in medicine), 10 species of mushroom, and more than 40 medicinal substances produced from animal products. Students of Lamžav continued this research in the following decades – from the 1970s to the 2000s. Ulikpan Beket organized a joint expedition with Russian scholars in 2001. They conducted research in the Beš-Bogda (Mong. Tavan Bogd), part of the Mongolian Altai range, and documented other medicinal herbs. In his publications, Beket (2009) describes medicinal herbs that are used in folk medicine and ways of their protection. He mentioned that, during this expedition, they documented 1,401 species which belong to 440 genera of 89 families. Among them, 133 plants were identified as medicinal (Beket, 2009).

3 Selected plants used in folk medicine

Drawing on the above-mentioned scholars' works and on materials we collected during our fieldwork, we identified approximately twenty additional medicinal herbs used by the Tsengel Tyva in their folk medicine. In the next section, we give detailed information on these plants.

We provide the Tyvan, Mongolian, and scientific names for the species. In addition, we provide information on how the Tsengel Tyva people use these plants, their habitat, the harvesting period, and existing customary regulations that define their relations with them.

Aldin-kaynür is from the *Rhodiola rosea* L. (see Figure 2), *Crassulaceae* family; its Mongolian names are *iagaan mügez*, *altan gagnuur*. Part of its Tyvan name, *aldin* means ‘gold’ and points out the color of the flowers. It grows in rocky places in the mountains. It has multiple stems that are thin and 3 to 20 centimeters tall, thick red roots, thick and somewhat watery leaves, and bright yellow flowers. *Aldin-kaynür* blooms in July. In August, its flowers and leaves are harvested and dried in the cool place out of direct sunlight. The Tyva people use it as medicine for broken bones and especially to heal festering wounds. A dried plant is boiled for about 10 to 15 minutes, and the sick person drinks the tincture, or it is applied to wounds, scars, or bruised skin areas. People who suffer from headache and high blood pressure are advised to drink this three times a day regularly. It stabilizes the blood pressure. In addition, *aldin-kaynür* helps in cases of fever, wounds in the lungs and gastrointestinal tract, and when blood vessels become narrow.



Figure 2. *Rhodiola rosea* (multiple yellow flowers) grows among other edible and medicinal plants in the summer pastures of the Tyvan-speaking Tukha people in north-eastern Mongolia, June 2023. (Photo by Victoria Soyán Peemot).

Čödül-čečee is a member of the *Gentiana algida* Pall., *Gentianaceae* family. Its Mongolian names are *tsagaan degd*, and *ölčir degd*. Its Tyvan name consists of words *čödül* (‘cough’) and *čeček* (‘flower.’) It grows on riverbanks, in wet meadows, and in places where birch and aspen grow. It is a plant about 15 to 25 centimeters tall with one to a few straight stems, with gray-green or yellowish

rhombic flowers. It is harvested at the end of July and the beginning of August. It grows in cool and shadowy places. When dried, it is kept in a textile bag away from direct contact with the sun. *Čödül-čečee* is used as a concoction against wet cough with phlegm; one warm bowl is drunk three to four times a day. It also brings down fever. It is also very effective against throat inflammation and redness, and when a person has difficulty speaking.

Kök-čödül-čečee is from the *Gentiana decumbens* L., *Gentianaceae* family. Its Mongolian names are *xevtee degd*, and *xöx degd*. The Tyvan name translates as ‘the blue cough flower’. It grows in the foothills and on riverbanks. Usually, there are large patches of *Gentiana decumbens* growing in one place. It is 8 to 15 centimeters tall, with a green stem, linear-lanceolate leaves and bell-shaped tubular blue flowers with swirls at the tops. In the middle of July, the flower is harvested along with the stem and dried. It is used as to treat a cough; In addition, it is also administered to treat people with hepatitis and gastrointestinal diseases and to stabilize stomach acid levels. It is boiled in water for 10 to 15 minutes. The dosage for hepatitis must be precise; therefore, one must be cautious when taking the *Gentiana decumbens* concoction. People with unstable stomach acid levels take it three times a day.

Beš-adir-kalbī is a member of the *Plantago major* L., *Plantaginaceae* family. Its Mongolian name is *ix tavan salaa*. It grows alongside paths, in places with pebbles on riverbanks, and in willow groves. It is 30 centimeters tall, with five broad and oval-shaped ‘finger’ leaves. The leaves near the root are somewhat round. Two to three plants grow together in one place. Compared to other plants, the *beš-adir-kalbī* flowers early, so it can be harvested already in June. Some people harvest it in August while cutting hay in the same place. If the plant is harvested in August, it is important to collect the fragile leaves carefully and dry them in the shade. People with stomach disorders boil the plant in water for 10 to 15 minutes and drink the mixture before meals. It boosts digestion and appetite.

Öškü-čeergene belongs to the *Ephedra monosperma*, *Ephedraceae* family. Its Mongolian names are *gants ürt zergene* and *iamaan*. It grows in the foothills, in forests, among rocks, on riverbanks, and in sandy places in carpet-like patches. It ranges from 3 to 20 centimeters in height, with hard straight stems. The stems’ tops are curved and the plant is gray-green with red berries. The *Ephedra monosperma* blooms in July and August and is harvested at the same time. It is used as medicine for kidney diseases. The hard stems do not easily damaged and are therefore suitable for long-term preservation. It is boiled for 15 to 20 minutes, and this potion can be taken internally three times a day. When taken in this way, *Ephedra monosperma* helps to stabilize blood pressure in the kidneys, intensifies urination, and aids in subsiding edema. When there

is a problem with regular nose bleeding, *Ephedra monosperma* can be burned in a manner similar to how juniper (*artiš*) is burned and its smoke inhaled; one can also drink the mixture. It is also believed that *čeergerne* boiled in milk gives energy and helps prevent kidney diseases.

Čagar-sigen is a member of the *Urtica cannabina* L., *Urticaceae* family. Its Mongolian name is *olsig xalgay*. This Siberian hemp nettle grows in places with rocks and pebbles, between boulders, in the foothills, on riverbanks, in dry forests, and in the encampments' territories that are rich in organic nutrients. The *čagar-sigen* has thick stems, 70 to 150 centimeters tall, and each branch has four separate leaves. The flowers grow together. It is a perennial plant with stinging hair. The hemp nettle is harvested in July and August while it is blooming. It is cut with scissors with the harvester wearing gloves. The plants are placed in textile bags and left to dry in a cool place. It is then soaked in hot water for about an hour and then given to a person with stomach diseases. A spoonful is taken three to four times a day before meals. In addition, if a person is losing their hair, nettle water is used to wash the hair and prevent hair loss and help it grow. After washing with nettle water, the plant, which was soaked in water previously, can be applied to the hair, and the head is then covered with a hat. After 15 to 20 minutes, the hair is washed with clean water. Small amounts of this nettle tincture gives energy to exhausted people. Pastoralists mix the nettle with hay that they give to their livestock in spring when animals are lacking nutrients after the long winter.

Öškü-sigen is part of the *Saxifraga hirculus* L., *Saxifragaceae* family. It is known in Mongolian as *iamaan serdeg*. It grows in humid forests, on riverbanks, and in rocky places. It has one or several straight stems that have curved long yellowish hair. There are one or two flowers on the stems' tops. A saxifrage begins flowering in June. It is harvested in July and August when it is fully ripe. This medicinal herb is used to make a tincture that is ingested as a treatment for jaundice and high fever. In the case of fever, a sick person drinks a bowl of this hot saxifrage concoction. It brings down the fever immediately and, in addition, helps the jaundice 'get out'.

Vansemerüü belongs to the *Saussurea involucrata* L., *Asteraceae* family. Its Mongolian names are *nömrögt banzdoo* and *vansemerüü*. It grows in a place with enough humidity at high altitudes, on mountain slopes, and on the wind-sheltered side of rocks. It is a perennial plant. Its thick root is as hard as wood. The leaves are close together, their tips are sharp, and they fall off early. The white-yellow flower is concealed by bracts, special translucent leaves which protect it, and its central part is white. *Vansemerüü* is helpful in treating many diseases, including lung diseases, fever, and phlegm in the lungs. It is also used

to contract the uterus in women after they give birth. There are other uses for *vansemerüü* as a medicine. The plant is digested as a type of tincture by itself or mixed in soup. People avoid using the name of this flower which is viewed as a sacred plant. Instead, a respectful euphemism, 'the flower of the sky' is used. Because of its respected status, gathering *vansemerüü* is restricted. If a traveler comes across the flower, it is good to show it respect because this brings good luck and lifts one's spirits for the whole year. Finding the plant is viewed as a promise of a long life. If this plant is needed for treating some disease, the individual gathering it prays to the sun, to the homeland, and the bodies of water, and makes a ritual fire (*saŋ*) with offerings. This is understood as asking permission from sentient homelands. One may gather this plant or its parts that are damaged and broken off by the hooves of passing livestock. It is believed that if a person cuts this plant, another will lose his or her life.

Xuraan-kulak is a member of the *Rumex acetosa* L., *Polygonaceae* family. The Mongolian name is *isgelen xurgan čix*. The sorrel grows on riverbanks and in humid meadows. It is a perennial plant with four somewhat short (18 to 30 centimeters) finger-like, juicy stems. Its leaves are oblong, and its flowers are reddish in color. The Tyva people refer to mild milk alcohol *šime araga*, which is first made in spring as *xuraan-kulak*. They do so because the taste of this beverage is similar to the abundant and bitter juice of the sorrel. The stems can be eaten directly. Sorrel is harvested at the end of July and dried in a shaded place. Its tincture helps treat edema and to intensify urination in people with bladder problems. It is effective as a treatment for burn wounds and lessens scarring of the burnt areas.

Süttüg-sariġ-čėček is part of the *Taraxacum officinale*, *Asteraceae* family. Its Mongolian names are *emiin bagvaaxay* and *süüt tsetseg*. It usually grows in forests, meadows, on riverbanks, and by roadsides. This dandelion has a thick straight stem, multiple roots, and reaches up to 30 centimeters in height. It has multiple flowers, and there is milk-like white sap inside the stems. It is harvested from May to August and dried. About three spoons of dry dandelions are added to half a liter of boiled water, and this potion remains effective for about an hour. It is ingested before meals 3–4 times per day. This method of ingesting is especially helpful for people who suffer from liver and mesentery diseases. Because of its white sap, it is given to women after they give birth to aid lactation. For this purpose, the dandelion is mixed in tea; it is also possible to suck the sap directly from the stem.

Agī belongs to the *Artemisia frigida*, *Asteraceae* family. It is known in Mongolian as *ag'* and *xüytseg šarilž*. It grows in mountainous areas, on steppes, and on riverbanks with pebbles. This plant has greyish stems that are 15 to 30

centimeters tall with silk-like thin tops. Because it is covered by very thin grass, it looks gray and green from afar. *Artemisia frigida* is harvested in mid-July and August. The roots are not extracted; only the stems that grow above the ground are cut and dried in the shade. It is used mostly to treat throat diseases. The dried plants are added to boiled water, and after 30 minutes, the tincture can be used to cleanse the throat or ingested in small amounts. It thus helps to treat throat diseases and cure sore places and inflammation in the throat.

Šarvaj is part of the *Artemisia macrocephala*, *Asteraceae* family, known in Mongolian as *eerem šarilž* and *tsarvan*. It grows at high altitudes, in stony or sandy places, alongside *Achnatherum splendens* (*terezin*), and in old campsites. *A. macrocephala* has long and neat finger-like stems that grow from 6 to 30 cm; it has egg-shaped seeds. The plant is used to treat throat diseases, tonsillitis, and dry cough. It is harvested during the flowering period in July and August and collected in a light textile bag, in which it is hung to dry on the interior yurt wall. The concoction is made by adding the dry plant to boiled water and letting it steep for 5–10 minutes. This remedy is used to cleanse the throat. It is effective in treating purulent tonsillitis. The *A. macrocephala* tincture also helps bring down fever and to treat dry cough.

Ak kek-daman is a member of the *Anemone crinita*, *Ranunculaceae* family, known in Mongolian as *segsger iarguyžin* and *bugin tsagaan*. *A. Crinita* grows in the foothills of high mountains, in moist places, between stones, and on riverbanks. It is a perennial plant, whose straight stems are 20 to 30 centimeters tall and are covered in hair. Its small white flowers have petals with blueish veins in the middle. *A. crinita* is harvested in July and dried in the shade. It is boiled in water, and the mixture is then applied to open wounds. To help extract snake venom, it is applied to the bite. It is also useful in cases of rectal prolapse.

Yumdüüžin is part of the *Dianthus superbus*, *Caryophyllaceae* family, known in Mongolian as *žavxaalag bašir* and *yumdüüžin*. The Tsengel Tyva name is similar to the Mongolian one. It grows in the foothills, in forests where larch and birch grow, on riverbanks, and around springs. The fringed pink is a perennial plant that grows from 15 to 60 centimeters. At its top, it divides into several finger-like stems. The flowers are fringed and are pale red in color. They are picked in July and dried in a cool shady place. The plant is used for kidney and bladder disorders. To prompt uterus contractions and the detachment of the placenta after giving birth, the tincture is given after the *kara mün*.⁴

Xöveŋ-čėček belongs to the *Leontopodium campestre*, *Asteraceae* family (see Figure 3). It is known in Mongolian as *talin tsagaantürüü*. It grows in the foothills of mountains, in forests where larch and birch grow, and on riverbanks. It grows to a height of 15 to 20 centimeters and is a perennial. Its stems are

green, and each stem has two to three flowers. *Leontopodium* is harvested in July, dried, and is usually kept in a pillowcase. People with headaches and high blood pressure use pillows with *Leontopodium* inside. This plant is respectfully called ‘the flower of longevity’.



Figure 3. *Leontopodium campestre* in the Tандi-Uula Mountain range’s southern slope, July 2016. (Photo by Victoria Soyán Peemot).

Ak möögü (Mong. *tsagaan möög*) is the *Agaricus bisporus*; it grows wild in Tyva and Mongolia, and it is probably the only mushroom species that local people gather and consume. It usually grows in wet places after rain, in meadows with soft soil. Its hat is 6 to 19 centimeters broad, and the top of its cap is white. It is harvested any time it is available and is mixed with food and digested. It helps to prompt uterus contractions after a woman gives birth. It is cooked and given to children to cool a fever.

Čalbīs-sigen is part of the *Dracocephalum foetidum* Bunge, *Lamiaceae* family and is known as *ömxiy šimeldeg* in Mongolian. It grows on riverbanks and in stony places. The plants grow separately from each other. An annual, it has multiple stems ranging from 8 to 30 centimeters in height. Its flowers grow in groups of six on the top of stems alongside leaves. The flowers’ stems are blue, light blue, and pale. This plant is harvested in August and dried. It is edible but is mostly used due to its medicinal properties. People with bile disorders and

suffering from unstable stomach acid levels drink a small bowl of this concoction prepared by boiling the plant in water. Drinking a mixture of the plant and cold spring water cleanses the gastrointestinal tract.

Söd-sigen belongs to the *Sanguisorba officinalis* L., *Rosaceae* family. Its Mongolian names are *emiyn söd* and *söd övs*. The great burnet is a perennial plant with a hard thick stem that is thicker at the bottom; it grows to a height of 20 to 100 centimeters. This plant is used as food for people and livestock. Its tops are gathered in August and September and dried. It is mixed with hot water, and the tincture resembles a strong black tea in color. It is effective as a treatment for diarrhea and also helps to stop stomach pain and burning in the chest. Inhaling the smoke of burning dry *söd-sigen* helps to stop nosebleeds.

Xoy-artiš is part of the *Juniperus sabina* L., *Cupressaceae* family. Its Mongolian name is *xonin arts*. It grows on the sunny sides of mountains at high altitudes. Its fragrant stems have green-blue juicy berry-like pods; inside, there are one to six seeds. The Tsengel people use this grass as a fire starter and as cleaning, or purification, of bad things. Its ash is mixed with tobacco snuff.

4 Conclusion

There are approximately 660 medicinal plants belonging to 130 families in Mongolia. Among them, about 330 species are endemic, that growing only in Mongolia (Volodia, Tserenbalžir, and Lamžav, 2008). The use and protection of medicinal herbs is currently one of the critical debates in the world. Due to the wide use of plants in medicine, these plants have been harvested in excessive amounts with or without proper knowledge of them. This leads to dwindling biodiversity. Most importantly, we do not know how to properly appreciate the valuable resources of our homeland.

Currently, the Mongolian government allows for the purchase of harvested medicinal plants for a cheap price and their use in pharmacology. In Mongolia, there is a legal regulation establishing prices (per kilogram) for medicinal herbs. According to this regulation, the price for the rarest plant is 300–1000 Mongolian *togrog*; for a rare plant 150–500 *togrog*; and 50–300 *togrog* for a commonly available plant (Law of Mongolia on Natural Plants, 1995). On the one hand, it is necessary to produce medicine, but, on the other, this practice critically endangers some species. It is important to correctly recognize the medicinal herbs, to harvest and use them with caution, and to protect them according to regulations. The Tsengel Tyva people follow customary regulations that define a harvesting period and limit the amount of plants a person is allowed to take. Taking medicinal herbs in an inappropriate way and in large amounts provokes

‘the anger of nature’ – thunderstorms and lightning. It negatively impacts the well-being of the family and community and even endangers a (harvesting) individual’s life.

In this brief work, we attempted to share general knowledge about medicinal plants that have been used by the Tsengel Tyva people for many generations. We identified names of these plants in the Tyvan language and correlated them with scientific names. Considering the native names, most of them have a Turkic origin. Only a few names are calques from the Mongolian language. Further in-depth investigation of this topic, which includes comparative studies on plant names in different Turkic languages, is needed.

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Notes

1. Specific letters of the Tyvan Cyrillic alphabet are transliterated as follows: ө – ö, ү – ü, н – ŋ, ы – ĭ, й – y, ч – č, ш – š, ж – ž, х – x, and я – ia. Vowels are short, long, or pharyngealized. Pharyngealization is marked by the phonetic sign ʔ as in аʔт [aʔt]. The accepted spelling variations for Tsengel are [Цэнгэл] or [Сенгел]. Conventional transliteration is used for co-author Bayarsaikhan’s name and some toponyms.
2. The Tyvan expression ‘white food’ (Tyv. *ak čem*) refers to the dairy products: milk, fermented milk, a variety of cheese, and butter. The Tyva and Mongol pastoralists consider the dairy products as revered, sacred food.
3. For more on the concept *čer*, in the Tyvan language, see Peemot (2024: 8–10).
4. Translator’s note: this is a mutton broth given to a woman after giving birth to help her to gain strength. No offal or intestines can be boiled in the broth. In other instances, *kara mün* refers to the soup where meat, offal, and blood sausages have been cooked after slaughtering a sheep.

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Cognitive models used in the naming of plants in Yakut

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Abstract

This article presents an analysis of naming strategies for plants in the Yakut (Turkic) language. The purpose of this study is to consider the motivational features of herbaceous plant names and to identify the features of the cognitive mechanisms of plant naming. The present study analyzes a corpus of 52 Yakut plants including important taxa such as *ta:ljiit* (таалдьыт) *Holosteum umbellatum* L., *sutugax talax* (сутугах талах) *Salix pyrolifolia*, Ledeb., *timäx ot säbirdäxte:x ärbähin* (тимэх от сэбирдэхтээх эрбэһин) *Artemisia tanacetifolia* L., among others. The corpus was selected via continuous sampling using published dictionaries and lexicographic sources. Our results show that motivational features fall into the following groups based on ecology, utility, and sensation: place of growth, use in medicine/economic activity, and plant appearance or smell.

Keywords: phytonyms, pharmacophytonyms, Yakut (Sakha) language, plant names, motivational feature

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1 Introduction

The study of the naming of concepts is the science of names or *onomasiology*, i.e., naming theory. Matveeva (2010:266) proposed that, to determine the principles and methods of naming, the concept of a *motivational feature* of the inner form of the word be used. In the context of plant names, this assumes that any plant name may be connected to some kind of justification, a motive. Therefore, onomasiology describes the general patterns of the formation of language units, the relation between thinking, language, and reality. In addition, this field of linguistics is aimed at studying the linguistic landscape. Mark, Turk, Burenhult, and Stea (2011: 4) suggest that language reflects a number of cultural and cognitive issues, and linguistics has the tools to define and describe ideas about the linguistic landscape that are of particular interest to other areas of science. Thus, the linguistic landscape opens up an important connection between linguistics and disciplines such as anthropology, cognitive geography, and others that are related to language.

Previous work has explored these concepts in both regional and comparative frameworks. Merkulova (1967) studied the names of wild edible herbs, mushrooms, and berries from an etymological viewpoint. Thus, Merkulova studied the word formation structure and semantic motivation of phytonymic vocabulary, describing the origin of words. Merkulova's monograph *Essays on the Russian Folk Nomenclature of Plants* (1967) researched the folk names of plants. This work used dialect dictionaries and records of dialect speech.

Berestneva (2008), who examined plant names in English and Russian, studied the comparative and semantic-motivational aspects of genetically unrelated languages in her dissertation research. In addition, Mirzakhanova (2007) compared the phytonymic vocabulary of the Azerbaijani language with other Turkic languages, taking into account their genetic and semantic features. Rubtsova (2015) studied the pharmacophytonyms of Russian, Mari, German, and Latin as a special lexico-semantic group. She described the main principles for naming medicinal plants in languages with different structures in a comparative aspect.

Lukyanova's dissertation *Dialect Phytonymy in the Cognitive-Onomasiological Aspect* (2018) is devoted to the study of the mental processes of cognition about the natural world by long-time residents of the Middle Ob region. Using concepts from cognitive linguistics, which deals with the processing, storing, and transmitting of knowledge about the world through language, she identifies two main types of cognitive categorization of plants: sensory perception and rational experience. Thus, according to Lukyanova (2018: 213), 'the

dialect's representation of a naive picture of the world determines the presence of a small number of phytonyms that objectify the archaic way of knowing and explaining the natural world as a living being'.

Through etymology and the study of various environmental and linguistic factors reflected in the names of plants, researchers have sought to deepen their understanding of the nature of the pharmaceutical, nutritional, and non-food uses of medicinal plants. This paper focuses on identifying the motivational indicators of plants naming in the Yakut language.

2 Materials and methods

This paper uses a descriptive analysis with elements of comparative methods to identify the main patterns of motivational features of medicinal phytonyms in the Yakut language. In the study we examined 52 Yakut phytonyms extracted through the method of continuous sampling from the following dictionaries: *Large explanatory dictionary of the Yakut language*, edited by P. A. Sleptsov (2007); *Dictionary of the Yakut language* by E. K. Pekarsky (1959); *Dictionary of Russian-Latin-Yakut plant names of Yakutia* by A. M. Petrov (2002); and *Dialectological dictionary of the Yakut language* by P. S. Afanasyev, M. S. Voronkin, and M. P. Alekseyev (1976). Moreover, material was collected from consultants, including herbalists, elderly people, and residents of settlements.

3 The study area: The Republic of Sakha (Yakutia) and the Yakut language

The territory of the Republic of Sakha (Yakutia) covers an estimated area of 3,103 square kilometers; thus, it is the largest region of the Russian Federation, covering about 2/3 of the total area of Western Europe (see Figure 1). The region is significantly removed from the Atlantic Ocean, separated by mountains from the Pacific Ocean, and its climate is influenced by cold Arctic air masses. Thus, the whole of Yakutia is dominated by a harsh continental climate, with long cold winters, short hot summers, and a small amount of precipitation. Harsh climatic conditions account for permafrost in this region, the annual deep freezing of the active layer of the earth and the development of cryogenic processes in thick soil (Alekseev, 2020: 8). The climate of this part of Siberia, despite its enormous extent and significant differences in latitude is quite homogeneous. Winter begins everywhere at almost the same time. From the first days of September the country becomes colder, and it begins to freeze; in the first half of October it is covered with a continuous blanket of snow that does not disappear until

spring. By the end of that month, all the rivers are almost completely frozen, the lakes long covered with ice, and the accumulation of snow up to half a foot, and winter reigns in all its severity.

According to archaeological and ethnographic data, Yakutia was formed as a result of the absorption of local tribes by southern Turkic-speaking settlers (probably from the Baikal region). The traditional economy and material culture of the Yakut people have many features similar to the culture of the pastoralists of Central Asia, but there are also northern taiga elements (BSE, 1976: 1479).



Figure 1. Map of the Republic of Sakha (Yakutia).

Source: <https://www.britannica.com/place/Sakha-republic-Russia>

The Yakut (Sakha) language is a Turkic language and considered one of the oldest of this large family of more than 30 Turkic languages. It mostly preserved its ancient characteristics due to its isolated geographic location compared to other Turkic languages. The culture and language of the Sakha people formed over a long period of time as a result of the turkicization of the population, initially in the Upper Lena and later in the Middle Lena basin. The Yakut language was the first one to separate itself from the common Proto-Turkic language (Sleptsov, 2007: 274) and is quite different from most Turkic languages since it has an extensive layer of vocabulary of unknown origin and a voluminous layer of vocabulary assimilated from Mongolian and Tungus-Manchu languages. The prominent Polish researcher Vaclav Seroshevsky (1993: 111) called the Yakut language ‘the lingua franca of North-Eastern Siberia’, noting its role as a language of interethnic communication among the peoples of northeastern Siberia where the Yakut people have coexisted for centuries with many other ethnic groups such as Evens, Evenks, Dolgans, Yukaghirs, Chukchis, and Russians.

4 Results

4.1 Yakut phytonyms according to the appearance of a plant

Plant family	English transcription	Yakut	Translation	Latin
Asteraceae	<i>sippi:rdiŋi ärbähin</i>	сиппиирдини эрбэһин	broomy sagebrush	<i>Artemisia scorparia</i> Waldst. and Kit
Asteraceae	<i>timäx ot säbirdäxte:x ärbähin</i>	тимэх от сэбирдэхтээх эрбэһин	with leaves in the form of buttons	<i>Artemisia tanacetifolia</i> L.
Asteraceae	<i>altan bas</i>	алтан бас	cuprum head	<i>Taraxacum ceratophorum</i> (Ledeb.) DC.
Asteraceae	<i>altan töbö</i>	алтан төбө	cuprum head	<i>Taraxacum ceratophorum</i> (Ledeb.) DC.
Plantaginaceae	<i>kärämäs boxsurŋana</i>	кэрэмэс бохсурҕана	gray plantain	<i>Plantago major</i> L.
Poaceae	<i>kulun kuturuga</i>	кулун кутуруга	foal tail	<i>Alopecurus pratensis</i> Bourg. Ex Lange
Poaceae	<i>xomustuŋu kulun kuturuga</i>	хомустуну кулун кутуруга	foal tail as khomus	<i>Alopecurus arundinaceus</i> Poir.

Figure 2. Yakut phytonyms with motivational bases ‘according to the appearance of a plant’.

The Yakut speakers gave plants a variety of names based on appearance in connection with attributes used to distinguish each plant from many other morphologically similar ones. The category ‘appearance’ includes such elements as stem, leaves, root and characteristics such as shape, size, color, etc.

The motivational base for the two-component name *sippi:rdiŋi ärbähin* (сиппиирдини эрбэһин) *Artemisia scorparia* Waldst. and Kit. (Ivanova, 1990: 137) is that the stem, leaves, and flowers of *Artemisia*, resemble a bunch of branches. Yakuts probably associated the plant with *sippi:r*, which in Yakut means a bunch of twigs, willow rods for sweeping.

In the following example, one can see the metaphorical motivation: *timäx ot säbirdäxte:x ärbähin* (тимэх от сэбирдэхтээх эрбэһин) *Artemisia tanacetifolia* L. (Ivanova, 1990: 139) (literally, ‘with leaves in the form of buttons’). Here we see a comparison of small wormwood flowers with small round buttons.

In the two-component names of dandelion *altan bas* (алтан бас) *Taraxacum ceratophorum* (Ledeb.) DC. (Ivanov and Ivanova, 2009: 59) (literally, ‘a cuprum

head”) and its phonetic variant *altan töbö* (алтан төбө). (Novgorodov, 2003: 42) is a comparison of the yellow golden head at the top of the stem of this species of dandelion with the head of a man. Presumably, the choice of color in the plant name here is dictated by the time when it flowers since the color of dandelion flowers varies greatly, ranging from white to shades of pink and yellow.

The next two-component name is *kärämäs boxsurуana* (кэрэмэс бохсурбана) *Plantago major* Bourg. ex Lange (Novgorodov, 2003: 52), literally translated as ‘gray plantain’. In this species of plantain, white filaments in the stamens probably caused the association of the plant with gray hair on a human head.

The common name ‘foxtail’ is associated with two different species of *Alopecurus* in the Yakut language, *kulun kuturuga* (кулун кутуруга) *Alopecurus pratensis* L. (Petrov, 2002: 56) and *xomustuңu kulun kuturuga* (хомустуңу кулун кутуруга) *Alopecurus arundinaceus* Poir. (Gogoleva, Struchkova, and Fedorova, 2016: 11) (literally, ‘foal tail as *khomus*’). The Yakuts associated the tail of a baby horse with this flower’s inflorescence. The next nominative complex *xomustuңu kulun kuturuga* (literally ‘foal’s tail in the form of reed’) is a three-component name, which is quite rare. Here, the name of the plant is also motivated by the appearance of the inflorescence with the addition of the third lexeme *xomustuңu*.

4.2 According to use in economic activity

Plant family	English transcription	Yakut	Translation	Latin
Asteraceae	<i>üörä oto</i>	үөрэ ото	grass for a brew	<i>Artemisia vulgaris</i> L.
Betulaceae	<i>minnik talaya</i>	минньик талаба	broomstick	<i>Betula glandulosa</i> Michx.
Betulaceae	<i>sippi:r talaya</i>	сиппиир талаба	broomstick	<i>Betula glandulosa</i> Michx.
Cyperaceae	<i>sörüö ot</i>	сөрүө от	grass mat	<i>Schoenoplectus lacustris</i> (L.) Palla
Cyperaceae	<i>sörüönnük</i>	сөрүөннүк	mat	<i>Scirpus orientalis</i> Ohwi.
Salicaceae	<i>örüü üöte</i>	өрүү үөтэ	braided grass	<i>Salix viminalis</i> L.
Salicaceae	<i>sigä talaya</i>	сигэ талаба	willow for a strap	<i>Salix bebbiana</i> Sarg.
Salicaceae	<i>sutugax talax</i>	сутугах талах	willow for a strap	<i>Salix pyrolifolia</i> Ledeb.
Salicaceae	<i>sutuka talax</i>	сутука талах	willow for a strap	<i>Salix pyrolifolia</i> Ledeb.

Figure 3. Yakut phytonyms with motivational bases ‘according to use in economic activity’.

Plants have always had a special place in Yakut life, because life in the extreme conditions of the North required the ability to find food and medicine among quite common plants. Because of that, the Sakha people found practical uses for many wild plants. For example, the two-component nominative complex *üörä oto* (үөрэ ото) *Artemisia vulgaris* L. (Novgorodov, 2003: 49) consists of the lexemes *üörä* (a brew prepared from dried finely chopped edible grass or sapwood with milk) (BTSJJ, 2015, V. 12: 490) + *ot* (grass), literally denoting ‘grass for a brew’. The name of this plant was motivated by its practical use as food. Yakuts used to collect pine or larch bark in spring for preserves (sapwood) for cooking soups, pot pies, or porridge. The Russian traveler and scholar Jacob Lindenau wrote that the Yakuts dried some of the harvested sapwood completely and made noodles of the remainder. Sapwood was also mixed with cereal flour to save it since only rich Yakuts had it in abundance (Lindenau, 1983: 27).

The deciduous tree genus *Betula* has the following name in the Yakut language *minnik talaya* (минньик талаҕа) *Betula glandulosa* Michx. (DSYY, 1976: 159) (literally, ‘broomstick’), and *sippi:r talaya* (сиппиир талаҕа) (literally, ‘broomstick’) are two-component names. In these cases, the names are motivated by the economic use of the tree, i.e., its use in the manufacture of brooms. The use of birch or willow for brooms by the Yakuts is due to their strength and resilience.

Included in this group of phytonyms are the names for bulrushes in particular, *sörüö ot* (сөрүө от) *Schoenoplectus lacustris* (L.) Palla (Gogoleva, Struchkova, and Fedorova, 2016: 20), where *sörüö* is a ‘mat’ + *ot* a ‘grass’ (literally, ‘grass mat’), and *sörüönnük* (сөрүөннүк) *Scirpus orientalis* Ohwi. (IOLRJ, 2018: 173) (from *sörüö* ‘mat’). Here the names of the plants are motivated by the fact that Yakuts made various wicker products, such as baskets and storage vessels. In addition to bulrushes, willow branches were also used for making baskets – *örüü üöte* (өрүү үөтэ) *Salix viminalis* L. (DSYY, 1976: 205), where *örüü* is ‘braided’ + *üöte* is ‘willow’ (literally ‘braided grass’). Yakut names for willow – *sigä talaya* (сигэ талаҕа) *Salix bebbiana* Sarg. (DSYY, 1976: 205) (literally, ‘willow for a strap’); *sutugax talax* (сутугах талах) *Salix pyrolifolia* Ledeb. (Kulakovsky, 1979: 436) (literally, ‘willow for a strap’); *sutuka talax* (сутука талах) (BTSJJ, 2004, T. X: 167), (literally, ‘willow for a strap’), were used for making lanyards, because willow branches are quite flexible and strong material, which is the reason for choosing this particular tree.

4.3 According to use of plants as medicines

Plant family	English transcription	Yakut	Translation	Latin
Polygonaceae	<i>kiabakī</i>	кыабакы	belly between navel and crotch	<i>Persicaria hydropiper</i> (L.) Delarbe
Asparagaceae	<i>sūrāx ot</i>	сүрэх от	heart-herb	<i>Maianthemum bifolium</i> (L.) F.W.Schmidt
Caryophyllaceae	<i>ta:ljīt</i>	таалдьыт	spleen	<i>Holosteum umbellatum</i> L.
Plantaginaceae	<i>bias tīmīr</i>	биэс тымыр	five veins	<i>Plantago major</i> L.
Plantaginaceae	<i>bias tīmīrda:x ot</i>	биэс тымырдаах от	grass with five veins	<i>Plantago major</i> L.
Crassulaceae	<i>kū:s ot</i>	күүс от	power herb	<i>Rhodiola rosea</i> L.
Lamiaceae	<i>sīnn'atar ot</i>	сынньатар от	relaxing herb	<i>Leonurus cardiaca</i> L.
Saxifragaceae	<i>čilīgīras</i>	чылыгырас	to make the sound of a small splash	<i>Bergenia crassifolia</i> (L.) Fritsch.

Figure 4. Yakut phytonyms with motivational bases ‘according to use of plants as medicines’.

Yakuts have used and believed in the healing power of plants and animals. Thus, one-component name of the herbaceous plant knotweed *kiabakī* (кыабакы) *Persicaria hydropiper* (L.) Delarbe (literally, ‘belly between navel and crotch’) comes from the Yakut base *kiabak*, denoting: 1) the part of the body (between navel and crotch); or 2) ‘an ancient women’s metal dress, worn at the front below the navel on top of the underwear’ (Pekarsky, 1959, T. 2: 1351). The plant has long been used in the treatment of various chronic diseases of the urinary tract, gastrointestinal organs, as well as in uterine bleeding. In this connection, in the name of the medicinal plant there was a reference to the name of the diseased organ. The following plant *sūrāx ot* (сүрэх от) *Maianthemum bifolium* (L.) F.W.Schmidt (BTSJJ, 2004, T. IX: 293) (literally ‘heart-herb’), used in the treatment of cardiovascular diseases and as an antipyretic, also contains the name of the organ in the treatment of which it is directly used. The name of *Holosteum* in the Yakut language is represented by the name *ta:ljīt* (таалдьыт) *Holosteum umbellatum* L. (Petrov, 2002: 47) (literally, ‘spleen’), also motivated by the name of the organ for the disease of which it is used, namely, the spleen.

The two-component name *bias timir* (биэс тымыр) *Plantago major* L. (Ivanov and Ivanova, 2009: 126) was based on the shape of the leaf. This plantain species has lanceolate leaves with arched veins, which were presumably associated by the Yakuts with the veins on human hands. In addition to the above, a motivational feature here is the sign of the ‘use in economic activity’ of the plantain, as plantain is used for diseases of the joints and veins. The three-component name of the plantain *bias timirda:x ot* (биэс тымырдаах от) (Yakovleva, 2009: 18) was formed by adding to the previous example the Yakut hyperonym *ot*.

Pharmacophytonyms applied to plants with strong restorative and sedative properties are *kü:s ot* (күүс от) *Rhodiola rosea* L. (literally, ‘power herb’) and *sinn’atar ot* (сынньатар от) *Leonurus cardiaca* L. (Consultant: Olesova¹) (literally, ‘relaxing herb’). Here two-component plant names are motivated by the result or effect obtained from the action of the plant.

The derivative *čiligiras* (чылыгырас) *Bergenia crassifolia* (L.) Fritsch is used to name *Bergenia* (Kulakovsky, 1959: 444) (from *čiligira*: ‘to make the sound of a small splash’). In this case, the motivation implies the result of treatment by means of the plant. In general, it has a wide range of action and is used in the treatment of a variety of diseases, one of which is disease in the urinary tract.

4.4 According to place of growth

Plant family	English transcription	Yakut	Translation	Latin
Plantaginaceae	<i>boxsuryan</i>	бохсурҕан	plantain	<i>Plantago major</i> L.
Polypodiaceae	<i>ta:s oto</i>	таас ото	stone herb	<i>Dryopteris fragrans</i> (L. Schott)
Polypodiaceae	<i>xaja battaya</i>	хайа баттаҕа	mountain hair	<i>Dryopteris fragrans</i> (L. Schott)
Polypodiaceae	<i>ta:s xajaya ü:när böörö si:r oto</i>	таас хайаҕа үүнэр бөрө сиир ото	herb eaten by a wolf that grows on stone mountain	<i>Dryopteris filix-mas</i> (L.) Schott
Grossulariaceae	<i>ta:s mo:nn’oḡono</i>	таас моонньоҕоно	black currant of a stone	<i>Ribes nigrum</i> L.
Equisetaceae	<i>ta:s boru:ta</i>	таас боруута	stone horsetail	<i>Equisetum arvense</i> L.

Salicaceae	<i>ta:s talaya</i>	таас талаҕа	stone willow	<i>Salix saxatilis</i> Turcz. ex Ledeb.
Menyanthaceae	<i>kuta kulga:ya</i>	кута кулгааҕа	bog's ear	<i>Nymphoides pel- tata</i> (S.G. Gmel.) Kuntze
Primulaceae	<i>kuta aha</i>	кута аһа	bog's food	<i>Lysimachia thyr- siflora</i> L.
Asteraceae	<i>biri:</i>	бырыы	marsh	<i>Gnaphalium uliginosum</i> L.
Rosaceae	<i>le:bi</i>	лээби	marsh	<i>Comarum palus- tre</i> L.
Cyperaceae	<i>badilya</i>	бадылҕа	marsh	<i>Eleocharis palus- tris</i> (L.) Roem. and Schult.
Cyperaceae	<i>mara</i>	мара	swamp	<i>Eleocharis palus- tris</i> (L.) Roem. and Schult.
Equisetaceae	<i>ju:r boru:ta</i>	ойуур боруута	forest's horsetail	<i>Equisetum sylvat- icum</i> L.
Ericaceae	<i>tübä otono</i>	түбэ отоно	berry in the depths of a forest	<i>Vaccinium vitis- idaea</i> L.
Ericaceae	<i>čagda uñuoxta:x otono</i>	чагда унуохтаах отоно	pine forest's berry	<i>Arctostaphylos uva-ursi</i> (L.) Spreng.
Butomaceae	<i>küöl aha</i>	күөл аһа	lake's food	<i>Butomus umbel- latus</i> L.
Butomaceae	<i>küöl salaxaja</i>	күөл салахайа	lake's seaweed	<i>Butomus umbel- latus</i> L.
Araceae	<i>küöld'üt</i>	күөлдүт	lake dweller	<i>Lemna trisulca</i> L.
Equisetaceae	<i>örüs boru:ta</i>	өрүс боруута	rivers's horsetail	<i>Equisetum sylvat- icum</i> L.

Figure 5. Yakut phytonyms with motivational bases ‘according to place of growth’.

The Republic of Sakha (Yakutia) has incredibly rich flora and fauna scattered over hundreds of thousands of square meters. Since the climate is an extremely continental one, characterized by long winters and relatively short summers, plants here have adapted to the lack of heat, strong winds, and extremely low temperatures. Thanks to this climate, most of the territory of Yakutia is sparsely populated and not industrially developed, so it is an ecologically rich area. Due to harsh climatic conditions, the emergence of plants is slowed, and their

growing season is quite short. Russian traveler and geographer A. F. Middendorf wrote of the ‘incredible mystery’ in the ability of the plants of Yakutia to grow rapidly and bloom under the most unfavorable conditions, precisely at a time when the trunk and roots are still immersed in hibernation, and when the whole plant freezes through at night (Seroshevsky, 1993: 70). The phytonyms in this category refer to the contours of this diverse landscape and connect to its mountains, waters, swamps, forests, yards, and reservoirs, reflecting the geographical features of the territory of Yakutia.

The name of the medicinal plant plantain is represented by the one-component name *boxsuryan* (бохсурҕан) *Plantago major* L. (BTSJJ, 2005, T.2: 425), derived from ‘to entangle, pull down; to stop’ = Turkic-Mongolian *boy*, *boyo* ‘to choke, squeeze; to block, to barricade’ (Popov, 1986: 115), and its phonetic variant *loxsuryan* ‘plantain’ (Pekarsky, 1959, T. 2: 1478). This can be attributed to associative connections caused by the fact that plantain grows almost everywhere and especially by the road. This probably formed the basis of this name for *Plantago major* L. In comparison with the names in the section above, motivated by morphology and applied to the same Latin species, this shows that plant naming in Yakut language depends on the scope of application, as the same plant may have two, three, or even more names.

Some names of herbaceous plants of the fern family, shield fern, *Dryopteris fragrans* (L.) Schott, are motivated in the Yakut language by the place of growth on a rock or cliff; in particular, the names *ta:s oto* (таас ото) (Novgorodov, 2003: 75) (literally, ‘stone grass’) and *xaja battaya* (хайа баттаҕа) (Consultant: Chirikova²) (literally, ‘hair of a stone’). Moreover, it should be noted that the naming here is secondarily motivated by the appearance of the plant, as it resembles hair growing out of the rock cliff. The next name, *ta:s xajaya ü:när börö si:r oto* (таас хайаҕа үүнэр бөрө сиир ото) *Dryopteris filix-mas* (L.) Schott (Yakovleva, 2009: 27) (literally, ‘grass that a wolf eats and which grows on the stone mountain’) consists of six components. This name specifies and details the properties of the plant exactly by its place of growth, thanks to the lexical unit *ta:s*, which in the Yakut language means ‘stone’. In fact, in Yakutia, the fragrant woodfern prefers stony soil and rocks.

Also, in its composition, the lexeme *ta:s* has the names *ta:s mo:nn’oyono* (таас моонньоно) *Ribes nigrum* L. (Consultant: Semenova³) (literally, ‘currant stone’), *ta:s boru:ta* (таас боруута) the ‘common name of horsetails’ *Equisetum arvense* L. (Kulakovsky, 1979: 440) (literally, ‘horsetail of stone’), and *ta:s talaya* (таас талаҕа) *Salix saxatilis* Turcz. ex Ledeb. (BTSJJ, 2004, T. X: 167) (literally, ‘stone willow’).

Swamp occupies about 5% of the total area of Yakutia and motivates the names *kuta kulga:ya* <кута кулгааҕа> *Nymphoides peltata* (S.G. Gmel.) Kuntze (IOLRJ, 2018: 535) (literally, ‘ear of the marsh’), *kuta aha* <кута аһа> *Lysimachia thyrsiflora* L. (Petrov, 2002: 67) (literally, ‘the food of the swamp’), *biri:* <бырыы> *Gnaphalium uliginosum* L. (Ivanov, 2018: 73) (from *biri:* ‘bog, marsh; swampy, marshy’), *le:bi* <лээби> *Comarum palustre* L. (Petrov, 2002: 92) (from *le:bi* ‘bog, marsh; swampy’), *badilya* <бадылҕа> *Eleocharis palustris* (L.) Roem. and Schult. (Petrov, 2002: 15) (from *badilyax* ‘marsh, swamp’), and *mara* <мара> ‘lakeside weed, impure in the water, a special kind of grass growing in a bog’ (Pekarsky, 1959, T. II: 1527) (from *mara* ‘a swampy, mossy place in the middle of a forest; overgrown with moss’).

The forest (woodland), which occupies 80% of Yakutia and is considered its national treasure, appears in plant names *oju:r boru:ta* <ойуур боруута> *Equisetum sylvaticum* L. (IOLRJ, 2018: 70) (literally, ‘forest horsetail’); *tübä otono* <түбэ отоно> *Vaccinium vitis-idaea* L., and *čagda uñuoxta:x otono* <чагда унуохтаах отоно> *Arctostaphylos uva-ursi* (L) Spreng. (Ivanova, 1990: 96) (literally, ‘pine berry with bones’) have lexical components in their composition referring to the forest (woodland). The importance of this environment is also seen in the appearance in these plant names of forest-related components derived from other languages of the region. For example, *oju:r* <ойуур> ‘forest’ from Mongolian *oj* <ой> ‘forest’, Buryat *ojjur* <ойжур> ‘to forest’ (Antonov, 1971: 23), *tuba* <түбэ> ‘thicket’ (Turkic stem), *čagda* <чагда> ‘pine forest’ from the Evenk *d’agda* <дягда> ‘pine tree’ (Antonov, 1971: 27).

The name of the herbaceous water plant *Butomus* L. is represented in the Yakut language by the name *küöl aha* <күөл аһа> *Butomus umbellatus* L. (Kulakovsky, 1979: 438) (literally, ‘lake food’) it grows most often right in the water near the banks of rivers and lakes. The derivative *aha* from Yakut as ‘food’ in the name is motivated by the fact that the people call it ‘Yakut wild bread’; the name of the plant reflects the practical use and place of growth of the herb. Names *küöl salaxaja* <күөл салахайа> (Попов, 1986: 118) (literally, ‘lake mud’), *küöld’üt* <күөлдүт> *Lemna trisulca* L. (IOLRJ, 2018: 183) (from *küöl* ‘lake’), and *örüs boru:ta* <өрүс боруута> ‘a species of horsetail’ *Equisetum sylvaticum* L. (Kulakovsky, 1979: 444) (literally ‘river horsetail’) have lexical units in their composition that reflect water space.

4.5 According to smell

Plant family	English transcription	Yakut	Translation	Latin
Lamiaceae	<i>sir sīta</i>	сир сыта	smell of the earth (soil)	<i>Thymus serpyllum</i> L.
Lamiaceae	<i>añilis</i>	аңылыс	to spread about the smell'	<i>Clinopodium vulgare</i> L.
Lamiaceae	<i>dirgīl</i>	дыргыл	pungent, spicy, pleasant smell	<i>Origanum vulgare</i> L.
Brassicaceae	<i>dirgīlla</i>	дыргылла	pungent, spicy, pleasant smell	<i>Hesperis sibirica</i> L.
Pinaceae	<i>ī:la:χ</i>	ыылаах	stinky	<i>Abies sibirica</i> Ledeb.
Pinaceae	<i>ī:la:χ mas</i>	ыылаах мас	stinky tree	<i>Abies sibirica</i> Ledeb.
Pinaceae	<i>ī:la:χ χarīja</i>	ыылаах харыйа	stinking spruce	<i>Abies sibirica</i> Ledeb.
Pinaceae	<i>sīṭigan χarīja</i>	сытыган харыйа	pungent smell	<i>Abies sibirica</i> Ledeb.

Figure 6. Yakut phytonyms with motivational bases 'according to smell'.

Smell plays a substantive role in human life; smells arouse feelings and emotions in us. In this category, we found names of phytonyms, conveying the odors of some plants in their names. In particular, *sir sīta* ⟨сир сыта⟩ *Thymus serpyllum* L. (Consultant: Permyakov⁴) (literally, 'smell of the earth (soil)'), and *añilis* ⟨аңылыс⟩ *Clinopodium vulgare* L. (Petrov, 2002: 79) (from *añilij* 'to spread about the smell'). Some names are derived from the Yakut adjective *dirgīl* ⟨дыргыл⟩ 'pungent, spicy, pleasant smell', such as *dirgīl* ⟨дыргыл⟩ *Origanum vulgare* L. (Petrov, 2002: 30), and *dirgīlla* ⟨дыргылла⟩ *Hesperis sibirica* L. (Petrov, 2002: 20). If *Origanum vulgare* has a spicy honey aroma, then *Hesperis* L. has a pleasant, floral aroma that intensifies at night.

Various names in the Yakut language describe a fir, a genus of the evergreen gymnosperm of the pine family (Pinaceae), such as *ī:la:χ* ⟨ыылаах⟩ *Abies sibirica* Ledeb. (Petrov, 2002: 80) (literally, 'stinky'), *ī:la:χ mas* ⟨ыылаах мас⟩ (DSYY, 1976: 317) (literally, 'stinking tree'), *ī:la:χ χarīja* ⟨ыылаах харыйа⟩ *Abies sibirica* Ledeb. (Ivanov and Ivanova, 2009: 123) (literally, 'stinking spruce'), and *sīṭigan χarīja* ⟨сытыган харыйа⟩. These plants' names consist of Yakut adjectives *ī:la:χ* 'pungent smell' and *sīṭigan* 'smelly, rotten'.

5 Discussion

In the course of this research, we examined 52 plant names in Yakut. The analysis showed that two-component names prevail: 62%, followed by one-component names at 29%. The main motivational features in the formation of plant names in Yakut are sensory characteristics such as the appearance and smell of a plant and ecological characteristics indicating a plant's place of growth.

These patterns are similar to those found in similar studies elsewhere. Kolahdüz (2018), analyzes more than 300 names of medicinal plants in Turkish and their analogues in Persian and finds that names connected to 'animals' comprise roughly 31% of names, 'color and taste' 27%, and 'time and place' 22%, with similar linguistic patterns among Persian and Turkish language phytonyms.

Ungerer and Schmid (1996: 45) propose that the scientific classification of plants, originally developed in the eighteenth century by the Swedish botanist Carl Linnaeus and subsequently refined, has presently reached a degree of formalization that aims at being exhaustive, objective, and universal, whereas folk plant terminology is considered to be rather limited, subjective, and culturally bounded. The revolutionary work carried out by Berlin, Breedlove, and Raven (1973) showed the intricacies of such naive plant naming systems. Hunn (1982) notes the particular practical and importance of systems of cultural knowledge, and the central importance of utilitarian elements in folk classification. Similarly, examples of folk phytonymy also reveal connections to the material and everyday side of the traditional culture of the Yakut. Since ancient times, plants have played an extremely important role in their life; various crops or their roots provided food. In addition, most of the plants used on the farm were mainly wild. As a result, people gave names to all plants essential to their lives. In this respect, the most convenient way was to name plants according to their inherent characteristics. Thus, phytonymy is that part of the vocabulary of the Yakut language that, in our opinion, is especially interesting and indicative from the point of view of both the material and spiritual culture of the people.

But these unique windows into the relationships of people and plants are at risk. Cámara-Leret and Bascompte (2021: 1) note that, by the end of this century, more than 30% of the 7,400 languages of the world will disappear. Drawing from examples in indigenous languages from three regions with high biocultural diversity, they show that speakers of these languages know certain pharmacophytonyms, i.e., more than 75% of the names of medicinal plants, as well as their areas of application. This knowledge is unique in nature, such that language loss constitutes the loss of valuable information about the use of plants and the possibilities of folk healing, which should not be allowed to disappear.

In connection with the announcement by the United Nations of the International Decade of Indigenous Languages (2022–2032), the problem of the disappearance of languages has become especially relevant because these indigenous languages contain knowledge – in particular, knowledge about plants and their use in everyday life. By its very nature, such medical knowledge is linguistically unique, that is, it is known only to speakers of a particular language, which could possibly be endangered. Each language of the world's indigenous peoples is a unique reservoir of medical knowledge, thanks to which it is possible to identify and preserve the contribution of nature for human benefit. The Yakut language vocabulary of medicinal plants remains poorly understood to this day, which speaks to the need for a comprehensive study and other measures to support this element of the cultural heritage.

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Notes

1. O. D. Olesova, (January 30, 1960) Namsky district of the Republic of Sakha (Yakutia).

2. N. K. Chirikova, (December 19, 1955) Amginsky district of the Republic of Sakha (Yakutia).
3. A. I. Semenova, (December 12, 1953) Verkhoyansky district of the Republic of Sakha (Yakutia).
4. E. R. Permyakov, (April 22, 1970) Namsky district of the Republic of Sakha (Yakutia).

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***The Cambridge Handbook of Heritage Languages and
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Reviewed by Sviatlana Karpava

The volume *The Cambridge Handbook of Heritage Languages and Linguistics* provides a comprehensive overview of interdisciplinary research on heritage languages, incorporating both applied and theoretical linguistics perspectives and approaches. It deals with micro-, meso- and macrolevels of heritage language research around the world. The book consists of four parts: (i) ‘Heritage Languages around the World’; (ii) ‘Research Approaches to Heritage Languages’; (iii) ‘Grammatical Aspects of Heritage Languages’; and (iv) ‘Heritage Language Education’.

In ‘Introduction: Heritage Languages, Heritage Speakers, Heritage Linguistics’, the editors Silvina Montrul and Maria Polinsky provide an overview of the volume. They give the definition of heritage language in relation to minority, migrant, and bilingual contexts, which is ‘language spoken at home or otherwise readily available to young children, and crucially this language is not a dominant language of the larger (national) society’ (Rothman, 2009: 156).

The authors take into account the complexity of the concept of heritage, which is connected to language, culture, and society. The nature of native speakerhood has been extensively discussed (Kupisch and Rothman, 2018) in connection with whether heritage speakers should be compared with mono- or

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bilinguals or treated as a special group. Various factors such as age, length of residence in the host country, schooling, size of the speech community, the vitality of the language beyond the home, identity and attitudes should be taken into consideration in research on heritage speakers. According to Polinsky and Kagan (2007), heritage speakers can be divided into two broad groups: (i) naturalistic learners and users who are not seeking to learn their heritage language in the classroom, and (ii) those who are trying to acquire a heritage language in a formal classroom environment.

It is important to support heritage speakers and their families with respect to heritage language use, maintenance, and transmission because bilingualism has cognitive, cultural, and economic benefits which cannot be ignored at individual, family, education, and societal levels. Recent interdisciplinary research on heritage languages is focused on their universality, specifically the different heritage languages in the same sociopolitical environments have in common (Montrul, 2008, 2016; Polinsky, 2018), for example, structural similarities, underlying cognitive and linguistic processes. Nonnative effects or divergence from the grammars of fluent speakers of the language have been mainly observed regarding morphology, long-distance dependencies, syntax-discourse interface in comparison to aspects of phonology and syntax. These nontarget effects can arise due to insufficient input and use of the heritage language, effects of the dominant language and low level of heritage language proficiency, which does not allow efficient language processing.

Part I 'Heritage Languages around the World', provides an overview of heritage language communities in different parts of the world, minority, immigrant, and indigenous settings, in the United States, Europe, Latin America, Canada, and Australia. The authors of the chapters deal with the heterogeneity of heritage language speakers regarding language proficiency, literacy skills, education, society, patterns of immigration, the size of heritage language communities, ideologies, and the sociolinguistic vitality of the heritage language in each part of the world. Chapter 1, 'Slavic Heritage Languages around the Globe', by Bernhard Brehmer provides information regarding heritage languages spoken in Western Europe, Israel, North and South America, Australia, and New Zealand, where Slavic is not the majority language. The author describes different types of migrant and immigrant Slavic heritage communities worldwide, home language use, maintenance and transmission in relation to globalization, sociopolitical, economic, and ideological factors (Laleko, 2013). Previous research showed that heritage languages have parallels regarding the restructuring, partial reduction, and simplification of phonology, grammar, and lexicon, and this suggests universal principles for language change and reshaping of heritage grammars.

The author emphasises the importance of further comparative research regarding autochthonous Slavic heritage communities and largely neglected Slavic languages like Belarusian, Bulgarian, or Slovak (pp. 36–37).

In Chapter 2, 'Heritage Languages in Europe', Tanja Kupisch goes over the heritage language (HL) research conducted in Europe with the focus on child, adolescent, and adult heritage speakers. It was found that many studies refer to cross-linguistic interference (CLI), but only a few include comparisons across generations regarding vulnerable linguistic properties. The author also pointed out that phonological CLI into the majority language is one of the most frequent (pp. 51–53). In addition, bidirectional CLI decreases with age and mainly one direction of CLI from the societal language into the home language prevails (e.g., Rinke, Flores, and Barbosa, 2017). Future research on heritage language, taking language contact and change into consideration, is needed with respect to comparisons across ages to understand the nature and direction of CLI and to support heritage language speakers. Furthermore, some languages from the Romance and Slavic families as well as Turkish are better represented in research, which is not the case with other languages such as the Germanic or Arabic languages. Chapter 3, 'Heritage Languages in Southeastern Europe' by Natalia Pavlou and Kleanthes K. Grohmann explores different linguistic contexts in southeastern Europe with a special focus on language varieties spoken in Cyprus. It provides a historical overview and demographics of Cyprus and gives insight into socio-psychological factors related to language contact situations and (heritage) language acquisition and use. Furthermore, it presents the case of Cypriot Greek, a low variety in Cyprus compared to Standard Modern Greek, which is a high or prestigious variety on the island, and the case of Sanna, a minority language spoken by Cypriot Maronite Arabs residing in Cyprus (pp. 77–79). The authors discuss heritage language contexts in southeastern Europe as well as linguistic features that characterise heritage speaker's grammar and social factors affecting heritage language development (Rothman, 2009; Polinsky, 2018).

In Chapter 4, 'Heritage Languages in China', Linda Tsung and Lubei Zhang look into heritage languages in China and provide detailed information regarding geographical areas where heritage languages are spoken, the size of heritage language communities, linguistic features, and the social functions of heritage language. In addition, the authors deal with historical and current language policies in China, which facilitates the maintenance and protection of heritage languages. Being a multiethnic and multilingual country, China has adopted a language policy which promoted linguistic and cultural diversity (pp. 98–99). On the one hand, it supports the use of Putonghua, Modern Standard Chinese, by all ethnic groups of China since the 1950s. On the other hand, minority

communities have the freedom to use their heritage languages (Zuo, 2007). Due to explicit policy and social and economic factors, however, heritage minority languages in China face both opportunities and challenges. Chapter 5, 'Heritage Languages in Japan and Korea', by Hyun-Sook Kang and James Hye Suk Yoon examines heritage languages in Japan and Korea. These countries are characterised by strict immigration policies based on monolingual, ethnically homogeneous national ideology (Watson, 2012; Fujita-Round, and Maher, 2017). Due to globalization, however, the increase in transnational mobility, marriage-based and professional migration, the number of foreigners in East Asia countries has risen. The authors compare the Japanese and Korean languages and show how the similarities between these languages affect the maintenance (or loss) of heritage Japanese in Korea and heritage Korean in Japan. This chapter emphasises the importance of future research in the field (p. 124).

In Chapter 6, 'Heritage Languages in Israel: A Multilingual Tapestry with Hebrew Threads', Natalia Meir, Susan Joffe, Ronald Shabtaev, Joel Walters, and Sharon Armon-Lotem present the complex picture of multilingualism in Israel based on a historical overview. According to the authors, Hebrew is used for religious and literacy purposes, whereas other languages such as Yiddish, Judeo-French, Ladino, or Judeo-Arabic serve other community and home functions. One-language-one nation with Hebrew as the official language is the dominant ideology in Israel today. Arabic currently has a special status (Meir and Sandler, 2019). The authors discuss the situation regarding various heritage languages spoken by immigrants residing in Israel, in particular English, Russian, Amharic, Yiddish, and Juhuri, taking social and linguistic factors into consideration (p. 148). Chapter 7, 'Heritage Languages in Aotearoa New Zealand and Australia', by Corinne A. Seals investigates linguistic diversity of Australia and New Zealand and the differences between these countries regarding heritage languages (including Indigenous, native, and immigrant languages), language policies and practices. New Zealand, with a population of four to five million people and 160 languages spoken, and Australia, with a population between 24 and 25 million people and over 360 languages spoken, share a geographic region and a history of colonization (pp. 156–157). The researchers deal with heritage language education (Willoughby, 2018), language policy and planning, heritage language speakers' identities, and family language policy, the wellbeing of heritage language speakers, language revitalisation and language rights, especially regarding Indigenous languages in Australia and New Zealand.

In Chapter 8, 'Heritage Languages in Canada', Naomi Nagy provides an overview of Canadian HL research with the focus on sociolinguistics, language variation and change, attitudes, and linguistic practices based on acquisition

experimental studies, elicited speech, spontaneous speech corpora and ethnographic observation, pedagogical approaches, and applications (e.g., Di Salvo, 2017). The author gives specific details regarding heritage varieties of Cantonese, German, Greek, Italian, Inuktitut, Korean, Mandarin, Russian, Spanish, Tagalog, and Ukrainian spoken in different parts of Canada. The benefits of learning, speaking, and understanding heritage languages (HLs) are emphasised as well as further research on HLs to understand their features, structures, and malleability in relation to the HL context, HL education, HL speakers' practices and attitudes (pp. 196–197). Chapter 9 'Asian Heritage Languages in the United States: Chinese and Hindi Language Communities' by Shereen Bhalla, Na Liu, and Terrence G. Wiley explores heritage and community language education with respect to 'Chinese' and 'Indian' minority language communities in the United States. These two ethnolinguistic communities differ with respect to the linguistic, ethnic, and cultural diversities of their respective homelands. Mandarin and Hindi, the primary heritage languages of these communities, are considered to be the most widely spoken languages in the world and are related to the growing economies of India and China. The authors emphasise the importance of community-based education, multilingual language policy in the USA (Wiley, Arias, Renn, and Bhalla, 2016) to support the development of heritage languages.

In Chapter 10, 'The Vitality of Spanish as a Heritage Language in the United States', Maria M. Carreira investigates the field of Spanish as a heritage language (HL) in the United States. The author points out the necessity of future research and new perspectives on HLs and HL speakers. In addition, strengths and weaknesses in the area of the vitality of heritage languages in the US, in society, and in the area of education are discussed. The chapter addresses the need for a link between HL research and teaching and the implementation of advances in Spanish heritage linguistics and contact linguistics in Spanish HL instruction (pp. 223–224). Chapter 11, 'Germanic Heritage Varieties in the Americas Social and Linguistic Perspectives', by Janne Bondi Johannessen and Joseph Salmons examines Germanic heritage languages spoken in the western hemisphere, particularly Yiddish, Dutch, West Frisian, Afrikaans, Continental West Germanic varieties, North Germanic languages, Icelandic, Danish, Norwegian, and Swedish. The authors look at historical and social context and structural change in these heritage languages over multiple generations regarding several domains such as phonetics and phonology, morphology, syntax, pragmatics, and lexicon, the efforts of heritage speakers regarding HL maintenance and shift (pp. 241–243). In addition, they stress the importance of future interdisciplinary research (Westergaard and Lohndal, 2019). In Chapter 12, 'Arabic in North America',

Abdulkafi Albirini examines the situation regarding heritage Arabic language in North America in relation to historic, sociolinguistic, sociocontextual, and socioaffective factors. The author points out the existence of two varieties of Arabic (p. 277): Colloquial Arabic (CA) and Standard Arabic (SA), which display differences in their acquisition, structure, functions, and sometimes context of use (Ferguson, 1964[1959]; Albirini, 2019). The chapter reveals that heritage SA has a unique linguistic system regarding phonetics/phonology, lexicon, morphology, syntax, and proper language use, which is affected by cross-linguistic interference. Heritage Arabic is sustained by heritage speakers due to positive attitudes toward Arabic, family support, and the link between their L1 and Arab and Muslim identities.

Chapter 13, 'Heritage Languages in South America', by John M. Lipski explores the use, maintenance and transmission of heritage languages in the context of Latin America, which has become home to many migrant communities. In particular, the author explores Spanish-speaking South American settings and Brazil. Emigration to Latin America happens for various reasons such as labor, religion, family, economy, and politics (e.g., Howard, 2015). The status of a heritage language and its recognition is related to the size of the migrant community as well as the attitudes of heritage speakers, their self-esteem, and identity. The chapter reveals the complex picture of linguistic and cultural diversity and heritage languages in Latin America, which provides both challenges and opportunities for linguistic analysis (pp. 322–323). In Chapter 14, 'Language Attrition and Heritage Language Reversal in Returnees', Cristina Flores and Neal Snape examine how language input affects the language competence of bilingual speakers, specifically returnees (pp. 354), who after a period of migration return to their home country (Flores, 2010). Thus, these bilinguals undergo the reversal of the dominant environmental language after their return. Their former heritage language (HL) becomes the societal language, whereas the former majority language becomes the HL (Flores, 2019). This situation is interesting in terms of research on language acquisition and language attrition in relation to sociolinguistic factors and education. It was found that dominant language attrition may be mitigated by level of attainment in the L1, L2, or 2L1. But more research is needed on the role of extra-linguistic variables such as the quantity and quality of exposure, age, and literacy skills in the maintenance of the former majority language of returnees.

Part II, 'Research Approaches to Heritage Languages', presents different approaches to the study of heritage languages. Chapter 15, 'Heritage Language Research and Theoretical Linguistics', by Elabbas Benmamoun discusses key syntactic aspects of heritage languages, particularly phrase structure, word

order, and word order alternations, negation, and head movement. In addition, the author addresses major issues in theoretical syntax with respect to heritage language research. The analysis of previous research shows that heritage learners are able to converge on core areas of the grammar of the baseline. Heritage speakers show vulnerability regarding morphosyntax, such as agreement, aspect, case, and the phonological realisation of the root as well as the syntax-semantics interface (Polinsky, 2018), which is not the case with the basic phrase structure of the heritage language, word order and head movement. It can be assumed that interface phenomena require more extensive and rich input in situations of heritage language acquisition (pp. 393–394). In Chapter 16, ‘The Emergence of Heritage Language: A Case Study from Korean’, William O’Grady and Chae-Eun Kim provide an overview of heritage language research based on examples from Korean. The authors emphasise the role of input in language acquisition and development, for which heritage languages do not constitute any exception. When learners have restricted input and sparse opportunities to use the language and particular linguistic structures (e.g., reflexive pronouns, certain types of relative clause), they can resort to strategies that place the least demand on their processing resources or partial acquisition (Scontras, Fuchs and Polinsky, 2015). This chapter suggests that heritage language research can contribute to a more comprehensive understanding of language acquisition and development (pp. 417–418).

Chapter 17 ‘Sociolinguistic Approaches to Heritage Languages’ by Andrew Lynch and Netta Avineri, deals with methodological approaches to heritage language research with the focus on the social and affective dimensions of HL acquisition and use taking micro-, meso- and macrolevels of analysis into consideration. The authors look at national and local spheres, public and private settings of heritage language use, and variability related to political and ideological factors. They also offer some suggestions for future research via the integration of sociocultural and sociolinguistic perspectives on community, context, culture, and language varieties (p. 438). The emphasis should be given to learners’ strengths (DuBord and Kimball, 2016), education, pedagogical approaches, curriculum development and planning, as well as social justice (Ortega, 2020). In Chapter 18, ‘The Psycholinguistics of Heritage Languages’, Jill Jegerski and Irina A. Sekerina analyse previous psycholinguistic research (p. 450) on adult heritage speakers (e.g., Jegerski, 2018) and provide examples of studies that implemented real-time experimental measures such as eyetracking, self-paced reading, and other reaction time methods, both in terms of comprehension and production data, covering a range of both linguistic domains from phonology to discourse and research methods. The authors deal with speech perception and

production, lexical, morphological, and syntactic and discourse processing. In addition, they address the issue of cross-linguistic interference between the two languages of a heritage bilingual as well as the role of language background variables like age of acquisition, early exposure, and proficiency level.

Chapter 19, 'Contact Linguistics and Heritage Languages' by Itxaso Rodríguez-Ordóñez and Lorena Sainzmaza-Lecanda, refer to the contact linguistics theory that suggests that the outcomes of linguistic contact forms can be explained by linguistic, psychological, and cultural factors. Language is understood as an interplay of human faculty and social competence. According to usage-based approaches to contact linguistics, the investigation of heritage grammars can inform researchers about bilinguals and multilinguals. The authors address the issue of cross-linguistic interference, cross-linguistic priming, and contact-induced changes which depend on structural similarities and differences between the dominant and the heritage language as well as social factors such as the social dynamics of the heritage community (Zenner, Backus, and Winter-Froemel, 2019). Heritage speakers can be considered agents of linguistic change. The chapter recommends continuing cross-linguistic comparative research within and across heritage communities (pp. 489–490). In Chapter 20, 'A Narrative-Ethnographic Approach to Research on Heritage Language Development', Agnes Weiyun He presents a qualitative approach to research on heritage language development – narrative ethnography. This approach combines field-based, interaction-enriched methods of linguistic anthropology with textbased methods of narrative analysis. The author discusses the benefits and challenges of this approach, its epistemological and methodological orientations for HL research, and its potential to advance knowledge about heritage language development and learning (pp. 512–513). One of the challenges of the narrative ethnography is the validity and credibility of data collection, analysis, and interpretation (Creswell, 2013).

Chapter 21 'Corpus-Based Methodologies in the Study of Heritage Languages' by Olesya Kisselev explores one of the methodological approaches to heritage language research – corpus linguistics (Gries, 2011). With the advancement of computer technology, it has become prominent in the study of language, both of standard and learner varieties. This methodology allows the analysis of large principled collections of authentic texts, known as language corpora, with the help of computer-aided tools and techniques (p. 521). It contributes to new insights into the nature of language, the understanding of linguistic structure, language change, and language development. The author emphasises the importance of applying corpus linguistics methods to the study of heritage languages and the creation of heritage language corpora. In Chapter 22, 'Current Trends

and Emerging Methodologies in Charting Heritage Language Grammars', Fatih Bayram, Grazia Di Pisa, Jason Rothman, and Roumyana Slabakova discuss new methods in heritage language research, which can provide deeper insights and answers into complex questions pertaining to heritage language development and bilingualism. The analysis of previous research showed that the competence/performance variation within heritage speaker populations is not random. The implementation of both online and offline measures might provide a more complete picture regarding variation and the individual experiences of heritage speakers. The authors suggest that it is important to conduct inter- and intragroup investigations (p. 569) taking into consideration various age groups, linguistic domains, and experience factors (Kidd, Donnelly, and Christiansen, 2018).

Part III, 'Grammatical Aspects of Heritage Languages', deals with structural aspects of heritage languages, phonetics and phonology, semantics, pragmatics, and morphosyntax, and their relevance for theoretical linguistics, showing the systematicity of the heritage language grammars. The chapters in this section present the analysis of both production and comprehension data from heritage languages suggesting that heritage grammar differ from the grammar of the baseline language due to fundamental changes in the underlying representations. The authors of the chapters reveal the affinity between baseline speakers and heritage speakers, especially with respect to comprehension compared to L2 speakers. Chapter 23, 'Phonetics and Phonology of Heritage Languages' by Charles B. Chang, examines the following research questions: (i) What do adult heritage speakers know about the sound system of their heritage language? and (ii) How do heritage speakers pattern in the sound system of their dominant language (Polinsky, 2018)? The author provides an overview of the previous research on heritage language and phonetics and phonology (Choi, Cutler, and Broersma, 2017). It has been observed that heritage speakers do not have difficulty with aural comprehension and can have native-like pronunciation in their heritage language, which is not the case with vocabulary and grammar. Even though heritage speakers have strong listening and pronunciation skills, they differ from L1-dominant native speakers since they are not exactly 'native'. (p. 601).

In Chapter 24, 'Morphology of Heritage Languages', Michael T. Putnam, Lara Schwarz, and Andrew D. Hoffman provide an overview of the previous research on heritage morphology, which gives evidence that most syntactic and phonological properties of heritage grammars are largely invulnerable to significant restructuring (pp. 613–614). According to Lohndal (2014), morphological properties are the result of computational processes. Production-comprehension asymmetries regarding morphology have been observed as well as the ability of returnees to reestablish their heritage grammar with targetlike morphology and

a high degree of accuracy (Flores, 2020). Further research is needed regarding such under-researched empirical domains, such as the derivational morphology of fusional languages, morphological properties of heritage varieties of isolating languages, by including diverse groups of heritage speakers. Chapter 25, 'Syntax of Heritage Languages', by Terje Lohndal examines the syntax of heritage languages. As suggested by previous research, the grammatical competence of heritage speakers is based on the same principles and constraints as the grammatical competence of all other native speakers, even though representational outcomes may be different. Heritage speakers are bilinguals with one clearly defined dominant language, thus, their grammars may exhibit certain hallmarks, which differ from a given baseline (p. 659). According to Polinsky (2018), certain properties of the syntax of heritage languages are resilient, whereas others are quite vulnerable, compared to a given baseline. Furthermore, the syntax across heritage languages tends to be uniform and differs 'from their respective baseline grammars in comparable ways' (Polinsky, 2018: 223).

In Chapter 26, 'Semantics of Heritage Languages', Tania Ionin provides an overview of the research on semantics and related interface phenomena in heritage language grammars. According to Slabakova (2008), semantics is not subject to critical period effects, thus it can be assumed that semantics is acquirable by both L2 learners and heritage language speakers and that the challenge is in acquiring the target mappings between morphosyntax and semantics. The authors look into a number of phenomena in HL grammars that are found on the interface between semantics and morphosyntax and examine (i) whether they are subject to incomplete acquisition and/or attrition in HLs (Montrul, 2008); (ii) whether there is cross-linguistic influence from the dominant language; and (iii) whether HL grammars diverge from monolingual grammars in the domains discussed (pp. 684–685). Chapter 27, 'Discourse and Information Structure in Heritage Languages' by Oksana Laleko, deals with the research on discourse-level properties of heritage languages (p. 693). Among the major trends observed in experimental studies and analysis of the data are (i) areas of convergence between high-proficiency heritage speakers and monolingually raised speakers; (ii) differences in interpretation or different quantitative preferences between the groups, a reduction of options in the variety undergoing change, and no fundamental qualitative reorganisation of the underlying grammar; and (iii) measurable contrasts between the heritage and baseline speakers which suggest representational differences due to a qualitative reanalysis of the relevant structures in the HL (Polinsky and Scontras, 2020). The author emphasises the importance of further research in this area.

In Chapter 28, 'Pragmatics in Heritage Languages', Irina Dubinina provides a critical overview of the current state of knowledge regarding the pragmatic competence of heritage speakers. She points out that this type of research is still sparse (e.g., Dubinina and Malamud, 2017), but it makes an important contribution to the understanding of the linguistic knowledge and abilities of heritage bilinguals. Studies on heritage language pragmatics deal with speech-act realisations and normative politeness in heritage languages as well as the emerging profile of heritage speakers' pragmatic competence. More research is needed on a greater variety of heritage languages in different language contact situations and a broader group of heritage speakers regarding age, proficiency levels, sociolinguistic backgrounds and cross-linguistic influence to provide a full picture of the heritage speakers' pragmatic knowledge (pp. 750–751).

Part IV, 'Heritage Language Education', explores the education of heritage language speakers in different countries and settings in relation to a variety of educational models at school and university levels, access to bilingual education and community schools for heritage language development, language policy, and ideologies. Chapter 29, 'Elementary School Heritage Language Educational Options and Outcomes' by Kim Potowski, discusses the benefits of dual language programmes (pp. 766–767) with respect to the development of language proficiency and literacy skills of heritage speakers, both in their dominant language and heritage language, which is critical for their future success. These programmes help to support heritage language use, maintenance and transmission, and to overcome language shift and language loss (Potowski and Marshall, 2021). The author describes the situation regarding dual language programmes in the USA and worldwide and how their early start (at the primary level) can boost the subsequent academic success of the learners at higher levels of their education.

In Chapter 30, 'Community-Organized Heritage Language Programs', Jin Sook Lee and Huay Chen-Wu provide an overview of the existing community heritage language (CHL) programmes (p. 779), which function outside of the traditional school day and are organised and often operated by community volunteers (Nordstrom, 2016). The authors give details with respect to heritage language programmes that exist in diasporic post-immigration contexts, also referred to as Saturday Schools, Weekend Schools, Ethnic Schools, Mother Tongue Schools, Community Schools (i.e., in Canada), Supplemental Schools (i.e., in Australia), and Complementary Schools (i.e., in the United Kingdom). They discuss the functions and roles of community heritage language programmes and types of existing CHL programmatic models. This chapter raises awareness about CHL programmes and promotes their visibility for a more effective heritage language education across nations.

Chapter 31, 'Curricular and Programmatic Language Development Opportunities for University-Level Heritage Language Learners', by Sara Beaudrie explores higher education programmes which serve the growing number of students interested in furthering their heritage language abilities (p. 805). The author points out that many higher education institutions have designed several programmatic options, which vary according to available resources, student population, and institutional support (Carreira and Kagan, 2018). The analysis of previous research shows that there is an emerging shift towards innovative alternatives and goals for heritage language instruction. The focus of this chapter is on research and current educational practices primarily in the US context. However, insights drawn from this research may be of interest to researchers and practitioners working in international contexts (Kagan, Carreira and Hitchins Chik, 2017; Potowski, 2018). In Chapter 32, 'Instructed Heritage Language Acquisition', Melissa A. Bowles and Julio Torres provide information about instructed heritage language acquisition (IHLA), a subfield within heritage language (HL) studies that addresses the effects of instruction on HL development. Recently, there has been an increased interest in better understanding the pedagogical needs of HL learners and the language development of HL learners who arrive in the instructed setting with some functional knowledge of the HL (e.g., Carreira and Kagan, 2018). Researchers have implemented different theoretical perspectives such as task-based and processing instruction in their studies (e.g., Torres, 2018). Bowles conducted a quantitative metaanalysis of these studies to gauge the overall effects of instruction on HL development (p. 828).

Chapter 33 'Issues and Practices in Community-Based Experiential Learning for Heritage Speakers in the United States' by Paola Guerrero-Rodriguez, Adriana Ojeda, and Diego Pascual y Cabo, explores the benefits of community-based service learning (CSL) (p. 582), which aims to draw on learners' previously held knowledge and experiences for the benefit of both learners and the community (Pascual y Cabo, Prada, and Lowther Pereira, 2017; Lowther Pereira, 2018). The analysis of the previous research has showed that there is an increase in CSL initiatives. However, the number of studies on heritage language and on CSL is still scarce. The authors give details regarding the positive effect of CSL on legitimation of heritage languages, heritage speakers' self-efficacy, identity and sense of belonging. In Chapter 34, 'Developing Spanish Heritage Language Biliteracy', María Cecilia Colombi investigate a functional pedagogy of language focusing on how people use language to make meanings with each other as they carry out their social lives (pp. 869–870). The set of choices are available in language systems, which are constrained by two factors: (i) meaning that is always constructed in the context, and (ii)

(lack of) access to all the possible contexts within the culture or community (Christie and Unsworth, 2000). In this respect, the implementation of social theories of language in heritage language teaching is a great benefit to heritage language communities. Heritage pedagogical practices allow heritage speakers to develop active citizenship, a critical linguistic and cultural awareness of language practices in different social contexts apart from the professional or academic ones (pp. 884–885). Chapter 35, ‘Heritage Language Assessment’ by Kimi Kondo-Brown, deals with the assessment of heritage language (HL) speakers, which is an indispensable component of HL instruction and student learning (p. 893). Because of administrative and financial restrictions HL assessment is not an easy task for HL teachers. The analysis of the previous research shows that assessment is beneficial for students since teachers provide feedback and support to the students and facilitate the learning process (Carreira, 2012). The author suggests that HL teachers need to improve their assessment practices based on enhanced knowledge and experience, the use of relevant assessment tools, and practical implications. In addition, HL teachers should have more professional development opportunities with the focus on L2 assessment in general and HL assessment in particular.

In Chapter 36, ‘Embracing Opportunity in Heritage Language Revitalization’, Maria Schwedhelm, Kate Stemper, and Kendall King discuss heritage language revitalisation research and address the following questions: (i) How do communities centre or prioritise language documentation among other revitalisation efforts; (ii) Who should take responsibility in the work of language revitalisation; (iii) What roles should researchers take in those efforts; and (iv) How does linguistic diversity and influence from the dominant language interact with the demand to establish linguistic norms and standards (pp. 927–928). The authors provide information about how challenges and obstacles to Indigenous and heritage language revitalisation can be overcome by new innovative approaches such as the development of Indigenous language teaching and learning materials, documenting a heritage language and strengthening community autonomy (McIvor, 2020).

Chapter 37, ‘Heritage Language Planning and Policy’ by Terrence G. Wiley, provides an overview of research in the area of heritage language planning and policy (HLPP) with the primary focus on US planning and policy (pp. 940–941). Wiley discusses foundational concepts regarding language policy and planning (LPP) and their implications for HLPP as well as current directions in HLPP. In addition, there is an emphasis on a comprehensive macrolanguage framework that includes HLs based on language education and sufficient resources by overcoming restrictive ideologies of the Americanisation and English-only

movements of the prior century, anti-immigrant or racist agendas, taking the history of language policies toward immigrant and minority groups (Fishman, 2014) into consideration.

Coedited by two leading international specialists, with its accessible style, broad coverage, and theoretical and practical focus, this volume is essential reading for both newcomers and established scholars in the field of heritage languages and linguistics. Divided into four sections covering various topic areas, it provides a complete, authoritative, and up-to-date overview of the state of the field. This helpful work provides frameworks for understanding heritage languages and linguistics based on diverse topics and analyses. Each chapter highlights a topic area, covering key concepts, examples of previous interdisciplinary research and studies from different geographical regions and languages, critical review and analysis, specific projects undertaken by the authors and their personal reflections. This book is ideal for students of (applied) linguistics, psycholinguistics, sociolinguistics, language acquisition, and (heritage language) education, as well as practitioners, teachers, parents, experts, and researchers wishing to update their knowledge regarding heritage languages and linguistics.

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Review

***Speak Not: Empire, Identity and the Politics of Language*
James Griffiths (2021)**

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Reviewed by Danping Wang

Speak Not: Empire, Identity and the Politics of Language is a well-crafted and insightful exploration of the role of language in shaping identity and power dynamics in three distinct regions, Wales, Hawai'i, and southern China and Hong Kong. James Griffiths, the author of the book is a Hong Kong-based Asia correspondent for *The Globe and Mail*, a Toronto-based Canadian newspaper.

James Griffiths' journalistic style makes the book highly engaging while informative, hence effectively giving rise to thought. His effortless use of anecdotes, quotes, and historical accounts draws readers in and keep them reading, which makes the book itself popular reading for postgraduate students and researchers in gaining an overview of Western perspectives on mainstream discourse regarding politics of language in the postcolonial world. His writing is clear and engaging, making complex ideas accessible to readers without sacrificing depth or nuance. In particular, his detailed examination of the sociolinguistic and historical backgrounds of language use in these areas are grounded in the narrative and lives of people in the language movements examined. As a journalist, James skilfully weaves together historical analysis, geopolitical conflicts, and contemporary events to create a comprehensive account of language politics. His stimulating work is particularly commendable in providing valuable, contextualised information for understanding the complex relationships between power, language, and identity.

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In *Speak Not*, Griffiths provides a fascinating exploration of the ways in which language is used to assert power throughout history and how its use can be weaponised to reinforce the existing colonial legacy and social hierarchies in modern times. Drawing on a wide range of case studies from around the world, he makes a compelling case for the importance of understanding the politics of language for getting a grasp on how power operates in society. Because it has been written by an influential journalist, the book has been highly praised and extensively reviewed by mainstream Western media. From an academic standpoint, especially for students without proper academic research training, it is important to note that the book is predominantly located in the mainstream Western discourse on language policy and ideology in postcolonial regions (Connell, 2006). Therefore, to develop a more comprehensive perspective, it is essential for one's reading journey of this text to be accompanied by a broader range of literature.

The book is structured against three pillars of case studies (Welsh, Hawaiian, and Cantonese) alongside two additional sections on Afrikaans and Hebrew that serve as intermissions. The first part examines the history of language policy in Welsh. Given the author's personal background and his rich knowledge in the rise and fall of Welsh, the first part offers a strong start to the book. In this section, Griffiths evaluates the effects of the Industrial Revolution, a development that was fuelled by empire and resulted in a substantial number of English-speaking labourers migrating to South Wales. The arrival of these English workers caused the Welsh language to decline to minority status, which, in turn, gave rise to the modern and, at times, violent Welsh nationalist movement as a response. Griffiths shows how the spread of English and other global languages has both facilitated and challenged the dominance of English cultures and ideologies and how this has led to debates on linguistic imperialism and cultural homogenisation. Overall, the author examines the revival of the Welsh language as a model for safeguarding the linguistic heritage of future generations. The Welsh language has been enthusiastically embraced by many individuals of Welsh descent, including of Griffiths' family, who had not spoken the language for several generations.

The second part discusses Hawaiian as a language on the brink of extinction due to colonialism and the Republic of Hawaii's citizenship requirements. The role of education in preserving the language and culture is highlighted, with the experiences of the royal family and descendants of missionaries as examples. Griffiths shows how language is not a neutral or apolitical tool but a crucial aspect of how power is exercised and contested in society, which valorises social injustice (Piller, 2016). He also highlights the importance of language rights and

linguistic diversity as key elements of social justice and democracy. Language is a crucial aspect of how power operates in society and understanding the politics of language is essential for understanding broader social and political issues. Griffiths shows how the imposition of English and other European languages in colonial contexts was a deliberate strategy to exert control over colonised peoples and cultures and how this legacy continues to shape linguistic politics today.

The third section of this book focuses on Cantonese in Hong Kong. Compared with the previous two cases, this part contains more recent social events and articles that resemble news articles rather than academic research. The author began the first chapter in this part with an ambitious claim that British colonialism was a force for good that contributed to the flourishing of Cantonese and its cultural influence worldwide. Through an analysis of historical events and stories about renowned figures in China, the author argues that the British colonial government's *laissez-faire* approach to language policy in Hong Kong, as opposed to the harsh English-monolingual policies implemented in India and Africa, allowed the Cantonese to continue to be taught in Chinese schools. However, this argument overlooks important demographic and historical factors that contributed to the development of Cantonese in Hong Kong and may present a contradictory portrayal of British colonialism as a benevolent force in preventing its decline under the influence of Mandarin/Putonghua. In particular, the promotion of Putonghua did not reach Hong Kong schools until after the 1997 handover. Academic research and literature show that globalisation and the hegemony status of English are the primary reasons for postcolonial regions to prioritise English over local languages and dialects (Macedo, Dendrinos, and Gounari, 2015).

While the author raises concerns about the survival of Cantonese, the claim of a generational decline is not supported by evidence. In fact, Cantonese boasts a speaker base of over seventy million in mainland China, Hong Kong, and the Chinese diasporas. This is in stark contrast to such languages as Welsh, which has about 538,000 speakers in Wales, and Hawaiian, which has about 20,000 speakers. The book's pervasive worries about the death of Cantonese seem premature and, worryingly, show that they have succumbed to some manipulative discourses in English media surrounding the promotion, teaching, and learning of Mandarin Chinese outside of the People's Republic of China (Weinmann, Slavich, and Neilsen, 2021). Such discourse has been deeply politicised among Hong Kong's social elites and is used to mobilise young students to join anti-China movements, calling for the protection of language diversity and equal rights, while resenting Mandarin speakers and cultures as inferior and uncivilised

(Liu, 2017). This politicisation of language exacerbates social injustice in Hong Kong because it seeks to establish Cantonese as a symbol of Hong Kong's independence at the expense of other languages and the diverse population of the postcolonial city, such as marginalised South Asian minorities (Wang, 2022).

From an academic perspective on language and language education, all languages are equally important for our linguistic diversity, and seeking dominance or superiority of one language over another is a remnant of the colonial legacy and mindset. In postcolonial Hong Kong, as Wang and Tsung (2022) point out, Chinese – including Cantonese, Hakka, Teochew, and Mandarin/Putonghua – remains a local or regional language, whereas English is the currency and global language that promises a socially upward mobility. As such, the book's analysis of language issues in Hong Kong and beyond needs to be read with caution and a critical eye. Additionally, the third part has limited space to account for the complicated cases of Tibet and Xinjiang. Again, these areas are mentioned for the interest of Western media, rather than for in-depth and balancing insights.

Overall, the book is an important contribution to the field of sociolinguistics and language planning, providing valuable insight into the complex relations between language, identity, and power. One of the strengths of the book is Griffiths' ability to highlight the diverse ways in which language is intertwined with issues of power, identity, and culture. From colonialism to nationalism to globalisation, he shows how language has been used to both maintain and challenge dominant power structures and how linguistic politics are often at the forefront of social and political struggles. *Speak Not* is an excellent book for anyone interested in the intersection of language and power. Especially those who are interested in exploring the complex and multifaceted dynamics of linguistic politics, particularly in the context of European imperialism and nationalism, are likely to find the book a valuable resource.

Nonetheless, this book may not be the best fit for all readers or contexts. First, it has covered a wide range of topics, names, and examples which could make the book feel somewhat difficult to follow at times. Another critique of the book is that it focuses primarily on the historical and contemporary experiences of Europe and its former colonies, with relatively little attention paid to linguistic politics in other regions of the world. Given the growing importance of non-European languages and cultures in global affairs, the book is of limited interest for research students outside of the Anglophone West. Another limitation of the book could be that it assumes a certain level of prior knowledge and familiarity with the historical backgrounds and political science behind the eloquent language. Some of the book's arguments and language are challenging to follow if the reader is not already well-versed in these disciplines. While the book

does provide numerous examples and case studies to illustrate its arguments, it may require a certain level of intellectual engagement and commitment to fully appreciate its contributions to the study of language and power.

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Review

***Individuality in Language Change*
Lynn Anthonissen (2021)**

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Reviewed by Anindita Sahoo and Roshni Ramanan

Individuality in Language Change by Lynn Anthonissen is the culmination of a project, emphasising two specific types of aims, i.e., the philological/historical descriptive aim that studies the rise of special passives in Early Modern English and the theoretical/ methodological objective to understand language as a complex adaptive system (pp. 3–4). The ‘complex adaptive systems’ theory addresses individuals as non-static agents within the macrosystem of language; it speaks to issues relating to individuality in language change (Holland, 1995, 1998). The theory addresses the extent and nature of lifespan change, interindividual variation and the effect of microlevel changes on the macrolevel of language. In light of this theory, the text adopts ‘constructionist’ assumptions which explicate that linguistic knowledge is shaped and reshaped by experience and that no two speakers have the same mental grammar (p. 4).

The proof of individual differences is amply evidenced in corpus linguistics research and related linguistic fields which demonstrate differences in language use, L1 acquisition of core grammatical constructions, and variation in language development induced by differences in education and socioeconomic status (Barlow, 2013; Pace, Luo, Hirsh-Pasek, and Golinkoff, 2017). With this focus on the individual, the book attempts to move past Chomsky (1965) where he discusses the ‘ideal speaker-hearer’ and ‘language of the speech community’ in order to recognize interspeaker differences. It recognises language change in a community as a consequence of recurrent changes among individual users who conventionalise neologisms rather than invent new ones. At an individual level,

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the text notes the scope for a social analysis of change and a cognitive analysis of change-patterns/tendencies of individual variation based on the organisation of our mental representation of language and how adults adapt to language change.

In the same constructionist vein, the book attempts to explore how linguistic malleability, assuming it exists post-adolescence, manifests itself. Constructional environments give way to novel patterns and features. Community-level studies of change have constantly demonstrated evidence of this. Constructional environments include the immediate patterns a construction collocates. But it could also refer to related constructions within a network that the speaker can associate based on their similarity. Two types of effects are noted in this volume as a result of this process: the environmental effect which addresses the patterns a construction collocates with and the network effect which accommodates related constructions in a network into one's mental grammar based on the similarity.

Anthonissen explores three essential research questions. First, how do variation and change at the individual level interact with change at the community level? Second, is there evidence of constructional change post-adolescence in syntax? If yes, how closely do lifespan changes follow community trends? Third, are related linguistic patterns like special passives associated in individual mental grammars? Do these constructions influence each other's development in individual usage? She finds her answers through the exploration of two interrelated linguistic constructions that have evolved and transformed over time: prepositional passives and nominative and infinitive passives (pp. 7–8).

The book defines prepositional passives as passives whose subject corresponds to the nominal complement of the preposition in the active voice, demonstrated by examples such as 'They were laughed at'; 'They're cried out against' (phrasal-prepositional verb); and 'They're taken notice of' (multi-word expressions). Nominative and infinitive passives are underlined as passives that feature a PCU verb (perception, cognition or utterance verb) followed by a to-infinitival complement, as exemplified by 'He is said to be a thief' (utterance), 'He is assumed to be a legend' (cognition) and 'He was heard to say: "It wasn't me"' (perception). The increase in the rate of usage of these passives can be attributed to the historical development that fixed SV(O) as the default sentence pattern. The text links the necessity for a topical or unmarked subject with the rise of the passivisation phenomenon, whereby a given object could be an unmarked subject in the preferred clause-initial linking position. It aims to trace the development of these structures both at the microlevel of the individual and at the macrolevel of the broader community.

The book is divided into four parts; the central component of the work is highlighted in sections 2 and 3, while the first and last sections are tools that

serve to introduce and conclude the text. Part One comprises the introductory chapter. In the first chapter, the author traces the line of inquiry through which the book came to be. She thoroughly explicates the goals of the text and the research questions around which it revolves. She succinctly lays down the theoretical foundations from which these queries rise. The book further introduces the reader to the approach employed in methodological investigation and briefly references some key details regarding the corpus used in research. The author is effective in evoking and satiating the reader's interest by offering an outline of what is to follow by systematically stating the aims of the book, its underlying queries, the issues at stake which the questions attempt to address, and the methodology and corpus to address them.

Part Two comprises chapters 2 to 4. In chapter 2, the author elaborates on and structures the theoretical foundations previously discussed. She argues for an extensive model of language that can inform the interplay of individual knowledge and community knowledge, which she encapsulates by inspecting language as a complex adaptive system (p. 13). She argues for the theoretical and methodological benefits of this approach whilst exposing prior research gaps in utilising these tools (p. 19). She explicates these gaps through the investigation of unique and shared knowledge, catering to queries regarding learning across one's lifespan (p. 28).

After embedding the theoretical base, the author traces the evolution of the English language in chapter 3, particularly in terms of historical developments relevant to the issues at stake such as the decline of its verb-second tendencies, embracing SVO as the fixed word order (p. 50) and gravitating towards syntactic and information-structural principles, the fundamentals of which the author breaks down (p. 43). Finally, she highlights the evolution of the passive constructions under study in this backdrop and their impact on Modern English grammar (p. 63).

Having set the context in which the English language underwent historical transformations, Chapter 4 outlines the linguistic contexts in which the passives under study emerged. The author enlightens the readers on the prepositional passives and the NCI constructions by outlining their history from the times of early English, expounding on their origin and spread, discussing their structure and function, and linking them in terms of their impact on other syntactic entities with ample examples. By grounding these constructions systemically in the settings that sprouted them, the author unveils multidimensional aspects of structural change. She utilises this diachronic analysis to find that syntactic change is 'non-disruptive' and depends on similarities to existing 'supportive' constructions (p. 113).

Section Three comprises chapters 5 through 8. The author argues that a major limitation in prior literature has been identifying the necessary tools to conduct similar investigations. This is where she paints the benefits of the EMMA (Early Modern Multiloquent Authors) corpus which serves as a quintessential tool to assist in this endeavour. In Chapter 5, Anthonissen makes convincing arguments regarding the methodological and sociological advantages that substantially inform the architecture of EMMA's design, from which the corpora presented in the book is extracted (pp. 117–118). She highlights the individual and social criteria that prove to be the fulcrum of author selection, offering the readers figures and tables that call attention to author lifespans and careers (pp. 118–124). She elaborates on text and author metadata, with visual depictions of networks that interlink EMMA informants across generations, through live social relationships, and by way of citation and mention connections (pp. 125–129). Finally, she concludes the chapter by explaining the mechanisms that were productive in text-based and author-based sampling, with transparency regarding the drawbacks of both approaches.

In chapter 6, the author traces the diachronic path along which prepositional passives evolved in the seventeenth and eighteenth centuries. Here, the text adopts as its descriptive goal an outlook on this evolution through the lens of the individual and that of the community and, as a related theoretical goal, to analyse the interaction of micro- and macrosystems. Through the study of prepositional passives, the aim is to explore key research questions regarding (a) whether linguistic change occurs solely intergenerationally or if it also occurs during the lifetime of individual speakers, (b) the impact of entrenchment and conventionalisation in linguistic change over time, (c) the extent to which inter-individual variation is socially stratified and the manner in which language is influenced by social networks and communities (p. 131).

These questions are attempts to evaluate the impact of individual speakers in effecting community change and to determine whether change occurs due to lifespan change (intragenerational change) or due to the changing population (generational change). This is essentially studied through usage-based frequency at different levels: the community level, the individual level, and the generational level. The social, cognitive, and linguistic effects based on usage patterns are studied. The impact of type repetition and token repetition, of prepositional passive schema and V-P combinations, is studied to offer a cognitive explanation of language change. Since variation can be socially structured, how language reflects social membership and social network proximity is analysed. The author establishes language change as a complex process that results from changes in the speech of individual speakers, who adapt to their communities

during social interaction. This claim bolsters the notion that long-term linguistic change can occur based on frequency shifts in individual speech that happen when adapting to community conventions. The text organises the results, grounded on the locus of change, into three categories based on the impact of linguistic, cognitive, and social factors.

Answering a key research question set out in the introductory framework, Chapter 7 explores whether constructional change in syntactic constructions can occur across the lifespan of an adult, exploring post adolescent linguistic malleability. It investigates the diachronic trajectory along which nominative and infinitive constructions evolved and traces the differences between the journeys individual authors undertook in their use of these structures. With regard to the NCI constructions, the fundamental question deals with why the passives are preferred to their active counterparts. While this can be partially explained by the rise of passives in Early Modern English, this book investigates the role of the specialised semantics of the NCIs which result in their being prioritised over ACIs. Noël (2008) has hypothesised regarding the rise of NCIs as an evidentiality marker; Los (2009) added to this by proposing that the loss of V2 created a need for subject topics and propelled the use of NCI constructions. Drawing upon these studies, the text undertakes a quantitative study to test these hypotheses.

Anthonissen examines the semantics of the passivised matrix verb on the basis of an assessment of the semantic-pragmatic usage types and analyses potential correlations between functions and verb semantics. She conducts a correspondence analysis to assess the semantics of the NCI constructions in terms of their relationship to the associated matrix verbs. She explores the semantic development of the NCI, as proposed by Noel, against the backdrop of the lifespans of individual speakers. A diachronic analysis is conducted to check if constructional change is evidenced over the course of an individual speaker's lifespan and the manner in which such potential changes are reflected. The differences in the general frequencies of the usage of NCIs, and the distribution of semantic-pragmatic usage types across an adult life span, are thoroughly investigated.

Chapter 8 is the last chapter in Part Three, and here Anthonissen tackles the challenge of the prior treatment of diachronic construction grammar from a macro lens, with limited research tying it to the micro roots of the individual. The author utilises historical corpora to unveil an understanding regarding constructional taxonomies in authors at the level of the individual. She takes up two interwoven goals in this regard. First, microlevel usage patterns of the passives are exemplified and employed to verify whether hierarchically correlated

constructions are systematically related in an individual's conception, which would underscore the understudied role played by cognition. Secondly, in the event that any two constructions, such as the passive structures the text explores, are established as cognitively related, the author explores the extent of mutual influence and co-evolution. To do so, she conducts a diligent and methodical comparison of longitudinal patterns of use at the micro and macro level.

The author clearly outlines the data set utilised and the methodology employed to determine the extent to which individual language emits the special passives under investigation (pp. 220–222). With the same lucidity, she demonstrates that, despite the differences in individuals' varying use of these constructions, a similarity in any given individual's use of passives persists (pp. 222–236). The dynamics of the constructional bond between the NCI and prepositional passives is then analysed and established as dissociated during the period of investigation (pp. 236–239). The author proves that the loosening of the constructional bond can be attributed to 'construction-specific developments' resulting from the dynamic interactivity between entrenchment procedures and constructional semantics (pp. 239–262).

The final section of the book recapitulates the aims the endeavour started out with, the path undertaken to accomplish methodological and descriptive goals, an outline of the resultant findings and self-admitted limitations of the text, in Chapter 9, which presents the 'Conclusion'. At the outset, the author recounts the age-old question of the existence and nature of linguistic transformation across an individual's lifespan and presents the EMMA corpus and its sister EM as relevant tools to find answers, explored in this book through the study of special passives that are cross-linguistically infrequent. Another goal of this endeavour was the evaluation of these passives in light of language-internal and contextual factors that contributed to their rise. Anthonissen restates the theoretical research questions that were outlined at the outset, which substantively inform the approach to and aims underlying the research undertaken (p. 267). The descriptive and theoretical goals of the work are analysed through the lens of the corpus and the findings highlighted in prior chapters (pp. 268–276). The author, considerate of the truism that research sometimes raises more questions than it answers, is transparent regarding the limitations of the study and outlines the scope for further research (pp. 277–278).

Chapter 10 contains the 'Appendix', which highlights relevant supporting information pertaining to the EMMA corpus, with a fact sheet and the main sources from which it has been compiled, charted out for the readers. This is immediately followed by tables and figures relating to the prepositional passives and lists of PCU verbs and statistical data pertaining to the NCI constructions.

The chapter also provides an overview of the author's other works that focus on her contribution to the field by offering insights into Anthonissen's areas of expertise and the impact of her work. By referring to these additional publications, readers can obtain a deeper understanding of the discussion related to cognitive and social mechanisms that construct special passives across the lifespan. This chapter, further, is followed by the bibliography and index of terms.

Regarding the tool that informed this book, the EMMA corpus is indispensable. The design and compilation of the EMMA corpus occurred as part of the Mind-Bending Grammars project. This research focuses on the written production of the 50 EMMA authors who span five generations of seventeenth-century authors. The criteria with which the authors were filtered includes the longevity of career with sufficient material across career stages (a minimum of 500,000 words per author), a demonstrable link with London, and social, political, and stylistic connections within and across generations. EMMA is a corpus that has a rich metadata database (containing social network information and mobility data from authors' biographies) and a corpus query and annotation tool, used for the retrieval and linguistic annotation of the special passives. The EMMA corpus can be utilised for in-depth analysis of linguistic behaviour and changes within individuals and across lifespans. Analyses can be carried out from multiple perspectives such as the cognitive dynamics of linguistic knowledge, historical sociolinguistics and intergenerational vs intragenerational change. The EMMA corpus, formed and compiled by Peter Petré and his team, attempts to assign equal import to data collection and sociolinguistic coverage. They have developed a custom interface to query the corpus and annotate the hits.

To expand on the author selection criteria, the individual criteria is that the author: (a) has produced a body of work comprising 500,000 words. Work is broadly defined to include scholarly treatises, plays, pamphlets, personal letters, and essentially any surviving written work. The size of an individual oeuvre is measured on the basis on provisional word counts of digitised texts and number of pages of volumes identified. The average author's work comprised a total of 1.6 million words; (b) to have had a relatively long career across which his or her works were distributed. This information is predominantly assessed on the basis of the starting date and the final date of the author's earliest and latest work, as contained in the corpus, which is cross-checked with biographical and bibliographic information pertaining to the author. The average length of an author's career span was deemed to be 30 years; and (c) to show a verifiable link to London society. To represent different sociocultural dynamics, both authors with weaker social and geographical ties to London and those who resided in London for over half their lives were considered in the corpus.

In terms of social criteria, the patterning of the authors' political, social, and stylistic connections have been taken into account. Relations between authors and the communities they belong to, as in 'quakers', 'royal chaplains', 'playwrights', and 'religious leaders', are identified, and these connections are typically close-knit, dense and multiplex. The distribution of authors across professions have also been ensured to guarantee representation, as the corpus contains work from playwrights, clerics, historians, and scientists.

The text metadata comes from various sources, derived from different databases covering a range of metadata including the title of the work, text date, word count, and genre classification. Sentences are taken from texts that are extremely different stylistically and follow varied conventions, as in conferences, legal texts, poetry, prayers, sermons, songs, speeches, scientific texts, etc. – The authors are categorised into religious, narrative, and 'other' authors according primarily to genre.

The author metadata is rich with sociolinguistic information including birth and death dates, political affiliation, religious proclivities, and social circles. The relationship networks between the EMMA authors are identified in two steps: How often did they meet in real life? How often did they cite each other? EMMA goes beyond establishing a biological or a geographical link to accommodate links between authors driven by interactions essentially invisible to us: the influence of friends on one's idiosyncrasies or shared linguistic practices across communities. The types of relationships, assessed from biography pages and their written work on EMMA, were assigned weightage and ranked. While the early and late generation authors did not demonstrate live connections due to the generation gap, the citation networks show that EMMA authors are all interrelated.

Sampling in EMMA could occur based on text-based sampling or author-based sampling. The former ensures that all authors are included such that the social structure of EMMA is retained. The latter serves those who are interested in lifespan change, for it is productive to retain the entire corpora of an individual. Since this text is concerned with the relationship between the individual and the community, and the effects of lifespan change, both samples were taken: a text-based selection to study prepositional passives and an author-based selection to study NCI.

In our opinion, the book has to be commended for lucidly laying out its descriptive and methodological goals and the research questions it seeks to address at the outset of what appears to be an ambitious endeavour. The author deserves credit for systematically addressing each of the research questions underlined in the introduction, over the course of the text. Whilst the initial

chapter may overwhelm the reader with its theoretical density, Anthonissen subsequently simplifies and exemplifies the issues at stake by. She assists the readers substantially by laying out the aims of each chapter in the beginning and concluding it with pertinent takeaways. She has attempted to tackle an extensive scope of inquiry, encompassing the interplay of individual and societal language change, and has delineated her methodology and findings with impressive lucidity.

Whilst the global questions have found interesting answers in the analysis of two special passives, they need substantial support through the investigation of related constructions before any broad generalisations can be made. But the findings outlined in this text offer a clear point of departure for broader research inquiry. Whilst conversational analysts may argue that only the written text has been investigated in this volume, there are bound to be promising research implications if this study becomes a model for analysing modern day real-time communication in everyday settings or across digital platforms. While the quantitative sections are simplified for the reader with highly structured tables and figures, the qualitative sections could be made richer with the exploration of other related linguistic patterns. Also, as the author points out, studying the ‘emergence’ of linguistic patterns can offer insights and supplement the textual analysis of the malleability of the same structures post-adolescence. These are, however, self-admitted limitations and are negligible in light of the larger attempt to refocus the study of linguistic change and correlate systemic macro-level change in the community to systemic social and cognitive changes at the level of the individual. Simply put, this book is necessary intellectual fodder for the student of linguistics curious about constructional change or any ardent reader interested in matters of language.

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Vulnerabilities, Challenges and Risks in Applied Linguistics
Clare Cunningham and Christopher J. Hall (eds) (2021)

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Reviewed by Eduardo Henriquez Diniz de Figueiredo and Kyria Finardi

The book *Vulnerabilities, Challenges and Risks in Applied Linguistics*, edited by Clare Cunningham and Christopher J. Hall and published in 2021, brings together chapters that centre around the notion of *risk* in Applied Linguistics. Having matured from a field that focuses mostly on issues of teaching methods (particularly in what pertains to TESOL), the book advances to address and problematise language issues at large in our contemporary world, as the discipline has done for the past decades. The book was first conceived at the 2018 Conference of the British Association for Applied Linguistics (BAAL) and includes chapters that were initially presented as papers at that conference as well as others that were added later.

The notion of risk is discussed from a number of perspectives and based on different accounts of what might be considered delicate, sensitive, uncertain, and often dangerous aspects of the work of applied linguists. Such aspects include, but are not limited to, issues related to ethics, working with vulnerable populations, emotional perils, and personal and professional pressures. Therefore, as the editors of the volume state in their introductory chapter, the idea of risk was not enough to encompass the complexities of the work in the field of applied linguistics and had to be complemented by what would be best conceived as *vulnerabilities* and *challenges*.

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In brief, risks are defined by Cunningham and Hall (p. 2) as ‘(a) the perceived or real probability of actions having unwanted or unintended outcomes or consequences; and (b) the perceived or real potential causes of these outcomes or consequences’. Vulnerabilities and challenges, in turn, are conceived as ‘susceptibility to harm’ (p. 2) and obstacles to achieving intended outcomes, respectively. As we delve into the chapters that constitute the four parts of the book (namely, ‘Communities’, ‘Policy’, ‘Research’, and ‘Education’), we realise that the risks, challenges, and vulnerabilities involved in the work of applied linguists are not only more numerous and complex than we might often anticipate but are also, and perhaps more importantly, frequently overlooked or superficially discussed.

Part 1 (‘Communities’) opens with a discussion of one of the most relevant matters in the field at this moment: how Southern epistemologies and Indigenous ontologies may challenge the centrality of Global North knowledges in our understanding(s) of language(s), linguistic practices, and ultimately applied linguistics as a whole (Severo and Makoni in Chapter 2). Through an analysis of Quilombism (a movement based on Afro-Brazilian slave descendants’ struggles and social organisations; see Nascimento, 1980) and Manguébit/Manguébeat, a cultural movement that unites Brazilian traditions with influences from global pop culture (see Diniz de Figueiredo, 2015), the authors build on previous discussions on the role of decoloniality in applied linguistics (Pennycook and Makoni, 2020) to suggest that if the discipline does not embrace Southern epistemologies and Indigenous ontologies, it runs the risk of reinforcing the injustices it seeks to oppose. The other chapters in this first part include discussions on the risks faced by Indigenous communities and by applied linguists who work with them, particularly in Latin American contexts (Murillo in Chapter 3), the challenges and emotional difficulties of campaigning for the recognition of sign language in Ireland (Conama, Chapter 4), and the problems that scholars who work with sexuality issues face, particularly the risk of being marginalised in their own professional contexts (Sauntson, Chapter 5).

In Part 2 (‘Policy’), the chapters bring to the fore issues that might go unnoticed in the design and implementation of legal guidelines and actions, even in contexts that are commonly perceived as very democratic and/or multilingual. Chapters 6 (Ennsér-Kananen and Saarinen) and 8 (Snoddon and Wilkinson), in particular, show that bilingual policies in Finland and Canada have often neglected minoritized languages in those contexts, mainly indigenous and sign languages, which often remain vulnerable and receive low social status. Chapter 7 by Lanvers, in turn, looks into the realities of the post-Brexit United Kingdom, highlighting that there is now a greater danger of that nation

becoming increasingly monolingual in English, despite ambitious initiatives by countries such as Scotland and Wales to move towards multilingualism. This danger, according to Lanvers, is related to factors like the perception of English being ‘enough’ for intercultural communication, and to a consistent lack of funding for multilingual initiatives. The chapters in this part of the book thus point to the risks that are faced by nations and communities even when supposedly well-intended policies (many of which try to encourage bi/multilingualism) are enacted.

The third part (‘Research’) considers risks that may often go unnoticed in our practices as scholars in Applied Linguistics. These include the emotional burden of addressing extremist discourses online (Barber, Chapter 9), how instructor-student relationships may affect how we generate and analyse data (Consoli, Chapter 10) and the challenges posed by interpretation practices when data is gathered from participants who do not share similar linguistic resources with us (Shaswar, chapter 11). These difficulties go beyond practical matters and include ethical and emotional dimensions that are part of our work but are sometimes either not reflected upon or simply ignored. Barber, for instance, explores the issue of whether she herself might be helping to disseminate extremist discourses by doing research that attempts to denounce them, all while having to grapple with the emotional toll that accessing extremist websites may take on her well-being (‘resilience’ is a word that is often used in her text). Consoli, in turn, asks the question of whether even humour (when used with student participants in a research project) might be considered a risk, depending on how it is used and for what reason. The challenges posed by Shaswar are equally complex because they relate to the interpersonal, intercultural, and interlinguistic relations that are part of research with newly arrived immigrants (something that needs to be considered not only by researchers but also by immigration agencies and other institutions that work with such immigrants).

Finally, Part 4 (Education) looks into the challenges, risks, and vulnerabilities facing educational practice in different parts of the world. For instance, Konstantinidou and Stadler (Chapter 12) present a detailed account of the construction of a new curriculum for a BA degree in Language and Integration in Switzerland. The authors present the careful planning that was done behind this construction and the limits that curriculum building entails, including the need for scholars to consider and scrutinise their ‘own positions and preconceptions as developers of a curriculum’ (p. 190). They go even further to ask whether the very term ‘Integration’ in the title of the new programme might bring challenges regarding how it is conceived and planned. Hepworth (Chapter 13) discusses the possible problems of addressing controversial issues in classes for

adult immigrants in the United Kingdom and argues that the benefits of bringing these issues to the classroom outweigh the risks, given the superdiverse nature of many of these classes. Still, the author discusses how the vulnerable positions many of these immigrants are in may place them at risk of being misunderstood and/or of experiencing discrimination beyond what they already suffer in their everyday contexts. In the final chapter (Chapter 14), Haidar poses the question of how access to English in Pakistan brings a risk for students from lower socioeconomic classes and ultimately for social integration within the country and argues that 'the ruling class uses the schooling system and consciously implements differential access to the English language to sustain their dominance' (p. 226). The study's findings resonate with arguments made in other parts of the world, particularly those in the Global South (see, for example, Finardi, 2014 for Brazil).

Overall, the book is a timely, relevant, and well-organised contribution to the field of Applied Linguistics since it delves into an area that has thus far not been explored enough. It has the potential to contribute not only to the work of novice scholars in the discipline, many of whom will benefit from reflections upon the risks involved in their research and future professions, but also to that of established scholars who may have already come across many of these risks in their own contexts while profiting from the opportunity to reflect upon others. The fact that the risks, challenges, and vulnerabilities in the volume are explored from a number of perspectives (i.e., socioeconomic, cultural, emotional, professional, amongst others), research contexts (e.g., sign language education, Indigenous studies, mainstream English Language Teaching, language minority education), and locations within the Global South and Global North certainly present a diverse range of possibilities for less and more experienced readers.

Notwithstanding the relevance of the contribution brought by the book, we feel that some other topics in our field could have been explored further. Issues such as language, race, and racism, for instance, are mentioned and somewhat discussed by some of the authors but could have had whole chapters devoted to them. Other topics, like translanguaging, language and internationalisation, and the COVID-19 pandemic, are less examined throughout the book and also merit analyses based on the notions of risk, challenges, and vulnerabilities. Still, mentioning of these issues is not a token of criticism towards the book – especially on account of it having been first conceived before the pandemic, not to mention the fact that no book can cover all the important topics of a given field. Rather, we mention these issues highlighting the relevance of the contribution of this book and as a way forward to advance the discussions in the field for

future volumes. We are confident that Cunningham, Hall, and the authors of the chapters in *Vulnerabilities, Challenges and Risks in Applied Linguistics* would like to see their work having influence in the ways presented here.

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***Diversifying Family Language Policy*
Lyn Wright and Christina Higgins (eds) (2022)**

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Reviewed by Piotr Romanowski

Traditional notions of family structure and settlement are no longer representative in the era of globalisation and superdiversity (Lanza, 2021). The dynamic political and economic conditions around the world, which constantly affect employment opportunities as well as access to economic, educational, and social capital, drive families to separation from the loved ones, frequent displacements, and cultural adjustments (Romanowski, 2021). They transform into transnational families whose experiences, rooted in frequent and intended translocations, entail complicated decisions about their children's language education, practices, and management (Romanowski, 2023). The volume titled *Diversifying Family Language Policy*, edited by Lyn Wright and Christina Higgins, published by Bloomsbury in 2022, contains stellar studies of how family life and language use unfold under different circumstances, in various geographical locations, and with a multiplicity of family structure configurations.

Divided into 15 chapters organised thematically into three parts, preceded by the introductory Chapter 1, this book approaches a few fundamental findings that will be highlighted in the present review. As indicated in the first chapter, the editors aim at setting the scene and explaining the motivation for their collection. This is where the editors provide a general overview of the volume as well as sketch its structure. As the editors have indicated, with their collection,

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they intend to expand the boundaries of current knowledge regarding Family Language Policy (henceforth, FLP). They skilfully achieve this aim by discussing diversity, the key term included in the volume title, from a wide range of different perspectives, i.e., diversifying family types, modalities, and methodologies, as well as languages and communities. Each ‘diversifying aspect’ provides an overview of studies showcased in the volume. With this type of structure, they pinpoint the main aspects of diversity the chapters will focus on; at the same time, they do not neglect past research into FLP by showing respect and appreciation for the first scholars and their seminal works which paved the way for our current knowledge of FLP, as a line of enquiry already investigated for more than two decades.

The first part, called ‘Diverse Families’, contains five chapters. In the second chapter by Lyn Wright, the focus is on a range of functions of kinship terms from negotiating interactions, achieving agency and power in family decision making and acknowledging kinship histories. The author concludes that kinship terms are crucial indicators of relations and processes existing in family communication and public discourses. The third chapter written by Mohammed Nofal and Corinne A. Seals presents the language practices of a New Zealand adoptive family. Based on the recordings of home interactional data, the study underscores the fact that parents often use language practices as acts of identity. The authors imply that, despite their efforts to connect the adopted child with her heritage culture and identity, the girl strategically resists it while denying other attachments. Kinga Kozminska and Zhu Hua, in Chapter 4, investigate the relatedness of FLP to legal and sociocultural changes in family definitions and configurations as well as child adoption with reference to a multilingual LGBTQ+ adoptive family. They argue that non-heteronormative masculine families reach intimacy and bonding through embodied sociolinguistic practices. The changes in family arrangements, mentioned by the authors, also highlight modern and advanced meanings of linguistic choices and language maintenance goals in the context of adoption, gender, and sexuality. Through the exploration of the so-called *kirogi* families, defined as split-household and transnational families in the Korean culture, Hakyoon Lee, in Chapter Five, provides valuable indications that we need more tangible institutional and community support for individuals and families. As outlined in the study, family interactions have been investigated to capture individual language use in Korean families where mothers leave for an English-speaking country with their children so that they can pursue education. In the sixth chapter, Christina Higgins shares some findings from her research into the relationship between *ohana*, a Hawaiian term that translates to ‘family’, and the Hawaiian language. Through the analysis of her

interview data, she reveals that the concept might refer to close connections between people who are not biologically related but share a worldview that prioritises Hawaiian knowledge, culture, and language.

‘Diverse Modalities’, which is the title of Part Two, consists of three chapters discussing other modes of family communication, namely, digital, multimodal and visual. Chapter 7 by Åsa Palviainen pertains to the analysis of ethnographic data collected through the FaceTime call routine between three participants managing three languages in their mediated family language practices. By applying the nexus analytical framework, the practices of these family members are explicated, shaped by the historical bodies, the interaction order, and the discourses in place. The authors of the eighth chapter, Sahra Abdullahi and Li Wei, problematise modes which Somali families in the United Kingdom have created to enhance communication despite language barriers, i.e., language brokering and embodied modality, to circumvent the lack of meaning or understanding while storytelling or completing other tasks. In Chapter 9, Maartje de Meulder, Annelies Kusters, and Jemina Napier focus on how the unconventional use of mixed methods, including visual methods, leads to insights into FLP in multilingual, deaf-hearing families and contributes to the development of FLP research methodology.

Part Three, titled ‘Diverse Speakers and Contexts’, includes six chapters, though the last one serves as a summary of all the chapters in the volume. The tenth chapter, written by Seyed Hadi Mirvahedi, Mojtaba Rajabi, and Khadijeh Aghaei, demonstrates how the integration of linguistic and non-linguistic factors furthers our understanding of FLP in the context of a minority language in Iran. The authors hope to trigger more research on the Turkmen community, especially in terms of the dynamics of language use in the families. In Chapter 11, Fatma Said depicts different constellations of Arabic-speaking multilingual families and their language ideologies through the prism of the complexity of Arabic language management impacted by the diglossic nature of the language, i.e., being the language of Islam as well as the language of the people. The twelfth chapter by Bong-Gi Sohn presents the findings of a study devoted to foreign mothers in Korea who, as spouses of Korean men, articulate a neoliberal ideology about their own language(s). The author illustrates how the first language of minority families is commodified under a highly gendered and instrumentalised state-led language policy. While multilingualism in South Africa is Indigenous rather than a consequence of transnational movement, Carolyn McKinney and Babalwayashe Molate explicate, in Chapter 13, that mobility within the country contributes to sustaining multilingualism, but monolingual competence in English still has a higher status. In Chapter 14, Marco Espinoza and Gillian Wigglesworth discuss families scarcely present in FLP literature

(indigenous communities in Chile) through a critical engagement with epistemological models aiming at universality when looking at localised language practices of multilingual families. The final chapter (15) offers an examination of implications resulting from diverse families, modalities, speakers, and contexts. Aurolyn Luykx, who published a study of family language policy and gender socialisation in bilingual Aymara households in 2003 and coined the name of the burgeoning field of FLP, examines how all the studies in the volume expand the notions of family, language and policy, all of which constitute points of connection within nation states, communities and households.

Overall, this book showcases a diversity of perspectives drawn from various contexts, offering critical and practical insights into current situations of Family Language Policy. It is exceptionally well edited and affords a great contribution to the field. The volume excels in setting and defining contexts in which each research study is embedded. Several perspectives, viewpoints, or definitions of the fundamental concepts have been provided across the chapters. Because this area of investigation is full of ideologies and political opinions, sensitivity is obviously required and this can in fact be found in this edited collection (Mirvahedi and Hosseini, 2023). That said, it is perhaps worthwhile to note that each author's bio has been placed on the first pages of this volume to contextualise the backgrounds they belong to. Further, it has to be clarified that this edited volume does not aspire to draw a general picture of the discussed topics, but rather, it offers small mosaic pieces originating from diverse contexts, using both quantitative, qualitative approach or case study design. In summary, the book convinces with stellar content and will certainly be an inspiration for scholars, students, and families.

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***Standards, Stigma, Surveillance: Raciolinguistic
Ideologies in England's Schools***
Ian Cushing (2022)

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Reviewed by Karen Forbes

Cushing's monograph represents a timely contribution to important discussions around language, power, and race among researchers and practitioners. Positioned at the nexus of language education, critical language policy, and raciolinguistics, the book offers new insights into how language ideologies (in particular, standardised English, and raciolinguistic ideologies) have contributed to the (re)production of social inequalities across primary and secondary schools in England. Through a wealth of powerful, real-world examples of national-level policies, local school policies, and individual perspectives, Cushing passionately argues against the deficit positioning of minoritised speakers in schools. While the focus is predominantly on the past decade, issues raised throughout the book are contextualised against the wider historical background of colonialism and, in response to this, teacher-led, antiracist movements.

Chapter 1, 'The Durability of Language Ideologies', opens with examples of overt language policing in a secondary school in London such as signs in the corridors listing 'banned' words and phrases under the guise of improving standards. Such explicit emphasis on 'standard English' is something which will certainly be familiar to any reader with experience of English primary and secondary schools. Here, Cushing sets out his aim to reframe such issues by exploring them through a raciolinguistic lens, drawing on related work conducted in the United States (e.g., Flores and Rosa, 2015), to demonstrate how such examples are used to maintain racial hierarchies in schools.

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Chapter 2, 'Language Policing: From Ideology to Inequality', provides a well-grounded overview of the key theoretical anchor points of the book. The work is clearly situated within critical language policy and, as such, considers policies related to language as a tool which can be used to sustain systems of inequality. Careful consideration is given to how such policies have been shaped by deeply ingrained ideologies which influence what is seen as 'proper' or 'valid' forms of language, namely: (a) standard language ideology, conceptualised here as a 'social and colonial construct' (p. 30) which serves the interests of the social elite (in this case, the white middle classes) and leads to the deficit positioning of those who use non-standard forms; and (b) raciolinguistic ideologies which work to structurally stigmatise the language practices of minoritised speakers. Schools are presented as key sites for enforcing and perpetuating the standardisation process and the central notion of 'sonic surveillance' (i.e., the policing and stigmatisation of nonstandardised speech and its speakers) is introduced.

Chapter 3, 'Tracing Language Ideologies', provides a useful overview of the methodological procedures used in the research which is grounded in raciolinguistic genealogy (Flores, 2021). It is refreshing to see such authentic reflection on the complexity and non-linearity of conducting such research in schools, balanced with the need to get 'inside the spaces where policy gets made, done and lived' (p. 64) to fully understand the multifaceted interactions between the various levels of policy. To this end, an overview is provided of the key sources of data collected; at the national level, this includes national curricula, government reports, school inspection reports, and standards for teachers. At the local level, this includes school policy documents from 264 primary schools and 321 secondary schools; and at the individual level, this includes interviews with 14 preservice and 14 in-service teachers. This is complemented by ethnographic work conducted in a secondary school in London.

Chapter 4, 'State-Level Mechanisms of Sonic Surveillance', focuses on national level educational policy forms in England since 2010 (which marks the start of the Conservative-Liberal Democrat coalition government, which was then followed by a majority Conservative government from 2015). Cushing argues that policymakers have failed to adequately recognise the rich linguistic diversity in schools by placing increasing emphasis on standardised English under the guise of raising standards. Indeed, an overview of key government documents evidences the increasingly deficit discourses around non-standardised English, where it is even mentioned at all. This is reminiscent of Flynn and Curdt-Christensen's (2018) analysis of post-2010 government policy in England in relation to children with English as an additional language. Here, the authors similarly note a lack of recognition or valuing of linguistic

diversity in government policies where any references to language are framed firmly within a monolingual (standard) English context. Cushing proceeds to critique other national-level mechanisms for ensuring the focus on standardised English such as an insistence on ‘correct’ standardised English in national tests, the requirement that teachers use ‘standard English’ in the classroom and the role of the inspectorate (pp. 11–117).

In Chapter 5, ‘Doing and Living Language Policy in Schools’, the focus shifts to institutional level language policy making and considers how schools enact policy within the wider national context outlined previously. Through analysis of written policy documents collated from over 550 schools in England, Cushing found that local policies largely reflected and reproduced the emphasis on ‘Standard English’ enshrined in national level policies. This is evidenced by extracts and concrete examples from these real-world policies accompanied by astute reflections on the underlying ideologies alongside the associated implications for students and teachers. However, while there is some acknowledgment of the frequency of certain terms across the corpus, I am also curious as to the prevalence of each of the main themes across the schools in the sample. The focus then shifts to poignant narratives from both preservice and in-service teachers – which brings to light their personal experiences of language policy and policing – of, for example, being publicly shamed by senior colleagues for their pronunciation of certain words. There are contributions from racialised teachers who felt pressured to ‘sound more white’ (p. 152) and from teachers with a strong regional accent who felt the ‘exhaustion’ (p. 150) of having to constantly adapt their language. This raises important questions not only about (perceptions of) legitimacy but also of identity in terms of how these teachers position themselves and are positioned by others in the school setting.

The focus of Chapter 6, ‘Bad Behaviour, Bad Bodies, Bad Language’ shifts from a more general overview of institutional policies to an in-depth exploration of language policies and policy enactment in a strict secondary school in London. Here, Cushing explores how standard language and raciolinguistic ideologies intersect with notions of discipline and behaviour (both presented as forms of racialised policing). He uses examples of policies and pedagogical practices in the school as a springboard for reflecting critically on the rationale behind key debates and trends in education and their implications for racialised students, such as approaches stemming from studies on the ‘word gap’ between students from different socioeconomic and demographic backgrounds upon starting school (pp. 178–184). These ‘word gap’ studies are often based on the premise that students from low-income backgrounds hear up to 30 million fewer words than their high-income peers before starting school. This has led to the

language of these students being found deficient and ‘in need of correction’ (p. 197). Yet this is contrasted with real-world examples of non-standard language being used creatively by students as a way to engage fully with the content and relate to it at a more personal level.

As noted by the author in the introduction, while the first six chapters focus on struggle, Chapter 7 focuses on hope (conceptualised as raciolinguistic resistance). It begins with a historical overview of teacher-led, antiracist movements in the United Kingdom and then presents a case study co-led by a teacher in a London secondary school centred on using literary texts as a tool to enable students and teachers to critically explore issues of language, power, and race. While making a strong case that ‘teachers should see themselves as language activists’ (p. 217), Cushing also acknowledges the broader, national-level policy constraints within which teachers have to operate. The case study presented, therefore, provides useful, concrete examples of how teachers might begin to engage in antiracist language work based around the development of raciolinguistic literacies in a more grassroots manner. As such, this section of the book has practical implications for classroom practitioners, in particular, teachers of English. And, while the dominant focus of the book as a whole is, understandably, on (standardised) English, the case study presented in Chapter 7 also highlights the importance of creating space for students to reflect on and draw on their full linguistic repertoire. Given that over 20% of students in state-funded schools in England are now recorded as speaking a language other than English in the home (Department for Education, 2023), this increasing linguistic diversity in schools (and the associated implications for how these students position themselves and are positioned by others through language) cannot be ignored.

Overall, *Standards, Stigma, Surveillance: Raciolinguistic Ideologies in England's Schools* is an engaging yet unsettling read. Cushing does not shy away from challenging the structures and practices which (re)produce linguistic discrimination in schools, yet he also offers some practical suggestions for a way forward, whether that be through a review of local, school-level policies, through teacher training and continuing professional development, or through individual teachers creating a space in their own classrooms to critique issues of language and race. Although much of the evidence presented in the book is drawn from schools in London, the key messages undoubtedly have relevance across the country and, indeed, internationally. There is also scope to broaden out the focus here beyond the use of (standard) English and to further consider implications for the use (or not) of languages other than English in schools.

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***Choreographies of Multilingualism: Writing and Language
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Reviewed by Jaspal Naveel Singh

T. K. Lee's new book breaks new grounds in the sociolinguistic study of writing, urban multilingualism, translation, and semiotic landscapes. Teeming with theoretically sophisticated and empirically grounded arguments, written in a crisp and accessible way, the book traces how various official and grassroots actors choreograph multilingual writing in Singapore; i.e., how they performatively stage diverse linguistic resources to create specific semiotic and social effects. Lee thinks of multilingual choreography as 'a semiotic representation involving the nonspontaneous configuration and display of language in texts, pointing to their power relations against a specific sociolinguistic milieu' (p. 17). A native of the Lion City himself, Lee takes the reader through different scenarios in which languages come to be choreographed: for example, multilingual signage in public spaces, literary translation practices, metadiscursive folk linguistics, vernacular resistance poetry online, or translingual subversive writing on T-shirts. While the metaphor of choreography is loosely alluded to across the chapters, in my reading it remains slightly underdeveloped. There may be interesting interdisciplinary links to be made between choreographies of multilingualism and the movement poetics of writing (Alsopp, 2015), or indeed – less metaphorically – the linguistics of dance (e.g., Maiorani, 2021). Despite missing such opportunities, Lee's monograph presents us with a rigorous, multisited, and innovative analysis of writing in multilingual Singapore.

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The structure of the book is inspired by Michel de Certeau's spatial theory, which distinguishes between top-down institutional strategies of creating order, resulting in a structured and permanent *place* on the one hand and bottom-up everyday tactics of usage and resistance that order on the other, thereby turning place into a transient and mobile *space*. Chapters 2 and 3 discuss how the state and official actors deploy multilingual resources strategically to choreograph Singapore as a neat multilingual place. In Chapter 2, Lee presents examples from official public signage where the four official languages of Singapore, namely, English, Chinese (i.e., Mandarin), Malay, and Tamil (ECMT), are choreographed in a more or less semiotically symmetrical way. On the surface, the quadrilingual schema announces an affective regime of balance (p. 57) between Singapore's four official languages, which is meant to index harmony between Singapore's colonially inherited ethnic population categories, namely Chinese, Malay, Indian, and Others (CMIO). Upon closer inspection, though, English is often privileged in terms of its geosemiotic placement and salience on the signage. This constructs English not only as an 'ethnically "neutral" language delinked from any particular category under the CMIO rubric' (p. 32), but it also renders English as a point of reference on which the other three official languages depend, relegating them to the status of non-autonomous languages (p. 51). Chapter 3 analyses translation practices in a corpus of government-funded literary anthologies published between the 1980s and 2010s. Lee initially identifies two main models of translation practices. First, in the model of triple bilingualism, typical of the 1980s and 1990s, literature published in one of the official languages is translated to English only, giving rise to asymmetrical multilingualism. Second, multilateral translations, typical of the 2000s, occurs when works in each of the four languages are translated into the other three, giving rise to immaculate symmetry. Lee observes several other forms of translation models in the chapter, such as nontranslation and multimodal translation. What many of these official choreographies of multilingualism presented in these two chapters have in common is that they enregister the four languages of Singapore as ideologically legitimate and fixed official codes indexing Singaporeanness. However, this enregisterment also erases regional and social dialects of these languages, such as colloquial Malay and the various Chinese dialects like Cantonese, Hakka, Hokkien, Teochew, and Hainanese, which are spoken as mother tongues by many Chinese Singaporeans, as well as Singlish, the urban heteroglossic vernacular of the common Singaporeans that blends features of English with various local language features in creative and ludic ways.

Chapters 4 and 5 shift perspective and analyse the bottom-up multilingual resistance tactics with which citizens can articulate a counter-discourse that

celebrates heteroglossia and playful semiotic transgressions, thereby rendering Singapore a multilingual space. Chapter 4 analyses folk lexicography and metadiscursive commentaries of Singlish. Lee focuses his analysis on the 2018 popular book titled *Spiaking Singlish: A Companion to How Singaporeans Communicate* by Gwee Li Sui, which presents itself as a quasi-academic linguistic piece of writing. The book, however, doesn't aim to be descriptively accurate or even teach non-Singlish speakers how to communicate in Singlish; rather, its aim is to ludify (render playful) English. This is achieved by writing the book largely in Singlish and thereby misaligning the vernacular with sophistication and education. Lee notes that 'the recursiveness involved in explaining Singlish in Singlish creates a self-sufficient, endonormative loop that results in locale- and register-specific linguistic entertainment, spurring laughter for the "in-group" Singlish speakers "in the know"' (p. 107). The book can thus be considered a bottom-up folk-linguistic resistance strategy that contests official top-down neat multilingualism and in particular resists the government's official Speak Good English Movement, a language planning intervention that promotes verbal hygiene (Cameron, 1995) by discouraging the use of Singlish and encouraging the use of a more internationally understandable variety of English for the sake of further establishing Singapore as a global city and important hub of international trade. Lee continues the chapter by tracing an online counter-discourse, namely the Speak Good Singlish Movement, which intends to valorise Singlish by facilitating metalinguistic citizen sociolinguistic (Rymes and Smail, 2021) commentary online. In Chapter 5, Lee takes readers into the world of citizen poetry online. He shows how a new generation of Singaporean poets harness the disruptive potential of heteroglossia to enregister Singlish into a poetic language that can resist the state's neat multilingualism and verbal hygiene utopias to make space for a vernacular grassroots ethos in poetry and literature.

Chapter 6 goes beyond de Certeau's divide between the state's top-down strategy (place) vs the people's bottom-up tactics (space) to shed light on the entanglements between the two discourses to propose that writing in Singapore is moving towards post-multilingualism, an idea originally articulated by Li Wei. Post-multilingualism is 'a more general orientation to the ludic in ordinary communication, with a premium on creative moments rather than systematic choreographies' (p. 211). To make the argument, Lee uses Edward Said's idea of contrapuntal narratives. In this view, the vernacular tactic of space is always articulated in disharmonious relation to the official strategy of place, and the official strategy also always implicates the vernacular by suppressing it and erasing it. Each of the two narratives, while relying on the other, retains

its own logic and develops partly independent of the other. Yet, Lee warns us, perhaps justifiably so, that this contrapuntal view runs the risk of essentialising the two discourses and romantically valorising the vernacular resistance while condemning the official order. It remains unclear, though, how the idea of post-multilingualism, with its emphasis on ludifying the ordinary and creativity, can help us escape such romanticisation of the vernacular. In my reading, Lee's announcement of post-multilingualism suggests a victory of citizen sociolinguists' resistance tactics over the state's strategies of imposing order. In any case, Chapter 6 treats readers to diverse examples that show how the official and vernacular visions of multilingualism become entangled in complex ways. On the one hand, both the state and private companies can appropriate the vernacular. For example, the Ministry of Health commissioned the production of a Singlish rap song to ludically inform Singaporeans about correct behaviour in public during the SARS epidemic. On the other hand, creative designers produce T-shirts that bear writing in Singlish, colloquial Malay, and Chinese dialects in the official quadrilingual formula of neat multilingualism, to offer a playful critique of verbal hygiene. The humour and playfulness of these T-shirts is cleverly hidden behind translanguaging and translational practices that are only accessible to the in-group of Singaporean citizen sociolinguists.

Lee's sophisticated analyses of official and vernacular choreographies of multilingualism in Singapore will help sociolinguists, citizen sociolinguists, language planners, writers, poets, designers, and all language users interested in the vernacular to understand what is at stake, both semiotically and politically, when writing in and across multiple languages. Can Singapore's long and rich history of multilingualism (it is so long, indeed, that Lee announces a post-multilingual Singapore), help us anticipate what will happen in other urban spaces where we find similar multilingual writing practices, such as Hong Kong, Delhi, or New York City? What kinds of choreographies of multilingualism can we find in smaller towns and rural places across the world? How will the participatory web and the latest developments in artificial intelligence further shape choreographies of multilingualism in the future? It is certain that readers of Lee's compelling book will be prompted to ask many such questions and that this will inspire future sociolinguistic research into multilingualism, writing, semiotic landscapes, and translation.

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***Global CLIL: Critical, Ethnographic and Language
Policy Perspectives*
Eva Codó (ed.) (2023)**

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Reviewed by Elisa Hidalgo McCabe

Content and Language Integrated Learning (CLIL) is a term used to describe forms of bilingual education where an additional language is used as the means of instruction in nonlanguage school subjects. From its inception in the 1990s, the accelerated development of CLIL is due to the strong influence of national and supranational policies (e.g., European Commission, 1995), contributing to its positioning as the cornerstone of contemporary multilingual education in Europe: CLIL is considered to be an indispensable means by which mainstream schools can ‘foster their students’ bilingual and multilingual skills’ (Nikula, 2017: 112). Throughout the early years of the 21st century, the ‘CLIL movement’ (Ludbrock, 2008) became associated with a glorifying and egalitarian rhetoric whilst its assumed goodness remained entrenched – and unchallenged – in its essence and workings (Van de Craen and Surmount, 2017). This volume, edited by Eva Codó, aims to expand the boundaries of existing CLIL scholarship, making the case for a socially anchored examination that highlights the value of critical, ethnographic, and language policy perspectives. At the same time, the volume addresses CLIL’s global dimension by drawing on examples not only in Europe but also in Latin America, Australia, and Asia. This timely publication foregrounds avenues for critical research on CLIL by reexamining its complex significance beyond the notion of approach or method for improving language learning. As the editor points out, CLIL is ‘a policy, a form of practice, an ideology, a brand, a social process, an ethos and a moral order’ (p. 7).

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In the introduction, Eva Codó, the editor, situates CLIL on four fronts – historical, political, ideological, and scientific – and advances the organisation of the volume, which consists of a further eight chapters that are divided into two parts: ‘Localisations of CLIL Outside Europe’ and ‘Lived Experiences of CLIL: A Focus on Actors’. The first part centres on local and localised appropriations of CLIL in four distinct non-European contexts of CLIL policy and implementation. The second part examines the lived experiences of CLIL actors. The book ends with an afterword by Miguel Pérez-Milans, who brings together its argumentative threads and provides vistas of the future of CLIL-related work for researchers and practitioners.

In Chapter 2, ‘Exploring European CLIL to India: Flexible Appropriations for Complex Language Debates’, Relaño Pastor and McDaid situate language learning politically and ideologically by turning an ethnographic lens on the EU-funded CLIL@India project, which began in 2016 and ended in 2019. In the hasty adoption and adaptation of CLIL to a complex multilingual ethos where language-in-education choices appear to remain unresolved, the correlation of this approach with a modernised and global agenda intersects with ‘historic, socio-economic, political and sociolinguistic conditions of late modernity in India’ (p. 28). The voices of teachers and coordinators involved in CLIL@India, as well as the materials drawn from the project’s website, reveal what CLIL is able to do for each school context (or not) (p. 47).

In the chapter ‘Situated Emergence of CLIL: New Discourses of Bilingual Education in Australian Government Schools’, Smala investigates the interplay between class, school choice and CLIL programmes. Following an overview of the history of bilingual education in Australia, she describes and analyses how CLIL and bilingual government school programmes have become an attractive option for parents whereby academic excellence and selection are conceived as a ‘pull factor’ for school choice. The author centres on the Australian state of Queensland, which serves as an illustrative case of ‘the dichotomy between private and government schooling’ (p. 67). Drawing on Ball (2003), Smala addresses the class-based narratives guiding global citizenship aspirations of parents in connection with bilingual education programmes.

In Chapter 4, ‘CLIL and the Dynamic of Policy and Sectorialisation in Colombia’, Anderson, Cuesta Medina, Dene David, and McDougald analyse the uptake of CLIL in Colombia resulting from the private sector’s dependence on the publishing market. The chapter explores issues of language education, bilingual education, and CLIL from the perspective of the Global South and contextualises the situation of (language) education in Colombia. The experiences and perceptions of educators and publishers reveal the familiarity of the CLIL term

among the country's private sector alongside its recognised status as 'even better than traditional bilingual education' (p. 87). Moreover, CLIL is perceived as necessarily costly to implement and is associated with 'already advanced users of the additional language of instruction' (ibid), a view that clashes with a social justice agenda on behalf of CLIL's founding proponents.

Pérez and Unamuno centre their study on a very different Latin American context in the chapter 'The challenges of integrating linguistic and disciplinary knowledge in public secondary schools in the province of Córdoba, Argentina'. Following a multi-level approach that draws on a variety of relevant theoretical and methodological lines of research, the authors focus on the ways in which content and language integration occur. Through the specific analysis of coteaching at a public secondary school, the authors explore the integration of linguistic and disciplinary knowledge from a triple perspective involving 'public policies, educational institutions and classroom practices' (p. 97). Specific attention is paid to the negotiation of roles and languages as well as to how teachers position themselves in the interdisciplinary conversation.

Chapter 6, 'Policy, Practice and Agency: Making CLIL Work? Insights from Austrian Upper Secondary Technical Education', moves the focus to Austrian upper secondary colleges of technology. Working in a period that shifted from voluntary to obligatory CLIL programmes, Hüttner and Smit probe the extent to which students attending these colleges see the CLIL programme 'as a struggle, as a success or something in between' (p. 130). Drawing on Sposky's (2004, 2009) extended language policy model, the authors centre their study on learner cognitions to illuminate how they navigate the demands of CLIL. Their analysis of focus group interviews reveals that, despite an overall acceptance of CLIL as 'just one more part of schooling' (p. 134), students expect and demand that its implementation take into consideration their needs, especially when it comes to balancing out 'the challenges of using English as a medium of instruction' (p. 143). By way of constructing their agency as indirect, students navigate an in-between position that seems to allow for CLIL to be constructed as a success (p. 144).

In Chapter 7, 'English and the Life Projects of Youth in Contemporary Spain', Patiño-Santos and Poveda take a social class perspective in their investigation of the experience with English language education – including CLIL – of young people in Spain's autonomous regions of Catalonia and Castilla-La Mancha. Drawing on a politico-economic (Block, Gray, and Holborow, 2012) as well as an ethnographic approach to CLIL, the authors focus on showing the experiences of students from diverse socioeconomic backgrounds with CLIL-type programmes and the ways in which English 'is articulated in their accounts of

their past, present and future lives' (p. 152). In particular, the chapter discusses the emerging neoliberal selves and how future aspirations are linked to 'material symbolic conditions' (p. 151) reported in students' biographies and experiences regarding the interconnected dimensions – language learning trajectories, out-of-school uses of English and future expectations (p. 156).

Chapter 8, 'Language Teachers: CLIL and the Politics of Precarisation in Catalonia', examines educators' lived experience of CLIL in state schooling in the Catalan context. Following a historical account of CLIL and the politics of language in this region, as well as an overview of the Catalan school system, Codó examines CLIL implementation in two schools located in the Barcelona metropolitan area. The focus of the chapter highlights the view of CLIL as a site of struggle (Darvin, Lo, and Lin, 2020) and profoundly dilemmatic (Codó, 2022), as occurs with any educational policy. The ethnography employed shows the ways in which CLIL impacts the teaching body by establishing new hierarchies and exacerbating existing ones. As the author points out, the 'official urge' (p. 192) to expand CLIL is problematic for the equity of the state school system as it thrives on the precarisation of a significant proportion of the Catalan teaching workforce.

In Chapter 9, Giampapa and Fernández Barrera investigate the processes of 'being and becoming' (Giampapa, 2004) a CLIL teacher against the backdrop of language in education policies and educational shifts in Castilla-La Mancha, Spain. The authors explore the ways in which CLIL teachers' identities 'shape their sense of selves and positioning as professionals' (p. 199) in relation to their past and present histories as well as future aspirations, including imagined identities. Their analysis of interview data serves to provide an account of how these identities are 'discursively politicised' (p. 219) within the *status quo* of educational institutions. The two cases of teachers interviewed exemplify the process of 'negotiating, managing and resisting' (p. 219) their social, linguistic, and gendered identities.

Essentially, this volume contributes to a much-needed critical lens on CLIL as a global phenomenon. It lays the epistemological groundings that foreground the value of in-depth explorations of CLIL policy and implementation in different educational contexts. If any criticism can be made of the volume, it is that it could have paid greater attention to content and language integration from the perspective of classroom practice to further explore how disciplinary regimes interact with educational praxis (but see Chapter 5). All in all, this publication is inspiring for language-in-education researchers as well as those already in the field who wish to make visible the links between CLIL and inequality by paying special attention to actors, issues, and processes overlooked in CLIL scholarship.

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***Multilingualism and Gendered Immigrant Identity:
Perspectives from Catalonia***
Farah Ali (2023)

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Reviewed by Ignacio Andrés Soria

How is language interwoven with Muslim identity and the gender mandate in a diasporic context where sociolinguistic relations diverge between the linguistic communities involved? This is one of the pivotal questions guiding the research of Farah Ali. From an emic point of view and based on the intersection between gender and religion, she explores linguistic practices and the roles of language in the social dynamics of minority linguistic communities in a multilingual setting such as Catalonia. To do so, she relies on the interpretation of data obtained in her fieldwork with first- and second-generation Muslim migrant women living in Barcelona. The volume encompasses 176 pages. In nine chapters, the author represents the architecture of a sociolinguistic study focusing on linguistic attitudes linked to the processes of racialisation, gendering, and migration. Although fields of study such as migration linguistics (Zimmerman and Morgenthaler, 2007; Estévez Grossi, 2018; Gugenberger, 2018) are promoting research focused on exploring the social values acquired by languages in diasporic contexts, there is a notable absence of sociolinguistic approaches that address the role played by language at the intersection of gender and religion. In this research, the comparative approach between the first and second generation of informants acquires a special relevance in addressing explanations

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of assimilation processes and gender mandates, aspects that are particularly evident through the presentation of qualitative data (narratives, Chapters 5 and 6) combined in triangulation with quantitative data (a sociolinguistic questionnaire, Chapter 7). The results are used on the one hand to elaborate some of the implications of the intersectional study of the language-migration matrix (Chapter 8) and to call for language and migration policies in Catalonia (Chapter 9) that consider the linguistic dimension of migrant experiences and the relations between language communities on the other.

After an introductory section, Chapter 2 deals with a review of the territorial, sociopolitical, historical, and sociolinguistic spaces in which the study is grounded. Drawing on various studies, Ali presents Catalonia as a diverse territory where the values assigned to the multiple languages involved in the study – especially Spanish, Catalan, and migrant languages – are ascribed to sociopolitical developments, with the Franco dictatorship as the starting point. The consequent language policy is also considered a historical factor that, at least partially, index the current understanding of Catalonia as a contested political-linguistic territory. The author reviews how, through the ideological openness that followed the transition to democracy, Catalan was shaped as the language of Catalan identity, an aspect that sustains the development of a set of inequalities linked to the construction of whiteness. Catalan migration policies represent a subsequent level of linguistic policy that is also reviewed to account for the existing imbalance in integration processes (cf. Flubacher, Coray, and Duchêne, 2016). In the last section, the author reviews the studies focused on the analysis of the language-migration matrix in the context of the Muslim and Moroccan community in Spain. Ali foregrounds critical studies on language heritage programmes, and she accounts for the need to consider linguistic attitudes as elements that are crucial for motivation in language maintenance processes. In this context, she asserts gender differences in describing the reasons why the Arabic language is maintained in the context of family and community cohesion. She refers to logics such as the *good Muslim* or the *need for linguistic transmission* emerging in the case of men and women respectively. The latter aspect is corroborated by female informants in her research.

In the third chapter, the author presents a synthesis of the theoretical framework based on the concepts of acculturation, migrant identity, language learning, language investment, and intersectionality. Specific research on Muslim women remains a desideratum, so she presents a summary of studies that deal with similar contexts. In this direction, she focuses on language maintenance processes and on the acquisition of the Spanish and Catalan languages considering the state of the art about internal migrants (namely, Andalusians migrating

to Catalonia) or Latin American migration in Spain. Therefore, she reviews research into the values associated with each language, from the perspective of attitudes and linguistic ideologies. She develops descriptive and critical approaches to the acculturation model and delves into the ideology of linguistic investment. This ideology is of special interest for the analysis of the context of gendered identities, such as that of migrant women, who are often responsible for the intergenerational transmission of the heritage language as well as being those who consider the incorporation of the target language to repertoire as an added value. The last section of the chapter serves to elaborate the relationship between the discourse and the participation of the target language community in the construction of identity. The author makes explicit the ways in which the attitudes and discursive constructions of the target language communities influence the linguistic practices of the heritage language communities.

Chapter 4 deals with methodological reflection. Two critical aspects should be highlighted. First, the researcher is aware of a process of homogenisation in the selection of participants through the category of *Islamic culture* that is interwoven with gender identity. While the informants have different origins (Morocco and Pakistan among others), the researcher assumes that there are common practices that can inform religious interaction. Second, she also stresses the complexity of working in contexts of migration, which is perceived in the difficulty of categorising people who do not fit into the age categories that sociolinguistics has incorporated so far, such as the question of first and second generation. Although Ali assumes the existence of a generation 1.5 (made up of those who migrated when they were young and who would not formally correspond to the first or second generation), for reasons of linguistic competence and methodological necessity they are assimilated to the second generation. Both questions are of interest for the continuation of disciplinary discussions on methodological treatment and categorisation processes.

The fifth chapter deals with the presentation of narratives. The author divides it into three parts that deal with the relationships that the first-generation female informants maintain with the target language community and the heritage language community respectively. She discusses the social meanings that emerge from the speakers' attitudes towards Spanish, Catalan, the heritage languages, and English. The first part of this chapter, 'Connections to the Target Language Community: Navigating with Catalan, Spanish and Other Local Languages', reports that Spanish is prioritised as a vehicular language among new migrants and linked to integration processes (p. 58). Informants refer to the future of their children as a mobilising object of language choices, for example, in relation to learning Catalan (p. 60). Linguistic processes of differentiation between the

target language community and the heritage language community provide information about the construction of an endo- and exogroup (p. 61). With regard to attitudes towards language learning, some informants mention the initial difficulties in this diasporic context in relation to the language barrier as well as the motivation in language learning linked to prestige, with English also intervening alongside Catalan (p. 61). She also looks at perceptions of the target language community's favourable attitudes towards migrants (p. 63), and how these are particularised in their own language attitudes. One example is the mirror effect (cf. Cortès-Colomé, Barrieras, and Comellas, 2016) that occurs between Catalan and the heritage language (Tamazigh), allowing migrants to draw parallels in the linguistic relations of minorisation between their country of origin and Catalonia, thereby promoting bidirectional favourable linguistic attitudes towards Catalan and towards migrant languages (p. 64).

The second part of the monograph, titled 'The Role of Linguistic and Cultural Differences', focuses on two types of narratives: the narratives of distancing from the target language community and those of differentiated interaction between target language and heritage language communities. Distancing is based on values and practices, as well as on clashes between gendered/religious identities and Catalan/Spanish identities. For example, the informants report indifference to target language learning and also expose narratives of resistance to learning Catalan, an aspect based on the construction of Spanish as a vehicular language and the reported limiting communication value of Catalan. In the interaction, participants inform the ease of accommodation and the absence of social problems between the use of Spanish and Catalan and report the own predominance of Catalan listening competence over Catalan speaking competence (p. 67). Resistance is also linked to disconnection stemming from a feeling of partial integration, for example, professionally but not socially. At other times, disconnection is underpinned by cultural differences and linked to ideological racism that affects women in an association with religious values (p. 68). Here, Ali alludes to gendering practices that position women as outsiders, an encouraging direction of research to be linked with sociolinguistic decolonial studies about the white gaze, such as the raciolinguistics perspective (Flores and Rosa, 2017). The participants also report on feelings of linguistic insecurity that point to the ideology of native competence (p. 65). To a lesser extent, references are made to cultural incompatibility, such as pointing to negative attitudes towards Arabic and other languages.

In the last part, 'Connections to Immigrant Communities', the author starts from the idea that social and cultural relations within and between the two communities are factors that explain linguistic behaviour as it has been studied

in other intersections such as gender, where beliefs about gendered linguistic behaviour are to be explained by existing beliefs about men and women (Cameron, 2007). Some informants report that they link to and recognise themselves in the Barcelona space but only through their connection with Pakistani women, a perception which interacts with dynamics of disconnection with the target language community. It also illustrates how gendered identity linked to interlocutors' heritage identity influences interaction. Thus, informants allude to the difference in interaction between themselves and men, reporting the formality and social distance necessary for communication with non-Spanish/Catalan men (p. 71). This aspect is reinforced by examples from Morocco and Spain that point to the linguistic mandate of gender and the situationality of linguistic interaction. Furthermore, narratives give information about the distancing from the heritage language community due to issues of origin and cultural difference (p. 75). She also notes the constructed differences between groups – particularly Moroccans and Arabs – and the perceived impositions by the majority one, which could be further explored in a research direction relevant to the discipline.

Chapter 6 aims to present the narratives of second-generation speakers. The author highlights the strong connections between language, home, and parents as well as certain senses of community and cultural heritage (p. 81) that point to the binomial construction of an ingroup and outgroup. She further refers to forms of lived language experience (Busch, 2017) in which connections to the heritage language community are less intense. This is presented through comparisons between identities, critiques of parents' failure to adapt, intergenerational contrasts in the understanding of interactional practices, and the analysis of the incorporation of culturally situated gender mandates throughout maturity and growth (p. 89). Furthermore, Ali addresses the role attributed to Catalan, reporting its connection to the institutional level, and highlights the paradox experienced by participants when they report belonging to the target language community. She also describes how the informants feel othered by accents or assessments of which languages should be spoken and incorporated into their own linguistic repertoires. These situations indicate the mandates of the ideal migrant and integration, as well as the underlying ideology of *one language, one nation*, and, of course, a racist understanding of the linguistic dimension of the migrant condition. All aspects allow us to observe how linguistic ideologies are reconstructed in interaction and how they are activated by semiotic and religious symbols, such as the *hijab*, observed in this context. Additionally, more favourable attitudes are presented, showing a possible generational change in the way of understanding linguistic heritage and processes of cultural appropriation (p. 97). Finally, in a fourth section, Ali argues that the idea that heritage culture is

not understood as part of the target language culture. To illustrate this aspect, she synthesises some of the considerations reported by participants in relation to the experience of the two cultural identities, for example, not fitting properly into one or the other or living at home in one way and living in the street in another.

In the following chapter, the researcher presents the quantitative data analysis of both generations' language attitudes. She draws on three research tools included in the sociolinguistic questionnaire: a test of communicative domains, a Likert scale on attitudes based on nine statements, and a test of ideal speaker traits. She also intersects, as far as possible, with social variables such as marital, parental, and employment status, as well as educational level, and tries to avoid overlaps and is aware of the limits of the study. While highlighting the intergenerational comparison, a complementary thematic description of the analysis would possibly have been helpful for triangulation purposes. Through the domain analysis, Ali notes a higher degree of assimilation in the second generation which she describes alongside the parallel maintenance of the heritage language. The author realises that these informants participate in multilingual communities and that they do not ascribe a language to a particular domain of use. The analysis of the traits associated with an ideal speaker stands out for pointing out that Catalan is less used than Spanish and is more favoured by the second generation. The researcher confirms results from previous literature: for example, the first generation has more positive attitudes towards Spanish than towards Catalan (Pujolar, 2007), which also fits with the higher level of exposure to Spanish which she has also observed. Spanish and Catalan are associated with the language of status for this generation through the ascription of traits such as rich, literate, and prestigious. In contrast, the first generation does not categorise languages uniformly. While they do not have unfavourable attitudes, they do not observe Catalan as an advantageous language (p. 121). Catalan, which is shaped in association with an ingroup, is also notable for its limited access since informants, as non-Spanish speakers (migrants), are not expected to speak Catalan. In the second generation, there is a process of othering, and in general, the author claims that Catalan is construed as a language that is more exclusionary than inclusive (p. 121). Heritage languages are used on a daily basis with favourable attitudes, linked to cultural heritage and understood as languages of solidarity by traits such as religious and pure. The first generation uses them more than the second generation, especially in writings. They are linked to the family context and the home environment, for example, through parental responsibility for passing on the language. Finally, Ali raises the hypothesis that there may be an extension, especially marked in the second generation of the values associated with Spanish and Catalan, whereby the heritage languages

would begin to share the value spheres with the languages of the target language community, an aspect that should be investigated in greater depth to analyse the value development of the migrant languages.

Chapter 8, titled ‘Implications for sociolinguistic research’, highlights the need to observe how informants’ linguistic attitudes may be influenced by the target language community’s attitudes towards heritage language communities. Furthermore, it points out that bilingual contexts have specificities with respect to monolingual contexts that affect the experiences of acculturation processes. In this case, acculturation involves acquiring social multilingualism – Spanish and Catalan – and it must be considered that informants of both generations maintain different relations with the two languages. Moreover, it is contemplated that, in this case, educational institutions guide socialisation, practice and therefore attitudes. Two more aspects stand out: first, the set of situations of linguistic violence that occur after being read as migrants; and, second, the ways in which prestige and pragmatism linked to Spanish serve the reification of migrants, through their essentialisation and othering, reinforcing the exclusivity of Catalan language.

Finally, Chapter 9 deals with the ‘Implications for Language and Immigrant-Targeted Policies’, offering a set of proposals and demands aimed at realigning language policy with reality. This would imply taking into account the migrant issue and the results of the research, making it explicit, for example, that Catalan is not a vehicular language for the first generations and demanding a broad language policy for Catalan to break with ideological ambiguity and build a non-exclusive Catalan by means of the de-ethnicisation of the language. The researcher also calls for a recognition of heritage languages and languages with a historical trajectory in Spain such as Arabic. Additionally, an opening of the educational system and the recognition of international languages useful in migratory contexts are also suitable aspects that would be operationalised from a *linguistic pluralism* perspective to attend to gender specificities rethinking linguistic access and permitting social integration as a bidirectional process influenced by a multilingual reality.

Sociolinguistic research like Ali’s is especially valuable in the current scenario with the rise of the radical right-wing political parties and the strengthening of anti-Muslim hate speech in Europe (see Mudde, 2007; Polo-Artal, 2022). Addressing the gender-religion intersection through the observation of language becomes a courageous and necessary political act of resistance. The author brings in sociolinguistics by broadening the research directions of frequently othered communities and individuals. At the same time, she reenacts the intersectional approach as a suitable sociolinguistic method for observing how

gendered and religious diasporic identities inform language uses in multilingual contexts. Future analyses in this research direction would be complemented by addressing the relationships between linguistic attitudes and ideologies in greater depth, by attending to the variable of origin, or by including other genders in the elicitation of data. Additionally, the effectiveness of the comparative approach between generations as a method of clarifying the social change of language in diasporic contexts stands out. As demonstrated, this study is a valuable contribution to the description of the interwoven identity phenomena within current multilingual contexts consolidating linguistic attitudes as essential analytical axes to address present and future challenges.

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