

Historiography of the Formosan Languages since 1990

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4.1 Introduction

In his seminal paper on the grammatical typology of Formosan languages, Stanley Starosta (1988) urged linguistics students in Taiwan to engage in the study of Formosan languages: "Austronesian scholars throughout the world are waiting with baited breath for news about the [Formosan] languages, but unless they speak Chinese or Japanese and have some kind of association with research institutions in Taiwan, it is very difficult for them to get that information themselves, and as each year passes, more of it will be lost forever. They depend on

people who can go into the aboriginal areas and communicate directly with the speakers” (p. 544). Until the late 1990s, the linguistic community still knew little about the morphosyntax of the Formosan languages¹ and even less about their dialectal variation.

Scholars and students alike responded to Starosta’s call, and the past 30 years have witnessed a number of drastic advances in the field of Formosan linguistics. In addition to a number of MA theses, dissertations, and conference presentations, a total of 952 journal papers, book chapters, and books were published between 1990 and 2022. As it would be impossible to review them all here, the focus instead is on the array of studies carried out in variegated theoretical frameworks (§ 4.3), the emergence of different working patterns and collaborations (§ 4.4), and the development of corpora and online resources (§ 4.5). The profusion of academic work in this rich and exciting period for Formosan linguistics did not appear out of nowhere: it builds on the pioneering work of the Japanese scholars Naoyoshi Ogawa and Erin Asai in the first half of the 20th century (Ogawa & Asai 1935; see Tsuchida 2000, 2009, P. Li 2009 for discussions of the importance of their work), the groundbreaking efforts carried out by Paul J. Li and Shigeru Tsuchida in the 1970s and the 1980s, and the many contributions of Western scholars and the underground work of foreign missionaries from the 1950s until the 1990s.

This chapter aims to supplement previous reports in Mandarin on the state of the art of Formosan linguistics by P. Li (1995, 2000), who summarizes the early stages of the development of Formosan linguistics, and Lillian M. Huang (2000), who focuses on MA theses and dissertations between 1936 and 1999, in order to highlight major research trends and call attention to new directions for research. Blust (2013, pp. 759–765) provides a broader overview by discussing aspects of the “world of Austronesian scholarship,” some pertaining to Formosan linguistics, offering details about the number of scholars actively engaged in the study of Austronesian languages, their affiliation, major research breakthroughs, regular conferences, and influential publications.

4.2 1990 as a Turning Point in the Field of Formosan Linguistics

At the outset, it is useful to explain why 1990 represents a turning point in the historiography of Formosan languages.

1 Major publications during that period include Tung (1964), P. Li (1973) and Tsuchida (1976) (see P. Li, this handbook, Chapter 3, and references herein).

The late 1980s correspond to the lifting of martial law and the gradual recognition of the diversity of languages and cultures of Taiwan, prompted by major social movements as well as the election of President Chen Shui-bian of the Democratic Progressive Party in 2000 (S. Hsieh 1994, Price 2019). It also corresponds to the time when linguistic institutes started to flourish throughout Taiwan, inevitably attracting linguists and students to the study of Formosan languages. Paul J. Li was the first to start teaching a field methods class at National Tsing Hua University in the spring of 1987 (P. Li, this handbook, Chapter 3). Lillian M. Huang offered regular field methods classes at National Taiwan Normal University from the early 1990s through 2006, and for a short period of time at National Taiwan University and in 1996, Shuanfan Huang offered courses on the study of Formosan languages at National Taiwan University.²

Courses offered in Taiwan by foreign visiting professors also helped create a favorable environment for the development of Formosan linguistics. Starosta, then a professor at the University of Hawai'i at Mānoa, taught at National Tsing Hua University during the spring semester of 1988, and some years later at National Taiwan University during the fall semester of 1996–1997. Robert Blust, also at the University of Hawai'i at Mānoa, was invited³ for a year (2001–2002) at National Chengchi University. In the autumn of 2008, Malcolm Ross, of the Australian National University, offered classes on historical linguistics for a semester conjointly at National Taiwan University and National Tsing Hua University (see also §4.4.2). In the meantime, the 1997 Linguistic Society of America Summer Institute, which was held at Cornell University, featured classes on the structure of Formosan languages by Paul J. Li and on historical issues in Austronesian linguistics by Malcolm Ross and John Wolff.

4.3 Research Areas and Topics

This incipient period created a first community of Austronesian linguists in Taiwan, who had both the training and the critical background to diversify and deepen their research field. Between the late 1980s and the late 2020s, the number of Formosan languages and dialects covered, and the research areas and theoretical frameworks through which they were investigated, grew substantially as a result. For instance, while in 1990 there were only a few studies on

2 Most linguists active at the time of writing graduated from one of these institutes before pursuing a PhD in Taiwan or abroad and in turn training new generations of Formosanists.

3 Robert Blust was also invited in 1994 to Academia Sinica under the auspices of Paul J. Li's project, and he was able to work on Pazeh (Blust 1999b), Kavalan and Thao (Blust 2003a).

Saisiyat, in 2020 over 60 studies were dedicated to this language, including two sketch grammars (Marie M. Yeh 2000, 2018) and a book-length study of Saisiyat morphology (Zeitoun et al. 2015).

In §4.3.1, modern advances in historical linguistics are discussed; §4.3.2 focuses on morphosyntactic comparisons among (or involving) Formosan languages; §4.3.3 looks at descriptive studies. New developments in linguistic theory and application, such as cognitive linguistics and formal linguistics, have been witnessed; these are discussed in §4.3.4. Finally, §4.3.5 points out the research that is yet to be done and the subfields of Formosan linguistics that have so far not received the attention that they deserve; the section finishes with a summary of major milestones reached within the past 30 years (§4.3.6).

4.3.1 *Historical Linguistics and Language Change*

The first truly modern linguistic studies of Formosan languages appeared in the 1970s and the 1980s. Many had a strong focus on the synchronic and diachronic phonologies of the Formosan languages and their consequences for the reconstruction of Proto-Austronesian (PAN) and of various competing subgrouping hypotheses. Studies on historical linguistics have never disappeared, but have diversified, as shown for instance, in Wolff's (2010) work on PAN phonology and the comparative work of Goderich (2020) on Atayal and of Shibata (2020) on Bunun, respectively. Over the past 30 years, diachronic studies have revolved around four major issues: (i) the phylogeny of Austronesian languages, (ii) reconstructions of morphemes and morphological paradigms at the PAN level, (iii) morphological reconstructions and history of specific languages, and (iv) language contact and language change.

An increased consideration of the position of Formosan languages in the last three decades led to significant advances in reconstructing the higher phylogeny of Austronesian languages, for instance by Starosta (1995), Blust (1999), Ho & Yang (2000), Sagart (2004), Ross (2009), and Aldridge (2021). As reported by Li & Zeitoun (this handbook, Chapter 30), many of these new hypotheses build on different types of evidence—lexical, phonological, morphological, and syntactic. The position of a number of Formosan languages has also been revised. Blust (1996) was the first to identify Thao as a Western Plains language and to demonstrate that many lexical similarities between Thao and Bunun were actually an outcome of extensive language contact rather than genetic affiliation. He was also instrumental in recognizing the previously unrecognized East Formosan subgroup, which includes Basay-Trobiawan, Kavalan, Amis, and Siraya (Blust 1999a). Ross (2009) reassessed the internal relationships of the so-called Tsouic subgroup (Tsuchida 1976) in light of comparative morphological data, by singling out Tsou as one of the four primary Aus-

tronesian offshoots and placing Kanakanavu and Saaroa under Nuclear Austronesian. Aldridge (2021) proposes a subgrouping quite similar to that of Ross (2009), with one major distinction that has to do with the accusative alignment of PAN. Her hypothesis is based on a minimalist analysis of the development of voice in PAN and does not rely on the comparative method.

Research on the reconstruction of PAN morphology goes back to the work of Wolff in the 1970s and more importantly Starosta in the 1980s. Starosta particularly focused on the development of two interrelated phenomena, voice (or focus) and nominalization (cf. Starosta et al. 1981, 1982). This research area was reinvigorated by Ross, who focuses on reconstruction of verbal (Ross 1995, 2009, 2015a) and nominal morphology (Ross 2006, 2015b). Other scholars have contributed to the reconstruction of a number of morphemes in PAN based on Formosan data, following a tradition established by Wolff (1973) and others in the 1970s, with the reconstruction of the stative prefix *ka- (Zeitoun & Huang 2000), the reciprocal prefixes *pa-Ca--*ma-Ca- 'reciprocal (of dynamic verbs)', and *paR~*maR- 'reciprocal (of stative verbs)' (Zeitoun 2002, L. Li, this handbook, Chapter 19); the causative prefixes *pa- 'general causative', *pi- 'causative of location', and *pu- 'causative of motion' (Blust 2003b); the genitive-case markers *na, *ni, and *nu (Blust 2015), the plural affixes *Na- and *a-/*-a- (Zeitoun 2009); and the bound-numeral form *puSa- (Zeitoun, Teng & Ferrell 2010). There has been discussion of the grammaticalization of the prefix *ki- 'get' in Paiwan, Rukai, and Puyuma (Zeitoun & Teng 2009); the development of *Si-/*si- 'to wear, to have' (Teng 2014); and a noteworthy master's thesis attempting to reconstruct PAN negators (S. Lin 2011).

Zeitoun (1995, 2003, 2015) has been working on the history of the Rukai dialects through a reconstruction of the grammatical features of this complex language. Stacy F. Teng (2018) is among the first to have focused on the internal comparison of the morphosyntax of the Puyuma dialects as the basis for the reconstruction of different aspects of Puyuma verbal morphology.

A final strand of historical research that has gained attention over the past 20 years concerns the effect of language contact and language change on the lexicon of Formosan languages. These studies focus on contact between indigenous groups (Adelaar 1994) or on influences of Chinese communities on Formosan languages (Blust 2003a, P. Li 2013, 2015, Kaybaybaw 2018, Sterk 2020). Another line of research has studied the mechanisms for introducing neologisms in Bunun (De Busser 2018).

4.3.2 *Morphosyntactic Comparisons*

Starosta was the first to systematically compare the Formosan languages on the synchronic level. Starosta (1988) provides, through an overview of the mor-

phosyntactic typology of the Formosan languages, “an appetizer for linguistics students in Taiwan” (p. 572). Starosta was also a vehement proponent of the ergative analysis in Formosan languages (see, for instance, Starosta 1997).⁴ Many studies have since been dedicated to this topic (Liao 2004, Aldridge 2004, Wang 2004, among others).

From the early 1990s onward, various major grammatical aspects of the Formosan languages have been tackled on a cross-linguistic basis, such as the use and functions of case markers and pronouns (P. Li 1997, Huang et al. 1998); verb classification (Ross 2015b); voice and transitivity (Shuanfan Huang 2002a, Huang & Sung 2008); reduplication (Zeitoun & Wu 2006, Lee 2007, H. Lin 2010, 2012, 2015a–b); nominalization (Jiang 2016); tense, aspect, mood, and modality (Zeitoun et al. 1996); negation (Yeh et al. 1998); reciprocals, existential, possessive, and locative constructions (Zeitoun et al. 1999, Zeitoun 2000), interrogatives (Huang et al. 1999); adverbial verbs (H. Chang 2010), serial verb constructions (Yeh & Huang 2009); and complementation (D. Liu 2011). Many of these topics have been revisited and reassessed in chapters enclosed in this handbook.

4.3.3 *Descriptive Studies*

Prior to the 1990s, almost no descriptive studies existed of the morphosyntax of Formosan languages. At the time of writing, the grammars of all the Formosan languages have been described, albeit to varying degrees. Lack of space prevents us from giving a complete overview of all language-specific studies of aspects of Formosan morphosyntax and of each descriptive sketch grammar in Chinese (see § 4.3 for a brief overview). However, it is possible to identify obvious lacunas in the state of the art: there is still a substantial dearth of detailed cross-dialectal descriptive studies, although some preliminary work has been done on Atayal by L. Huang (1995b) and P. Li (1998), on Rukai by Zeitoun (2015), and on Puyuma by Teng (2009, 2011, 2014, 2015, 2018).

An important shift took place in the early 2000s. The international linguistic community in the 1990s saw a surge of interest in endangered languages. The increased awareness prompted initiatives in the documentation and grammat-

4 Starosta (1988) defines ergativity as follows: (i) morphologically, intransitive verbs (including pseudotransitives) in Formosan and Philippine languages are marked by *m-*, while transitive verbs are commonly suffixed by *-(e)n*; (ii) syntactically, both nominative and genitive pronouns are used to refer to the actor, but nominative pronouns occur with intransitive verbs and genitive pronouns occur with transitive verbs; (iii) semantically, transitivity is associated with perfectivity (as defined in Hopper and Thompson 1980).

ical description⁵ of minority languages across the world. Formosanists started to realize that, with the Formosan languages facing extinction (some, such as Thao, Kanakanavu, and Pazeh-Kaxabu, are now moribund), revitalization was a necessary and urgent task that would have to be rooted in adequate and in-depth linguistic documentation (P. Li 2000, Zeitoun, Yu & Weng 2003). Documentary and descriptive linguistics bloomed, and various scholarly activities created a platform for dissemination and publication. Academic output took three main forms. Documentary work resulted in word lists and dictionaries (see Li, Joby & Zeitoun, this handbook, Chapter 5) and text collections, while descriptive research led to the publication of grammatical descriptions, either complete or partial.

Compilations of texts since 1990 can be roughly divided into three main categories: (i) narratives from Mantauran Rukai (Zeitoun & Lin 2003); (ii) rituals from Nanwang Puyuma (Cauquelin 2008); and (iii) folktales and myths from Central Amis (Fey 1993), Pazeh (Li & Tsuchida 2002), Paiwan (Early & Whitehorn 2003), Kanakanavu (Tsuchida 2003), Yami (Rau et al. 2006), and Thao (P. Li 2011).

In-depth grammars have recently been published for languages including Mantauran Rukai (Zeitoun 2007), Paiwan (Chang 2006), Nanwang Puyuma (Teng 2008), Truku Seediq (Tsukida 2009), Isbukun Bunun (L. Li 2018), and Kaxabu (Lim 2022). Extensive morphosyntactic studies have also been made available for Mayrinax Atayal (L. Huang 1995), Thao (Wang 2004), Central Amis (Wu 2006), Takivatan Bunun (De Busser 2009), Siraya (Adelaar 2011), Saarora (Pan 2012), and Saisiyat (Zeitoun et al. 2015).

Although the number of documentary linguists has increased exponentially since the 1990s, it should be noted that of the 952 publications on Formosan linguistics mentioned in the introduction, only 30 constitute comprehensive linguistic analyses, dictionaries, or grammars. This is largely due to practical constraints: producing a comprehensive grammar or a dictionary requires a lot of time; resources; adequate access to native language speakers; and years of dedication to recording, transcribing, and analyzing data in order to fulfill the demands of university employment, including the ways in which certain types of publications are evaluated for the purpose of tenure.⁶ However, longer works that are produced can constitute an important source for lan-

5 Himmelmann (1998) argues for a clear distinction between these two disciplines.

6 Noonan (2007, p. 125) notes that “[a]mong professional linguists, grammar writing is subtly discouraged by the way which grammars are evaluated for purposes of hiring, tenure, and promotion. At research universities in particular, published articles on theoretical matters are valued more highly than published grammars or grammar sketches.”

guage preservation and revitalization, as shown by the revival of Siraya, which has relied extensively on the work of Alexander Adelaar (2011). Sadly, with the disappearance of the last fluent first-language speakers of many Formosan languages, the window on the collection of the data needed to create these comprehensive text collections, dictionaries, and grammars will soon have closed forever.

4.3.4 *Theoretical Frameworks*

While a longstanding schism between functional and generative theories has divided the international linguistics community for over five decades (Harris 2022), Formosan languages have—rather unusually—been spared this controversy. From the beginning, studies having been carried out side by side using various functional and formal theoretical perspectives, generally in a spirit of cooperation. Functional studies have been approached from the perspective of Lexicase (Starosta 1988), the Basic Linguistic Theory (Zeitoun 2007, Pan 2012), Role and Reference Grammar (J. Wu 2006), cognitive linguistics (Shuanfan Huang 2002a, 2002b), and Systemic Functional Grammar (De Busser 2018), among others. Formalist analyses have likewise relied on various frameworks, for instance, the principles-and-parameters approach (Holmer 1996, H. Chang 1997), the minimalist framework (Aldridge 2004, 2015, Y. Chen 2008), various other incarnations of Chomsky's generative framework (Tsai 1997, Tang 1999, T. Chen 2018, among others), and Lexical Functional Grammar (K. Liu 2015, 2017).

One particular strand of research deserves special attention because of its innovative aspects and productivity. From the early 2000s onward, under the guidance of Shuanfan Huang at National Taiwan University, cognitive approaches to Formosan languages started to consider the role of pragmatics and discourse in the development of the grammars of Formosan languages (Shuanfan Huang 2002a, Shuping Huang 2008, Huang & Tanangkingsing 2011).

Shuanfan Huang (2002a–b, 2017) demonstrates the morphosyntactic variety of the Formosan languages by exploring the ways in which their voice systems behave differently from one another in discourse. This cognitive orientation also led to research on embodied cognition and metaphor. Maya Yeh (2002) and F. Hsieh (2007) published studies on strategies for encoding concepts of emotions in Atayal, Saisiyat, and Kavalan. These investigations paved the way for research on the metaphorical conceptualization of (i) happiness and anger in Truku Seediq (A. Tang 2015), (ii) euphemism (Lee 2011, this handbook, Chapter 39), and (iii) olfaction (Lee 2010, 2021) in several Formosan languages.

4.3.5 *Less Studied Research Topics*

Though the phonology of most Formosan languages has been described in grammars and stand-alone studies, few contrastive studies exist. In fact, H. Huang (this handbook, Chapter 8) appears to be, to our knowledge, the first of its kind. Detailed phonetic investigations of Formosan languages can almost be counted on the fingers of one hand. The first were probably Wright's (1996, 1999) studies, which are mainly concerned with the ways in which perceptual demands imposed by the listener contribute to production strategies on the part of the speaker, shaping Tsou consonant clusters. Chiang & Chiang (2005) is an acoustic analysis of Saisiyat as a pitch-accent language. Edmondson et al. (2005) is an articulatory study of continuants and the epiglottal stop in Amis. Finally, Macaulay (2021) is the first to examine Formosan intonation and prosody from a cross-linguistic perspective.

Other fields that are still underdeveloped and should be expanded in the near future include ethnolinguistics, computational linguistics, psycholinguistics, and neurolinguistics (Yano et al. 2019, Ono et al. 2020; see Collart, this handbook, Chapter 29). Two important areas in which linguistic research is urgently needed are language acquisition⁷ and language teaching. In a time when Formosan languages in many households are no longer being learned as a primary language, careful and scientific studies in these two fields will prove indispensable in counteracting language decline and meeting societal and linguistic demands for language education of native and non-native speakers.

4.3.6 *Summary: Milestones*

Over the last three decades, research on Formosan languages has made huge strides in every respect. Until the mid-1990s, there were no local PhD dissertations in Formosan linguistics.⁸ Henry Y. Chang was the first Formosanist to get a doctorate degree in Taiwan at National Tsing Hua University (H. Chang 1997), rather than at a foreign university. Since then, the training of Formosan linguists in Taiwan has progressed immensely. Since the early 2000s, the number of students who have graduated abroad and in Taiwan has remained stable over the years. One aspect in which improvement can be made is the education of indigenous scholars. Yan (1992) was the first Taiwanese indigenous student to write an MA thesis on his mother tongue, Amis. The first to write a PhD dis-

7 A subfield that could be viewed as an equivalent to TESOL (Teaching English to Speakers of Other Languages), named TFSOL (Teaching Formosan Languages to Speakers of Other Languages), should be developed in the years to come.

8 The first PhD program in linguistics was established in 1990 at National Tsing Hua University and in 2002 at National Taiwan University.

sertation was A. Tang (2011), who graduated from the University of Hawai'i at Mānoa, with a study of language planning in her native language, Truku Seediq.

From being an anaemic field producing the occasional study in the early 1990s, this section shows that Formosan linguistics has grown into a productive and comprehensive research field, and that we are now mastering a variety of topics on a number of languages, some of which have been briefly covered in the preceding sections. On the international stage, scholars such as Stanley Starosta, Robert Blust, and Malcolm Ross have played a large role in setting this change in motion through their teaching (see § 4.2) and through their publications. In Taiwan, continuous efforts made by Paul J. Li, Lillian M. Huang, Shuanfan Huang, Elizabeth Zeitoun, and younger generations of linguists have turned Formosan linguistics from a marginal academic discipline into a field with a broad appeal and exposure.

4.4 Emergence of Collaborative Work and Other Endeavors

The 1990s and 2000s witnessed the evolution of collaborative work, which can be characterized as peer collaboration at a national (§ 4.4.1) and international (§ 4.4.2) level as well as collaborative learning (§ 4.4.3). They also witnessed the emergence of linguistics journals (§ 4.4.4) and the bidding for major international conferences (§ 4.4.5).

4.4.1 *Peer Collaboration at a National Level*

One example of peer collaboration at the national level was led by Lillian M. Huang at National Taiwan Normal University from 1993 to 1999, and from 2011 to 2018, and another was supervised by Shuanfan Huang at National Taiwan University from 1997 to 2006. Collaborations involving Shuanfan Huang were covered in § 4.3.4 and § 4.5.1 and will not be repeated here.

Under the supervision of Lillian M. Huang, the main morphosyntactic features of the Formosan languages were investigated. Three major projects were carried out, the first on simple sentences, the second on complex sentences and the third on verb classification, which aimed to understand the variations among Formosan languages (and, to a lesser extent, dialects thereof) while acquiring a better grasp of specific languages. Two dozen manuscripts were written, with more than half presented at conferences and/or published. This collaboration culminated in the publication of a series of sketch grammars written in Chinese and published in 2000 covering all the extant Formosan languages. They were traditionally arranged and started with a short overview of phonology, followed by an investigation of morphology and syntax. The series

also included an introduction by Ho & Yang (2000) dealing with historical aspects as well as a few texts, a word list, a glossary containing the definitions of important terminology, and an index. This collaborative work was not without flaws; it had at least two main drawbacks: first, most of the authors had only a few years of research practice, and the writing of these grammars, though coordinated to a certain degree, proved difficult and yielded uneven results, revealing discrepancies in data and analysis. Second, while these grammatical sketches were intended for native speakers, they were not organized in a way that considered the progression of difficulties found in each language, and they did not include any exercises.

In 2011, Lillian M. Huang invited a large number of Formosanists to participate in a three-year project in order to work on the grammars of these languages again, by asking native speakers to join them in a collaborative effort, each author dedicating himself/herself to the writing of a single sketch grammar; while this new series did not include the introductory chapter that had been written by Ho & Yang (2000), it included many more topics (e.g., tips on orthography, dialectal variation, discussion of reflexives, reciprocals, and comparatives), with all data audio-recorded and available online. The grammars of 14 languages (officially recognized by the government at that time) were first published in 2016 and reedited in 2018, with the addition of two more sketch grammars, on Saaroa and Kanakanavu, officially recognized as the 15th and 16th aboriginal ethnic groups in June 2014.

From 2016 to 2018, another integrated project was carried out by a largely identical group of Formosanists and led to the publication in May 2022 of a series of books on parts of speech and their teaching for each of the 16 officially recognized languages. In the first part, each book proposes a series of morphosyntactic and semantic tests that determine the number of parts of speech in the language under investigation. In the second part, a series of teaching activities regarding these parts of speech is designed so that interested readers can use these books for self-study.

Another kind of collaboration is found across different research fields. An example is Paul J. Li's collaboration with the ethnomusicologist Rung-shun Wu on Kavalan folksongs (Li & Wu 2000) and nonritual songs of Thao (Li & Wu 2003) and the publication of two compact disks of the songs of Saaroa and Kanakanavu (2001) with Wind-records.

4.4.2 *Collaboration at the International Level*

Over the past 30 years, many scholars have been able to visit and work with local linguists in Taiwan. We have mentioned the classes taught by Stanley Starosta, Robert Blust, and Malcolm Ross in §4.2. A number of foreign schol-

ars were also invited for only two weeks (e.g., Peter Ladefoged in April–May 1993, Bernard Comrie in July 2007, and Isabelle Bril in June 2005 and November 2019) or longer periods of 2–18 months (among others, Søren Egerod in 1993; Robert Blust in 1994; Malcolm Ross in 2003 and 2009; Sander Adelaar in 2002 and 2003; Charles Randriamasimanana in 2001; Si-qi Zeng for two or three months nearly every year from 2005 to 2011; Josiane Cauquelin in 2005, 2006, and 2008; Véronique Arnaud in 2009 and 2010; Edith Aldridge in 2013 and 2014; and Christopher Joby from December 2020 to June 2022).

Many publications have resulted from these visits: Ladefoged & Zeitoun's (1996) short report on the nonexistence of pulmonic ingressive fricatives reported by Fuller (1990); the subsequent work by Peter Ladefoged's student, Richard Wright, on Tsou (Wright 1997, Wright & Ladefoged 1997); Egerod's (1999) revised Atayal dictionary; Blust's (2003a) dictionary of Thao and articles on Thao and Pazeh as well as his many discussions of other Formosan languages, including Rukai, Kavalan, and Paiwan (Blust 2013); Ross's (2015a) seminal paper on PAN verbal morphology; Adelaar's (2011) grammar of Siraya; Randriamasimanana's (2004) comparison of Atayal and Malagasy; Cauquelin's (2015) revised dictionary of Puyuma; and Aldridge's (2015, 2016, 2021) reassessment of Austronesian higher phylogeny.

Paul Jen-kuei Li collaborated for years with Shigeru Tsuchida. Together, they compiled dictionaries of Pazeh (Li & Tsuchida 2001) and Kavalan (Li & Tsuchida 2006), edited texts and songs from Pazeh (Li & Tsuchida 2002), and coauthored a research article on PAN infixes (Li & Tsuchida 2009) and another one on the subclassification of the Amis dialects (Li & Tsuchida 2022). Elizabeth Zeitoun worked with Josiane Cauquelin for three years, helping her to analyze the ritual texts that she had collected in the early 1980s (Cauquelin 2008). Together, they also published an article on the origin of the ethnonym "Puyuma" (Zeitoun & Cauquelin 2006). Elizabeth Zeitoun also collaborated for a short period of time with Véronique Arnaud on Yami and Si-qi Zeng on Bunun, and was instrumental in introducing Isabelle Bril to the Nataoran Amis community in 2009.

4.4.3 *Collaborative Learning*

Different collaborative projects have been undertaken by linguists, the first consisting of a close collaboration between a linguist and indigenous Formosans and the second of the teaching and supervision of aboriginal students at undergraduate and graduate levels.

Elizabeth Zeitoun of Academia Sinica began training aboriginal assistants and students in 1997. She worked in collaboration with H. Lin beginning in the late 1990s (see Zeitoun & Lin 2003) and since 2005 has been working with

Tai-hwa Chu and Lalo a Tahesh Kaybaybaw on Tungho Saisiyat. This long-term collaboration resulted in a number of papers and a monograph (Zeitoun et al. 2015). Victoria D. Rau of the National Chung Cheng University has also been collaborating with a Yami native speaker, Maa-neu Dong, for nearly 30 years, copublishing with her a fairly large number of works, among which Rau & Dong (2006).

A special mention should also be made of Adelaar's work on Siraya, which culminated with the publication of his grammar in 2011. For years, Adelaar has worked with the Siraya community, helping them to revive a language that was lost around the mid-1800s.

The training and supervision of aboriginal students engaged in linguistics have arisen since the 2000s, aided by dedicated universities in eastern (the National Dong Hwa University), northwestern (the National Hsinchu University of Education, which in 2017 merged with the National Tsing Hua University), and southern Taiwan (the National Kaohsiung Normal University). The College of Indigenous Studies at the National Dong Hwa University publishes a quarterly journal, the *Taiwan Journal of Indigenous Studies*, which aims to disseminate articles in Chinese and English on all fields of human and social sciences, including linguistics.

4.4.4 *Linguistics Journals*

Prior to the 2000s, publishing outlets were rather few in Taiwan. Linguistics papers used to be submitted and published in the *Bulletin of the Institute of History and Philology, Academia Sinica*, but there were few other options at the national level.

Four linguistics journals, *Language and Linguistics*, the *Taiwan Journal of Linguistics*, *Concentric: Studies in Linguistics*, and the *Journal of Taiwanese Languages and Literature*, came into existence or were revived in the 2000s and have contributed to the dissemination of research on Formosan languages. The Language and Linguistics monograph series (as an addition to the *Language and Linguistics*) features a number of books on the Formosan languages (including Pazeh, Thao, Mantauran Rukai, Yami, and Kavalan).

4.4.5 *Organization of Major International Conferences*

Institutions and universities around Taiwan have also organized major international conferences⁹ though such activities were interrupted starting in March of 2020 by the 2019 novel coronavirus (COVID-19) pandemic. Academia Sinica

9 Taiwanese universities and linguistic associations regularly organize conferences, workshops

has organized the 8th International Conference on Austronesian Linguistics (8-ICAL, December 28–30, 1997), the 13th International Conference on Austronesian Linguistics (13-ICAL, July 18–23, 2015), and the 19th Annual Meeting of the Austronesian Formal Linguistics Association (AFLA-19, June 26–30, 2012). The National Tsing Hua University held the 13th Annual Meeting of the Austronesian Formal Linguistics Association (AFLA-13, June 26–30, 2012). The National Chung Cheng University organized the 4th Conference of New Ways of Analyzing Variation-Asia Pacific (NWAVAP4, April 22–23, 2016). The Wenzao Ursuline University of Languages at Kaohsiung held the 18th International Conference of the Society of East Asian Linguistics (SEALS-18) (May 17–19, 2018). Two publications can be mentioned with respect to these gatherings, the proceedings of 8-ICAL (Zeitoun & Li 1999) and the festschrift offered to Lillian M. Huang at 13-ICAL (Zeitoun, Teng & Wu 2015).

4.5 Corpora and Online Resources

The period covered in this chapter coincides with the rise of the Internet age. This initiated another turning point in the study of Formosan languages: at the advent of the 21st century, primary language data started to be made available through online corpora. For the first time, it became possible to make a large amount of linguistic information on Formosan languages widely available to researchers and indigenous communities. This section gives an overview of corpora (§ 4.5.1) and other websites (§ 4.5.2) dedicated to the documentation of the Formosan languages in various formats, and reports on the immense progress that has been made over the past two decades.

4.5.1 *Online Corpora*

Three different corpora of Formosan languages, established by different institutions in Taiwan, are briefly introduced below: the Formosan Language Archive, the NTU (National Taiwan University) Corpus of Formosan Languages, and the Digital Archiving Yami Language Documentation.

Two notes are in order. First, these three archives are presented in both Chinese and English; and second, as members of the OLAC (Open Language Archives Community) network of archival repositories, these three corpora built their metadata sets according to the OLACMS principles and guidelines in order to conform to community-shared standards.

and summer seminars. In this section, we mention only those conferences that are not based in Taiwan and for which there was bidding.

The Formosan Language Archive at Academia Sinica was developed in 2001 by Elizabeth Zeitoun with the help of Taiwanese and foreign linguists, engineers, and native speakers, and existed until 2013. Its purpose was to collect, conserve, edit, and disseminate language and linguistic resources permitting access, among other things, to transcribed Formosan text collections on Rukai, Saisiyat, Tsou, Squliq Atayal, Isbukun Bunun, Southern Paiwan, Central Amis, Nanwang and Katripul Puyuma, Kanakanavu, Pazeh, and Siraya (see Zeitoun et al. 2003, 2005, 2007). The annotation tiers (including transcriptions, morphemic glosses, and translations) were devised during the pilot phase of this project between March and June 2001, at a time when few online corpora were available for comparison. Nonetheless, relational databases were constructed allowing the selection of texts in different formats (viz. “raw” data with partial linguistic annotations taken from published texts and more fully “linguistically annotated/reedited” data) transcribed in IPA and divided into paragraphs and sentences with translations with time-aligned audio files where available. The multilingual search system also allowed the user to exemplify the occurrence and distribution of all the affixes and lexical items recorded in the texts and to identify lexical categories.

The NTU Corpus of Formosan Languages was started in 2003 by a team at the National Taiwan University, headed by Shuanfan Huang, Lily I-wen Su, and Li-May Sung, with the help of engineers and graduate students (Su et al. 2008, Sung et al. 2008). The purpose of this corpora, which contained data on Saisiyat, Kavalan, Tsou, Amis, Seediq, and Bunun, was to provide spoken data (with, among others, a recording of “The Pear and the Frog” story), taking the intonation unit (IU) as the basic unit of transcription. A special feature of this corpora was that both audio and video recordings were available, along with linguistic and ethnological notes. A multilingual search system was available, allowing the user to retrieve the occurrence of a particular word in one language or across languages.

The Digital Archive Yami Language Documentation, headed by Victoria D. Rau and Meng-Chien Yang with the long-standing help of Maa-neu Dong and Hui-huan Chang, represents to date the most comprehensive and structured documentation project for any Austronesian language in Taiwan. This digital archive was set up in 2005 and includes a Yami–English/Chinese corpora, an e-learning website, and online dictionaries (see Li, Joby & Zeitoun, this handbook, Chapter 5). The Yami Digital Archive Corpus contains 58 thematically ordered texts, which were recorded in the field; the audio recordings are thus not always of the best quality and are not time aligned with the transcriptions. These texts were published, along with a sketch grammar and a glossary, as Rau & Dong (2006). The Yami Language Learning Center was designed as a

virtual classroom. It includes four textbooks, an online dictionary, and a grammar. The textbooks include 40 lessons designated as beginner, intermediate, and advanced, covering a wide range of genres and structures and organized for the most part as dialogues introducing Yami culture and folklore. The online grammar contains short descriptions of the phonology, morphology, and various aspects of Yami syntax (tense, aspect and mood, word order, clause types, structure of verb clauses and noun phrases, comparative constructions, numbers, and the prefix *ka-*), and there is no alignment between the audio files and the transcriptions on any of these pages.

It is important to understand the necessity for long-term public or private investment in these types of corpora in order to maintain and expand them and preserve their text collections for posterity. This is not presently the case in Taiwan; both the Formosan Language Archive and the NTU Corpus of Formosan languages had to be discontinued due to lack of funding, although it is hoped that this will only be temporary.

4.5.2 *Other Websites*

Other websites about Formosan languages are only available in Chinese, but they contain an enormous and unprecedented amount of data. Though many language specialists have been requested to help with the building of these digital resources, over the years it has necessitated the selfless, relentless, and assiduous work of hundreds of native compilers, working for different institutions at the same time. This section will only cover the three largest of these websites: the eLearning website on Formosan languages, the website of the Center for Aboriginal Studies, at the National Chengchi University, and the online database for language-proficiency tests. Many other websites are available by the Council of Indigenous Peoples, government institutions, nonprofit organizations, and just motivated private individuals, and all are evidence of an enormous leap in the dissemination of the Formosan languages.

The eLearning website of Formosan languages (also known as “E-Park” or “E-Garden”; see Lin et al. 2019) has been built by the mathematician and computer scientist Yu-yang Liu in the first decade of the 21st century and is hosted by the University of Taipei. To date, it represents the largest and the most impressive website of teaching materials on Formosan languages. It provides downloadable textbooks, teaching materials such as sentence-pattern drills, songs, online games, videos, and cartoons for all the extant Formosan (42 dialects representing 16 languages). Textbooks are available in different formats, i.e., as printable downloads, digital versions with embedded audio, and multimedia with video files.

The Center for Aboriginal Studies at the National Chengchi University (henceforth ALCD-NCCU) was established in 1999. In 2002, the Ministry of Education commissioned the ALCD to compile textbooks from 1st through 9th grades (shortened as 9-Level Textbooks below). In just a few years, books were written for 43 dialects—at a time when there were only 10 officially recognized languages—covering all the extant languages, including Pazeh/Kaxabu and Yilan Creole (then referred to as “Hanxi Atayal”), and 756 textbooks were compiled, as well as teachers’ manuals. They were completely revised in 2016–2017, with additional textbooks for the 10th through 12th grades. Other textbooks have been compiled under the supervision of the ALCD-NCCU introducing pronunciation, conversational exercises (as a supplementary edition to the earlier 9-Level Textbooks), readings, and cultural materials for the extant languages. All these language materials are available on the aforementioned eLearning website of Formosan languages.

The national language proficiency tests started in 2001 and were organized by the ALCD-NCCU in 2001 and 2003. Initially, these tests had only one level, and there were many problems, as outlined in Huang (2007). Since 2004, the tests are systematized by the School of Continuing Education at the National Taiwan Normal University, first under the supervision of Lillian M. Huang between 2004 and 2016, and since 2017 under that of Joy J. Wu. Proficiency tests, usually held in December of each year, have been reorganized so that there are now five test levels available for a total of 42 dialects representing the 16 officially recognized Formosan languages. Practice test banks have been available online for all 16 languages since 2008.

Two possible points of criticism could be raised for most of this online information. The first is that most of the data available actually represents translations from Chinese (the medium language), rather than spontaneous speech, and therefore contains a fair amount of inaccurate or unnatural information, something that is often pointed out by users. Secondly, orthographic systems for languages are not always correctly or consistently applied, and this leads to problems for language materials that are used in preparation of official tests. Despite this, these online sources are often invaluable to students of Formosan languages and contribute greatly to the body of information available on Formosan languages.

4.6 Conclusion

This chapter has attempted to survey the work that has been accomplished by Formosan linguists over the past 30 years, calling attention to both the work that has been achieved and the work that still needs to be done. It has also provided a brief introduction to the digital archives and online resources for Formosan languages that were created in order to open new horizons in the documentation, preservation, and revitalization of the Formosan languages and provide access to an enormous amount of data.

Ameka (2006, p. 100) states that “an important task of linguistics in the present millennium is the description and documentation of the languages that are still around. Such descriptions should be of very high quality—they should be faithful to the data, and they should be theoretically informed. Above all they should be presented both in terms of the metalanguage of description and in terms of the records in ways that are long lasting, replicable and verifiable.” Given the precarious state of many Formosan languages today, we can only hope that linguists in Taiwan and abroad, indigenous and non-indigenous, will continue to work hand in hand, overcoming theoretical and cultural differences and welcoming the contribution of new disciplines. This will be crucial for the future development of Formosan linguistics and for keeping this incredible Taiwanese cultural and linguistic heritage alive for generations to come.

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