Keyboard Layout Design for Minority Languages - (Socio)linguistic (app/im)plications

Keyboard Layout Design for Minority Languages - (Socio)linguistic (app/im)plications

Hugh J. Paterson III

SIL International

hugh@thejourneyler.org

04. April 2015

Version: Version: 0.7

CONTENTS

List of tables vi

List of figures vii

List of abbreviations viii

Acknowledgements ix

Abstract x

CHAPTER

1. Introduction 1

    1.1. Thesis layout 5

    1.2. Some core concepts and terms 8

        1.2.1. Model of character components and make up 9

2. Writing, text-input, and typing with keyboards 10

    2.1. Language Documentation versus Language Description 10

    2.2. The Digital Revolution 11

    2.3. The Endangered Language Movement 13

        2.3.1. Defining Language Development 15

    2.4. Writing in Society 15

    2.5. The Role and impact of design 15

    2.6. The Role and impact of technical social systems 15

    2.7. The objectification of languages 15

2.7.1. Objectification of the language 15
2.7.2. Object Culture 15
3. Methods 16
3.1. (Methodology) Methodological considerations 16
3.1.1. Keyboards 16
3.1.2. Orthographies 16
3.1.3. Typing behaviors 16
3.1.4. Current Design Processes 16
3.1.4.1. The design of orthographies and keyboards 16
3.1.4.2. Good Design 17
3.2. Orthography text samples and analyzed keyboard layouts 17
4. (Results)The data to be explored 18
4.1. impacts 18
4.1.1. objectification of the orthography 18
4.1.2. objectification of the keyboard, and the keyboard layout 18
4.2. What should a keyboard layout enable people to do? 18
4.2.1. write in their language, in their script 18
4.2.2. Control the computer 18
4.3. What components does the framework need to contain? 19
5. Methodology 20
5.1. UX Analysis 20
5.2. Methods in UX analysis 20

5.2.1. Specific methods related the acquisition of my data 20
5.2.1.1. Keystroke Counting 20
5.2.1.2. Survey Data 20
5.3. The Role of linguistic knowledge in UX 20
6. The results of several languages 21
6.1. Use Case #1 Me'phaa 21
6.1.1. Phonology 21
6.1.2. Orthography 21
6.1.3. Keyboard Layout 21
6.1.4. Social Use setting of typing in the language 21
6.1.5. Statistics from Text Analysis 21
6.1.6. Observations 21
6.2. Use Case #2 Chinantec 21
6.3. Use Case #3 Spanish 21
6.4. Use Case #4 English 21
6.5. Use Case #5 ??? - from Africa 22
7. What we can observe from these Use Cases and layouts 23
APPENDICES 24
Appendex I: Glossary of technical concepts and terms 47

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

1. Various issues affecting the development of social literacy in digital mediums for minority language speakers 7

2. Characters 9

LIST OF ABBREVIATIONS

ACKNOWLEDGEMENTS

I would like to thank Bob Hallissy of SIL International, NRSI for help understanding Unicode and converting non-Unicode texts to Unicode; Mark L. Weathers for his extensive knowledge of the use of technology in writing Me'phaa; Steve Marlett for inviting me to work with him on documenting the Me'phaa genus; Wilfrido Flores for giving me the opportunity to serve him in the creation of a Chinantec keyboard; John Brownie, the creator of Ukelele a program which makes the designing of keyboards layouts on OS X a really easy thing to do; Kevin Cline for explaining to me how MSKLC works and for creating the MSKLC keyboards for Me'phaa; Tim Sissel of SIL Mexico Branch for is assistance with the history of keyboard design in SIL's language program involvement in Mexico; John Gibbens for assistance in obtaining Mongolian texts and keyboard layouts for analysis; Coleen Starwalt and Heidi Rosendall for assistance in obtaining Mongolian texts and keyboard layouts for analysis; Kirby O'Brien for his involvement in refining some of the graphics used to demonstrate some of the ideas of this thesis; Becky Paterson for proof reading and helping a visual processor like me reduce my thoughts to keystrokes. SIL International Americas Area for sponsoring my involvement in the Me'phaa genus Language Documentation project. I take full responsibility for all errors.

This thesis was proudly typeset with XLingPaper.

ABSTRACT

CHAPTER 1

Introduction

Keyboard layout design affects language vitality. Socio-technical systems are increasingly important in today's communication ecology (Whitworth & Ahmad 2013). Language development projects and language planing programs need a way to integrate linguistic knowledge, information, and transmission practices into socio-technical systems if the languages used in these systems are going to be the mother tongue languages of minority language speakers. With the current rate of technological adaption it is more than feasible that technical systems (such as social media and the mobile devices used to access these systems) will become more relevant than the traditional, printed, literacy reading primer (Blench 2012: 15). This requires addressing the design tension between requirements for minority language users and the Human Computer Interaction (HCI) requirements of computing devices. The academic linguistic community often attempts to address these tensions at the orthography "design" level (Cooper 2005: 160, Jany 2010b: 235-6). However these "solutions" often revolve around removing diacritic marks from Roman script orthographies (Boerger 2007: 134) and do not address the marking of tone in languages, such as Chinantec (Foris 2000) and some African languages (Roberts 2011), where there is a significant need to mark tone. Such solutions also do not affect key frequency issues, or diacritic marks in Ajami and Indic scripts. This project focuses on the arrangement of keys on the keyboard, or keyboard layout (KL); proposing that KL's are the cornerstone to truly adapting the digital content creation process to the needs of minority language users. In the context of minority language text input design specifications and considerations, there has been relatively little published, either for the publishing industry, linguists, or for technologists

(designers and programmers). The one exception is an unfinished book released in draft form by SIL's foundry NRSI (Lyons 2001). In contrast to the relatively sparse literature specifically supporting and covering minority language text input, QWERTY keyboard interactions, primarily dealing with English, are well studied (MacKenzie 2002, 2007, 2013, MacKenzie & Tanaka-Ishii 2007). This current study takes current practice in the HCI literature and applies it to several minority language use cases, focusing on languages which use diacritics, often as a device used to explicitly mark tone in their orthographies.

In communicative environments where there is the option to use more than one language, choice of language is based in both social and physical environments. Orthography design decisions are often perceived to have an effect on the mechanics of language expression in digital mediums. However, strictly speaking it is only the text input method not the orthography which plays a role in the mechanics of creating new entextualized content in digital mediums. Emotional responses to physical elements of a language such as the design of orthography, the computer operating system, and of the text input method bear upon the language user. In the disciplines of language documentation and language description, text input methods may initially be developed with the needs of the researcher in mind rather than the needs of a native speaker who uses the language in everyday interactions. These existing keyboard layouts that support specific languages,which are created by researchers, are rarely used by the broader minority language community, and the efficacy of these keyboard layouts is limited to linguistic analysis or researcher convenience. Linguists often bring linguistic knowledge and some of their own expectations as 'experienced' computer users to the keyboard design process. They may not realize that requiring a typist to negotiate a keyboard layout to access a given character (often a non-ASCII character) can have an impact on language-use choice, the development path of an orthography, or adherence to an approved orthography. User-centric keyboard layout design for minority language community writers/typists should be an integral part of a language development project in the twenty-first century. These considerations bring us to the following question: At what point

in the design process should linguistic information be considered and applied, as opposed to other design criteria, so that maximal language usage is encouraged and made possible? This study offers a framework for the linguist or language development worker to address crucial issues of keyboard layout design.

There are four reasons that the mechanical process of writing and the process of typing in digital contexts (text input) is of interest to those who study languages: they are an expression of thought, a means of communication, and a reflection of brain processes. First, keyboarding is an expression of language and reveals some very unique ways that the human body expresses communicative thought. For instance, consider the ability to type 'LOL' without actually laughing or thinking "laugh out loud". These typing gestures can connect with our thoughts without activating the vocal or aural mechanisms which are often employed in the encoding and decoding of communicative thought. The study of the mechanics of writing is not new. European Renaissance writers were discussing hand writing in relationship to personality, as early as the sixteenth century (Baldi 1622). More recent works focus on: the relationship between handwriting and brain processing (Askov, Otto & Askov 1970, Peck, Askov & Fairchild 1980), motor control (van Galen 1991), and the developmental and pedagogical change insinuated by moving from handwriting to typing as the mechanical bases of the expression of textual compositions (Christensen 2004, Stevenson & Just 2012). Second, the language teacher (including second language instructor) is interested in language use in all mediums; computer-mediated communication, and oral communication. Chapelle (2003) and Jones & Plass (2002) differ in how they conceptualize the integration of technology use in the language learning process. However, regardless of the theoretical approach, typing and keyboard input is an acknowledged component of the Computer Assisted Language Learning (CALL) environment (Strik 2012: 9) if nothing else but to facilitate other more salient aspects of learning theory activities. More specifically though Lally (2000) and Sturm (2006) argue that keyboarding and typing does effect the way that language learners recall the use of diacritics on words. The

third reason that typing (text input) is of interest to those who study language is that the psychologist and linguist are interested in how the brain processes language through the process of writing, which includes typing (text input). This thesis will touch on various aspects of these three points as it proposes a framework for keyboard layout design. The fourth reason that is text input is important to those who study language is that text input is important in the language development movement. That is, as more and more minority language using communities approach the task of language development they often reach out to those who study languages (linguists) for help. As Lally (2000) and Sturm (2006) argue that keyboarding affect the way that language learners remember characters, it seems logical then that for learners of languages, even if they are native speakers, or heritage learners would be subject to the same impacts of typing on the way they learn the written form of the language they are using. This is an important point which needs to be worked into language development practices by those involved in language development activities like orthography development which in some sense can be a sub-component of text input development or writing development. In particular, diacritics and their use in orthographies become important since it is estimated that between 60-70 percent of languages are tonal (Yip 2002: 1) and diacritics are the primary way orthographies indicate tone.

Keyboard layout design is intrinsically interdisciplinary. To create a tool for language use which not only works but is embraced by a group of users requires an understanding of linguistic knowledge, script knowledge, and digital technology knowledge germane to the language entextulization challenge. For a new keyboard layout (analyzed as an object) to be embraced by a user group requires a successful application of principles from economics, anthropology, and design, especially user experience design. That is, people must be able to access the object, want to use the object, and finally choose to use the object.

1.1 Thesis layout

Chapter one of the thesis provides a brief introduction to the topic of keyboard layouts. It presents the relevance of the study of text input to linguistics. It also provides an overview of the various chapters in the thesis and a discussion of key concepts and terms used throughout the thesis.

Chapter two of this thesis takes the reader through the relevance of writing to the disciplines of linguistics and language development. It is often within this context that new keyboard layouts are created for monitory languages. The first section discusses entextulization and the process often followed in developing writing for the purposes of linguistic research, language documentation and language development. These settings are not without conflicting views surrounding writing as a part of language development. Just as writing is affected by various social practices and communal attitudes towards writing, so also the process of typing (text input) is affected by similar social constraints. That is, the need for writing, and therefore also the need for text input, is not felt ubiquitously.

Included in chapter two is an introduction to writing and discussion of the current literature relevant to human computer interaction (HCI) and keyboard interaction analysis. Academically, user experience design falls under the broader discipline of computer science, therefore much of the literature discussing text input (even in minority languages) does not occur in the linguistics or language documentation literature. Current literature concerning keyboard layout design, while not solely based on English language text input, is predominantly based on English language research. Furthermore, this research is rarely cited and apparently un-accessed by language development staff in the production of keyboard layouts (p.c. with various keyboard layout designers). For these language development staff a far more pressing goal is the correct typesetting of professional documents, therefore the keyboard layout becomes a way to limit (or quality control) data input options for text processing systems[1]. It is the goal of this thesis to integrate HCI and language development

[1] The creation of keyboard layouts and text input systems is sometimes delegated to publishers (and typesetters and their foundries). These stakeholders in the publishing process are very interested in consistent

literatures so that the language development professional has a resource which references both literatures and provides that person with a framework upon which to design future keyboard layouts. Figure 1 is a visualization of the various topics discussed in this thesis and their inter-relatedness. It attempts to layout the topical landscape on two clines: the community internal - external cline (right and left sides), and the issues affecting the desire and capability of a community to engage in the act of writing (top and bottom). Connecting the various topics are several classes of lines which generally show some sort of association, though the association is not always the same in every language's situation. Heavier lines generally show more relatedness, while dotted lines show an amorphous relationship. Arrows generally show direction of impact when a directionality is determinable.

Chapters three and four of this thesis present a comparative study of the alleged typing experience in fifteen languages. Thirteen of these languages use the Latin script (also know as the Roman script), and two of these languages use the cyrillic script. The Latin script based languages contain a variety of diacritics, and diacritic use frequencies. The Book of James is used as a corpus to derive keystrokes. These keystrokes and their frequencies are then compared and used to make suggestions for keyboard layout designs.

Chapter five highlights some outstanding issues in keyboard layout design in terms of theory, technology, and practical application of language related knowledge to the keyboard layout design process.

Back matter: It is hoped that the reader finds the interdisciplinary bibliography useful. It covers the topics user experience design, orthography design, keyboard layouts, and the sociolinguistics and sociology of writing. Following the bibliography is an appendix with a short glossary of technical terms. A second appendix with a list of the technical standards referenced in this thesis. In a third appendix, for the sake of completeness and for the benefit future researchers the analyzed texts are included in their entirety.

---

encoding of texts. As an example some packages of LaTeX require the special declaration of combining glyphs to form characters and can not accept strait Unicode characters (Goossens, Rahtz & Mittelbach 1997: 264-5). This more restricted approach to text input can be seen as a challenge for self publishers, who prefer a more straightforward approach to entextualization.

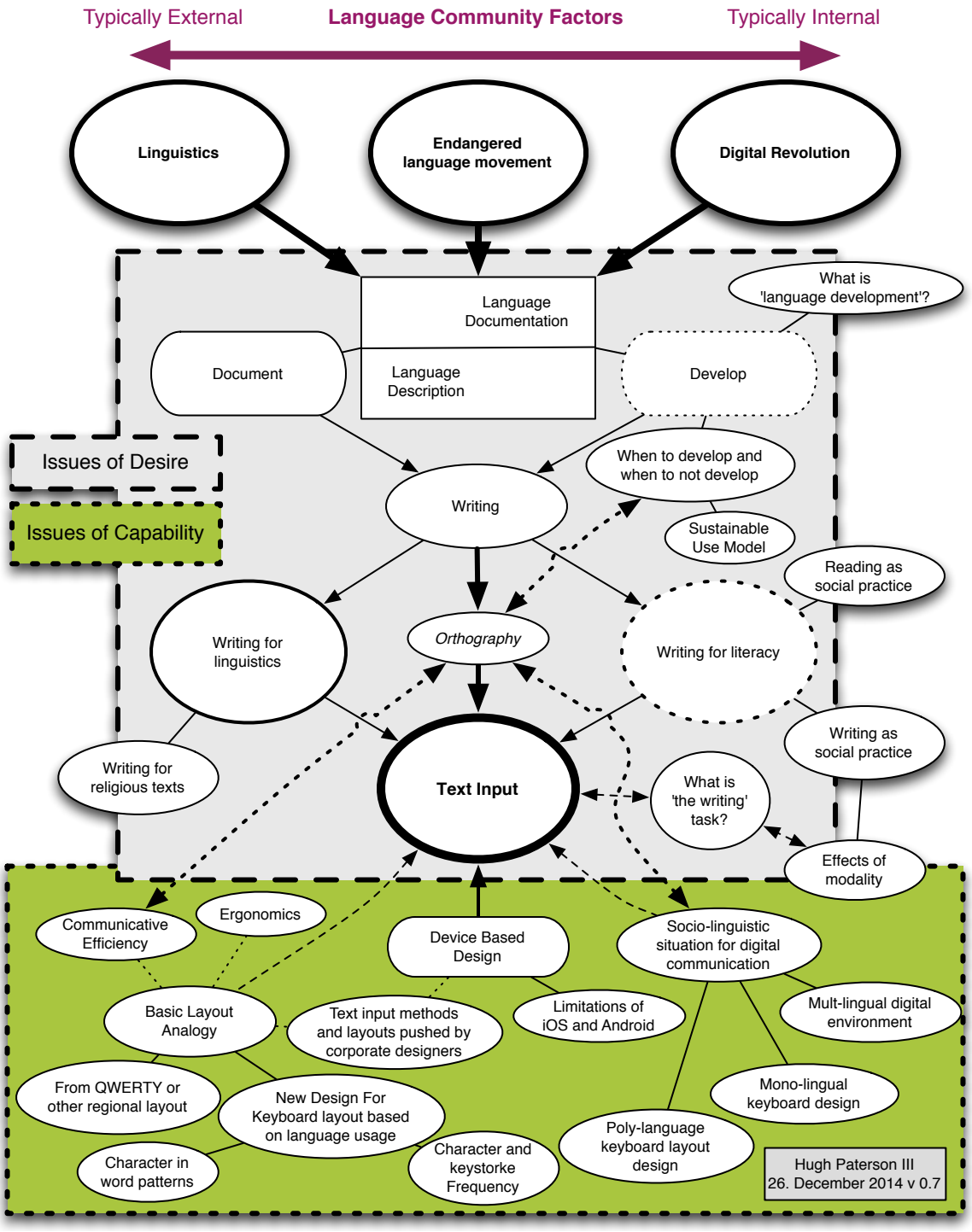

Figure 1. Various issues affecting the development of social literacy in digital mediums for minority language speakers

1.2 Some core concepts and terms

This section provides a cursory discussion of key concepts and terms used throughout this thesis. Some of these terms are also available in the glossary contained in the back matter. It is acknowledged that in each of the respective fields, various authors use the same term with various connotations of scope. Therefore for clarity it is necessary to address what is meant in this thesis by these terms, and it is hoped that addressing these key terms earlier rather than later in the thesis will provide additional clarity to the reader. Many of these terms are not new and exist in other, non-linguistics literatures. The goal in presenting these 'models' is not to articulate or present a comprehensive taxonomy of knowledge in the fields represented. Rather the purpose is to give the reader a brief overview on the issue as this thesis will reference concepts and terms from various academic disciplines and areas of practice. However, some topics in this section will be discussed in more detail than others.

1.2.1 Model of character components and make up

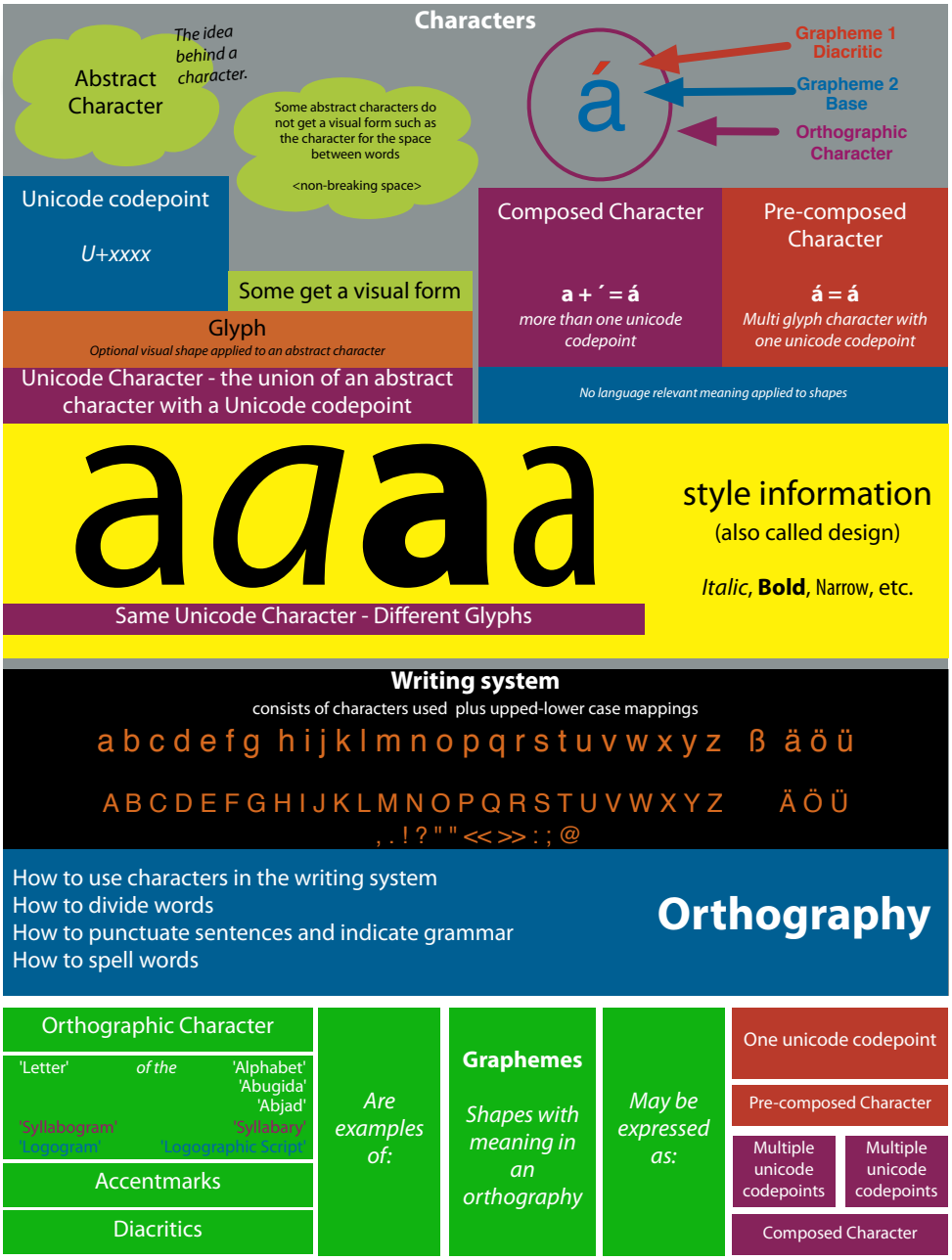

Figure 2. Characters

CHAPTER 2

Writing, text-input, and typing with keyboards

Desire, ability and opportunity function together to allow minority language writers to produce written materials in their languages. Keyboards and text input are the gateway to creating these text in digital mediums. Where any one of these three factors fail to exist regardless of the digital/non-digital context text output will be affected. That said, each of these factors can be affected by the technology, through the user's interaction with the technology. Technology (either digital devices or an orthography) in and of itself is not the saviour of an endangered or minority language, though it can be the platform on which many new conversations are conducted. The reason for this is that the problems of text production are fundamentally sociological, not technical. The technical aspect surfaces as a challenge when certain sociological impacts are not achieved. The sociological task (tasks when completed result in impacts) most relevant to this thesis is the speed of communication. However, in the mind of the user it is likely the ease of communication in a written form. For the typing experience to be successful by any calculation, language users must be trying to communicate via keyboards and text input. Inherently this infers a social attitude about writing. It is this attitude which is the ultimate medium of keyboard layout designer's craft.

2.1 Language Documentation versus Language Description

Since the early 1990's language documentation has emerged as its own discipline (Furbee 2010, Himmelmann 1998, Woodbury 2003) growing out of the field of linguistics. One of language documentation's distinctives is the collection of original language

use performances (Nathan 2010) in digitally archivable formats (Bird & Simons 2003). Within linguistics the focus on primary data is a shift in paradigm (Thieberger & Musgrave 2007: 27-9) as much as it is in methods (Bergqvist 2012: 24). Language Documentation has focused on creating lasting and multi-purpose language artifacts, where as linguistics, focusing on description, has traditionally sought to identify the patterns occurring within and around language use. Along the way, and facilitating the split between language documentation and linguistics, the field of linguistics has encountered two other notable movements: the digital revolution, and the endangered language movement. These movements have changed the the focal evidence of linguistic argumentation from being an evidence based science argued from antidotal observations by linguists worried about the observers paradox (Labov 1966, 1972, 2006), and descriptions of languages based on written forms of observed linguistic performance (for example hand transcribed Swadesh lists (Swadesh 1971: 283), to a science driven by data, rich with reviewable examples of performance (Coleman 2011, Schroeter & Thieberger 2011, Thieberger 2009) gathered collaboratively by speakers and researchers (Dwyer 2006: 54-6, 2010, Kuhlmann 1992: esp. 277-278, Leonard & Haynes 2010, Penfield, et al. 2008).

2.2 The Digital Revolution

The first of these two movements is the Digital Revolution. The advent of socially embraced digital communication has affected the behavior of both the observed (Kiesler, Siegel & McGuire 1984) and the observer (Crasborn 2010); the speaker and the listener (Seltzer, Prososki, Ziegler & Pollak 2012); the writer (Porter 2003) and the reader (Fortunati & Vincent 2014, Liu 2005, Mangen, Walgermo & Brønnick 2013). Digital devices are reshaping the communicative context in which 'language' exists. Handheld radios are replacing surrogate speech forms in Chinantec [cso] society (Wilfredo Flores, pc.; Mark Sicoli in segment 23:00-23:17 in D. Duncan 2013). Research in L1/L2 and L2/L1 transference, and the role of orthographies in the production of sounds suggests that devices

with text based dependencies for operation stand to have the potential to expedite the re-shaping of sounds in a minority language via the graphical similarity between a minority language orthography and the orthography of a language of wider communication (Detey & Nespoulous 2008, Major 2008: 69, Perre, Pattamadilok, Montant & Ziegler 2009, Simon, Chambless & Kickhöfel Alves 2010, Vendelin & Peperkamp 2006)[1]. The change of language use (including loss of historically spoken minority languages) is not the only impact digital devices are having on minority languages. In some contexts minority language speakers are either adapting language use habits to incorporate the use of digital devices (Lexander 2011) or adapting their language related products (orthographies) so that it can more readily be used on existing devices (Jany 2010b: 235). Digital tools not only allow for new methods of language analysis using large multimedia corpora (Crasborn, Hulsbosch, Lampen & Sloetjes 2014), but also enable people to communicate across time and space in new ways (Brinckwirth 2012, Elia 2006, Maslamani 2013). Computer and electronic device meditated communication is a reality in current language use - both oral and written. To the 21st Century linguist this means not just studying language in its non-digital contexts, but also in its digital contexts. With the introduction of the mobile digital context, language users no-longer have a choice between the two modalities of oral v.s written, rather there is a complex array of options available to most people which cover a plethora of communicative devices and multi-modal/multi-medium scenarios. For example, interlocutor 'A' may get a short email message on his computer from interlocutor 'B' and reply via the 'Facebook Chat' app via his mobile device and carry on several exchanges with interlocutor 'B' before walking into interlocutor 'B's' office and continuing the conversation orally. All the while each segment of the conversation is constrained by the medium it occurs within. Computers have larger screens and keyboards, smart phones have smaller screens and smaller

[1] These claims are not universally accepted. Inconclusive results are presented by Pytlyk (2007, 2011); and Pattamadilok et al. (2011: 121) while arguing for the orthographic influence on phonology point out: "… that whether orthographic knowledge affects the core mechanisms of speech processing (e.g., lexical access) or some more peripheral processes (e.g., explicit segmentation or decision/comparison) seems to depend strongly on the choice of the tasks that researchers use to probe speech processing." For the purpose of this paper, I take this to mean that there are likely a variety of factors affecting the orthography-pronunciation relationship; of which orthography in the digital device is one.

keyboards but also have oral to text features packaged with their Operating Systems, while oral face-to-face communication usually carries with it a host of visual cues and 'reduced' speech forms.

2.3 The Endangered Language Movement

The second of these two movements is the endangered language movement. The endangered language movement can be broken down into two main tenants: document and develop. Krauss is credited with sounding the cry which started this movement (Hale, et al. 1992:9). Sounding a cry that linguists have not only a responsibility to study and document these disappearing languages but also to assist their speakers in the task of developing their languages. He says:

> We should not only be documenting these languages, but also working educationally, culturally, and politically to increase their chances of survival. This means working with members of the relevant communities to help produce pedagogical materials and literature and to promote language development in the necessary domains, including television.

In the context of the endangered language movement, it is important to distinguish language development from language documentation. Unlike language documentation, language development is not a new concept; being defined as early as 1968 by Ferguson (1968). The distinction between language documentation and language development is pressed by Simons (2011), nineteen years after Krauss[2]. Simons defines language development as:

> … activities undertaken for the purpose of developing new functions for its language or for restoring lost functions.

There are two pertinent remarks when considering Simons' definition. The first relates to the first movement mentioned previously - The Digital Revolution. That is, for many

[2] Although Ferguson (1968) also does layout much of the same definition for language development.

languages ‘new domains’ would include making the language viable in digital contexts, be it written, or oral, or oral with visual support (like YouTube and more generally all kinds of video). The second remark is that the long time delay in formally defining ‘language development’ does not mean that development and development-like activities were not undertaken prior to Krauss’ call to action or in the interim between Krauss and Simons’ formalized definition. Blench (2012: 13) generalizes the language development pattern in a Nigerian context for the past century saying:

> A language was first analysed linguistically, a draft orthography was developed, primers to teach the language were printed, and as literacy initiatives were undertaken, Bible translations were very often begun. Wherever literacy took off, in major languages such as Hausa and Yoruba, this would ‘leak’ into the secular sphere. Books, newspapers and advertising would pick up on the possibility of targeting specific ethnic audiences.

Krauss’ call has not gone un-heeded, and in contrast to the characterization of events over the last century provided by Blench, the journal Language Documentation & Conservation is rife with more recent examples, perspectives, and use cases where linguists have engaged with communities to help “develop” their languages (Amery 2009, Otsuka & Wong 2007, Yamada 2007). Often these use-cases use the term ‘language revitalization’ to describe their language development type activities. Many ethnolinguistic communities have undertaken language ‘revitalization projects’ to fortify the social and pragmatic positions of heritage languages (for examples see: Reyhner & Lockard 2009). However, the lack of a clear distinction between ‘language documentation’8 and ‘language development’ for so long a period of time by many practitioners leads to three observations: (1) that in general there has not been a clear distinction in the literature between language development activities and language documentation activities, by those engaged in either or both activities; (2) that in general these activities do not usually occur individually; and (3) perhaps for many language communities what is desired is not a language documentation endeavor, but rather

a language development endeavor. That is, generally the activities of language development are encountered in documentation projects as persons affiliated with the academy pursue and engage minority language users. As pointed out by Mosel (2006: 68), the common case is that those activities which make it to the literature, do so because it is persons affiliated with the academy, looking to fulfill the requirements of the academy. Requirements of the academy often include publishing (Nature 2013, Priem, Taraborelli, Groth & Neylon 2010) and a demonstrable impact (Taylor 2011) which itself is part of a larger departmental research profile (for an example see materials by: Provost of the University of Wisconsin 2014).

2.3.1 Defining Language Development

2.4 Writing in Society

2.5 The Role and impact of design

2.6 The Role and impact of technical social systems

2.7 The objectification of languages

2.7.1 Objectification of the language

2.7.2 Object Culture

CHAPTER 3

Methods

This reviews the literature.

3.1 (Methodology) Methodological considerations

3.1.1 Keyboards

Physical v.s virtual

mobile v.s stationary

3.1.2 Orthographies

Do they get designed around computer technology or are they

3.1.3 Typing behaviors

What do I mean by this? Is it typing behaviors as in use of the keyboard layout? Or what the behaviors should be like Dvorak v.s. Qwerty.

3.1.4 Current Design Processes

Something about different views on these relationships.

What is the current processes?

3.1.4.1 The design of orthographies and keyboards

3.1.4.2 Good Design

3.2 Orthography text samples and analyzed keyboard layouts

CHAPTER 4

(Results)The data to be explored

What is a design framework and why is it needed?

How does design relate to keyboards?

What are we teaching about language by showing complex ways to type a language?

The User group and the community are to separate but related concepts.

4.1 impacts

4.1.1 objectification of the orthography

The mixing of the orthography and I density as a brand

4.1.2 objectification of the keyboard, and the keyboard layout

4.2 What should a keyboard layout enable people to do?

4.2.1 write in their language, in their script

What is the difference between writing and typing?

Why is this significance relevant?

4.2.2 Control the computer

4.3 What components does the framework need to contain?

Language Family

Language overlap settings

Language use in diaspora

Unicode and non-encode text

CHAPTER 5

Methodology

5.1 UX Analysis

Provide a definition of UX

Provide relevance to of UX decisions to Linguistics and language choice

5.2 Methods in UX analysis

Some general methods in UX analysis

Do linguistics do UX analysis?

5.2.1 Specific methods related the acquisition of my data

5.2.1.1 Keystroke Counting

Character counting v.s keystroke counting

5.2.1.2 Survey Data

The questions asked in the survey

The reason why the questions are asked

5.3 The Role of linguistic knowledge in UX

ux

adsfuxa

CHAPTER 6

The results of several languages

6.1 Use Case #1 Me'phaa

6.1.1 Phonology

6.1.2 Orthography

6.1.3 Keyboard Layout

6.1.4 Social Use setting of typing in the language

6.1.5 Statistics from Text Analysis

6.1.6 Observations

6.2 Use Case #2 Chinantec

6.3 Use Case #3 Spanish

6.4 Use Case #4 English

6.5 Use Case #5 ??? - from Africa

CHAPTER 7

What we can observe from these Use Cases and layouts

APPENDICES

APPENDIX A

Appendix I: Glossary of technical concepts and terms

APPENDIX B

Appendix II: List and purpose of referenced standards

APPENDIX C

Appendix III: Full text of analyzed text

C.1 Me'phaa Full Text

ISO 639-3 code of language: [tcf]

Title of the text: Santiago (Mẹ'phạạ Mañúwịín)

Cited as: Carrasco Zúñiga, Estanislao & Mark L. Weathers. 2008-2010. Santiago (James). Ms., Pre-Publication Draft of Bible Portion.

Text provenance: The text was received from the Mẹ'phạa language development and Bible translation team via Mark L. Weathers on 31 May 2011.

What I did to the text before using it in comparisons: this text was likely the most complex to process. It required conversion from a custom encoding to Unicode. __(tool used; mapping uses; method obtained)__*since the team has left the moved their project to unicode* after conversion, SFM markers were removed. Section headers were removed. Carriage returns were also removed.

Copyright holder as indicated: SIL International and local language speakers. Used by written permission.

The Text: Ikhúún ñajun' Santiágọ, mbọ na'ne ñajuun Anạ'ló' jamí Tátạ Jesukrístọ. Naxụ'má ịyịi' rígẹ' inala' ikháan' tsáan' mbọ gụwạ' ạjmạ múú kuthiin ịjịin Israél ñajwanla', tsí nịdrú'úún mbá xúgíí inuu numbaa. Narạxạán'la'. Ạnguịn', tsáan' ninimbạ'la' jụyạá Jesús, gạjụmạ'la' rí phú gagi juwala' ídọ rí nanújngala' awúun mba'a inii gajmá. Numuu ndụyạá mála' rí ídọ rí nạ'ngạ'la' inuu gajmá, nasngájma nẹ rí gakon rí jañii ạkiạn'la' jụyạá Anạ'ló', jamí na'ne nẹ rí mạwajún gúkuála'. Ịndọó má' gí'maa rí mạwajún

gúkuála' xúgíí mbi'i, kajngó mąjráan'la' jamí mą'ne rí jañii ąkiąn'la', asndo rí náxá'yóo nitháan rí ja'yoo mąnindxą'la'. Xí mbáa tsí ikháan'la' tsí'yoǫ dí gá'niį, ga'thán jáñuų Aną'ló', jamí Aną'ló' gá'ne rí mbą'yoǫ rí mą'niį. Numuu rí ikhaą tsígéweęn rí naxnúų mbá xúgíin tsí nųndą'áą jamí tsí'théęn numuu nę. Indǫó má' numuu rí tsí nąndą'ą, gąndą'ęę gąjmąá mbá jañii ąkuiįn, mąxá'ne rí ąjmą ąkuiįn nitháan. Numuu rí tsí ąjmą ąkuįin asndo xó rí nambúxųų' inuu iya ąphą ja'niį, rí gęę ñú'ú ixpátra'a e'ne gíñá. Xąbǫ tsí xkua'nii ja'nii, xájųmųų rí mąjanáą tháan rí nąndą'ęę gá'ne Aną'ló', numuu rí tsí ąjmą ąkuįin, nari'khuų má' xú'khuęn mbá xúgíí rí na'niį. Dxájwaló' tsí ngínáa, xátįyųų', numuu rí phú gí'doo numuų ná inuu Aną'ló', xómá' tsí phú gí'doo rá, xátįyųų' ídǫ rí Aną'ló' maxríguíį, numuu rí tsí phú gí'doo nąnguá mbąyǫ' xtáą xómá rę'ę rí rígą ná xanáá. Ídǫ rí ną'khą ąkhą', nagigoo numbaa, jamí nojndoo iná. Ą'khuęn rí nafrigu rę'ę jamí nánguá mitsaan giaxųų nę. Xkua'nii má' mąmbáa tsí phú gí'doo jamí mąmbá rigąa mbá xúgíí rí gí'doǫ mangaa. Phú gagi xtáa xąbǫ tsí tsí'ne rí xkawę́ ídǫ rí nąguma rájáa, numuu ídǫ rí nį'ngǫǫ inuu gajmá, ą'khuęn mbayáą numuų rí mąxtáą jámuu, rí nixuda minąʼ Aną'ló' rí maxnúų tsí nandúún juyáą. Ídǫ rí mbáa tsí ikháan'la' nąguma rájáa rí mą'ne rí xkawę́', mąxá'théęn rí Aną'ló' ne'ne rájáą. Numuu rí tsí Aną'ló' tsíyoo rí mąguma rájáą rí mą'niį rí xkawę́', ni má' ikhaą tsí'ne rájáą nimbáa. Ą'khuęn gakon, mbámbáa nąguma rájáa ídǫ rí nixmánguą'ąąn e'ne rí xkawę́' nandxa'wá minęę' jamí rí nąnigųų'. Ídǫ rí nitǫ'ǫǫ má' jųmą rí xkawę́' ná idxųų xąbǫ rá, mągąnú mbi'i rí mą'niį a'khán gá'ne nę. Jamí ídǫ rí wámbą má' nigająą a'khán rá, mąjąñúų gá'ne nę. Ąnguįn', phú nando' jąyą'la'. Xángrą'áan'la'. Xúgíí kixná rí phú máján jamí xtamínų' rí jañii wáa ną'khą ná mikhuíí, naxná nę Aną'ló' tsí ne'ne kųmii ą'guąán. Tsí Aną'ló' nim-i'tsú tsíxti'khuu xó ja'niį xómá ą'guąán, ni má' tsíbąñįį' xómá nákua. Aną'ló' ne'ne rí mągumáa'ló' mbųjú gąjmąá majñųų ajngáa gakon, numuu rí xkua'nii ndiyoǫ ikhaą, kajngó mąnindxą'ló' įjiįn tsí ginuu jayu. Ikhaa numuu rú'khuęn, ąnguįn', tsáan' phú nando' jąyą'la', xúgiáan' ikháan'la' gí'maa rí mų'gíi ña'wanla' kajngó mųdxawíínla' rí nithánla'. Xá'chą'la' guéño rí mųthąnla', jamí xáji'náa'la' nachą guéño. Numuu rí xąbǫ

tsí naji'náa guéño, tsínii rí máján xómá rí nandoo Ana'ló'. Ikhaa jngó, guni'ñáá ronela' mbá xúgíí inii rí xkawe', rí gatíí guéño ná akian'la'. Jamí gone waba mijnála' kajngó magoo mudrígúla' ajngáa rawuun Ana'ló' rí wa'du má' ná xoxta'la', rí gí'doo tsiakhe rí ma'ne jríñaá'la'. Ra'khá mbájndi má' indoó rí mudxawíínla' ajngóo Ana'ló', rí gí'maa rí mone mbáníila' ne mangaa. Xí indoó má' nudxawíínla' jamí tsíne mbáníila', nune nduwa mijná má' ikháan'la'. Numuu rí tsí indoó má' nadxawuun ajngóo Ana'ló' jamí tsí'ne mbánuu ne, ikhaa ja'nii xómá xabo tsí indoó má' nayaxuu inuu ná iya niwan, jamí ído wámboo niyaxe mínee', a'khuen nakee jamí nacha má' imbumuu xáne ja'nii inuu. Xómá' tsí na'gíi idxuu rí madxawuun mújúun ajngóo Ana'ló' rí phú máján, rí na'ne jáwáan'ló' rá, phú gagi gáxtáa asndo náá má' rí gá'nii, xí tsímbumuu rí na'thán ne, jamí na'ne mbánuu má' xú'khuen rí nidxawuun. Xí mbáa najumuu rí phú máján xó rí na'ne mbaa Ana'ló' jamí tsíñawuun rawuun, na'ne nduwa minee' má' ikhaa, jamí ndaa nitháan numuu rí na'ne mbaa Ana'ló'. Tsí gakon rí máján xó rí na'ne mbaa Ana'ló', jamí na'ne rí naniguu' Tátiáló' Mikhuíí ñajuun tsíge': tsí nambáñúú ijínxuá'a jamí go'óxuá'a ído rí nda'ñúu. Xú'khuen má' rí nañawan mínee' rí maxá'nii rí xkawe' rí none xabo ná numbaa ríge'. Anguin', tsáan' nanimba'la' juyaá Tátiáló' Jesukrísto, tsí phú ithaán gí'doo numuu, ragí'maa rí mura'wíinla' xabo tsí mone ngajuúnla'. Gajuma'la' rí ná nagimbáan'la' a'khuen iganú mbáa xabo tsí phú gí'doo, gída' ajwan' mojmo' jndi ná ñawúun jamí phú mitsaan xtíñuu. Awúun má' rú'khuen iganú mbáa xabo tsí ngínáa mangaa, júwuun xtíin rí phú wayuu. Jamí gajuma'la' rí phú none ngajwaála' tsí mitsaan xtíñuu jamí nutháanla': <<Táta, ara'ún ná xíle rí máján wáa gejyo'>>, xómá' tsí ngínáa nuthaánla': <<Ikháán, ariajún má' a'khuen o ara'ún mbayíí mbo'>>. Á ra'khá nura'wíinla' xabo tsí mone ngajuúnla' rí xkua'nii enela' rá. Jamí nanindxa'la' xómá xabo ñajun tsí tsírajwa' mbé'tháán gajmaá numúú mbá xúgíin xabo. Anguin', tsáan' phú nando' jaya'la', gudxawíínla' rí mathan'la': Ana'ló' nira'wíin xabo tsí ngíníi ná numbaa ríge', kajngó manindxúun xabo tsí phú nanimbuún juyáá Jesukrísto, jamí rí manújngáan manindxúun xabo tsí na'thán ñajúún Ana'ló', rí nixuda minee' má' gajmaá numúú tsí nandúún juyáa. Xómá' ikháan'la', nuñuúla' tsí ngíníi asndo xó rí ndaa

numúu̱. Á ra̱'kháa xa̱bo̱ tsí phú guá'dáá none̱ ngínáa'la' jamí nagó judáan'la' ga̱jma̱á tsiakhe̱ ná gu'wá ñajun rá dxe̱'. Á ra̱'khá ikhii̱n nuthan xkawi̱í' mbi'yuu Jesús tsí ña-juun ña̱'ñala' rá dxe̱'. Phú máján má' e̱ne̱la' xí gakon rí no̱ne̱ mbáníila' xtángoo rí phú i̱tha̱án gí'doo numuu, xómá ka̱ma na'thán ná ajngáa rawuun Ana̱'ló': <<A̱gaa' xtayáá xa̱bo̱ numbaa ga̱jma̱a̱' xómá nandaa' xtaya mina̱' ikháán.>> Jamí xí nu̱ra'wíin-la' xa̱bo̱ tsí mo̱ne̱ nga̱ju̱únla' rá, gí'máa'la' a'khán ná inuu Ana̱'ló', numuu rí tsíne̱ mbáníila' xtángoo rú'khue̱n. Numuu rí tsí na̱ju̱mu̱u̱ rí na'ne mbánuu xúgíí xtánga-woo Ana̱'ló' jamí tsí'ne mbánuu̱ maske asndo mbóó rí na'thán ne̱, gí'maa̱ a'khán rí tsí'ne mbánuu̱ ne̱ xúgíí. Numuu rí Ana̱'ló' ni'thán: <<Xátha̱ba̱a̱' ga̱jma̱a̱' tsí ra̱'kháa a̱'gia̱a' o a̱jmba̱a' ñajuun>>, jamí ikhaa̱ má' ni'thée̱n mangaa: <<Xáta̱xíya̱a̱ xa̱bo̱.>> Kajngó xí tsíthabáa' ga̱jma̱a̱' tsí ra̱'kháa a̱'gia̱a' o a̱jmba̱a' ñajuun, jamí nataxíya̱a̱ xa̱bo̱ rá, gí'máá a'khán rí tsíthane̱ mbánií xtángawoo Ana̱'ló'. Ikhaa jngó, gu̱tha̱nla' jamí ga̱juwala' xómá gí'maa rí ma̱ju̱wá tsí mi̱tra̱jwa̱' numúú ga̱jma̱á mbá xtángoo rí na'ne jáwíin xa̱bo̱ ná awúun a'khán. Numuu rí ído̱ gára̱jwa̱' Ana̱'ló' ga̱jma̱á numúú xa̱bo̱, ma̱ñáwíin a̱kuii̱n ja'yoo̱ xa̱bo̱ tsí niñáwíin a̱kuii̱n ja'ñúú xa̱bo̱. Tsí nañáwíin a̱kuii̱n, ma̱'ngo̱o̱ ído̱ rí mi̱tra̱jwa̱' numuu̱. A̱nguin', tsáan' nanimba̱'la' ju̱ya̱á Jesús, xí mbáa na'thán: <<Ikhúún nanimbo̱' ja'yoo Ana̱'ló'>>, jamí nda̱a̱ nitháan rí máján i'nii̱, náá lá gámbáyúu̱ rú'khue̱n rá. Á ma̱'ngo̱o̱ má' rí xkua'nii inimbo̱o̱' ma̱'ne jríya̱a̱' rá dxe̱'. Ga̱ju-ma̱'la' rí mbáa dxájwaló', xa̱biya̱ o a̱'go̱, nda̱a̱ xtíñuu̱ jamí nda̱a̱ rí mi̱khui̱ tsitsíí, jamí mbáa tsí ikháan'la' na'thúu̱n: <<Ana̱'ló' gá'ne tsakun rámáá ná mi̱dxu̱u'. Athúwaan' xtíñaa' rí mika wáa jamí atse'tsolá ma̱gi̱'maa'.>> Nda̱a̱ rí gámbáyúu̱ ajngáa rú'khue̱n, xí tsíxnúu̱ rí nda'yóo̱. Xkua'nii má' mangaa, tsí i̱ndo̱ó má' na'thán rí nanimbo̱o̱' ja'yoo Ana̱'ló' jamí tsí'nii̱ rí máján, nda̱a̱ mbá jayu má' numuu na'thée̱n rí nanimbo̱o̱' xú'khue̱n rá. Ágá'ne xí mbáa ma'thán: <<Tikhuun nanimbu̱ún juyáá Ana̱'ló', xómá' i̱'wíin none̱ rí máján.>> Xómá' ikhúún na̱tha̱nlo̱': Ikháán ma̱xáxóo ma̱ta̱sngajmú' rí ninimba̱a̱' xtayáá Ana̱'ló' xí tsíthane̱ rí máján. Xómá' ikhúún ma̱goo ma̱sngajmáa' rí nanimbo̱'

jaẏọọ Anạ'ló' gạjmạá majñụụ rí máján nạnẹlọ'. Khá nanimbạạ' má' rí mbáwíi tsí ña-juun Anạ'ló' xtáa rá. Phú máján má' ithanẹ rí xkua'nii rá, asndo gíñá guéen má' nanim-bụún rí xkua'nii mangiin, jamí asndo nagua'iịn rí namíñúụ. Xánindxạạ' xạbọ tsí júgoo inuu. Á nandaa' mạsngạjmáa' rí gakon rí rạgí'doo numuu rí nanimbọọ' xạbọ tsí ndạạ rí máján e'ne dxẹ'. Nákhí rí tátạ xị'ñáló' Abrạám nixnáxiị ạdéẹ Isáák ná tsụdụụ jạrngọxẹ itsí, ạ'khuẹn ni'thán Anạ'ló' rí xạbọ tsí májáan ạkuịin ñajuụn. Nakujma nguáná má' mbụ'yáálό' rí Abrạám nisngájmeẹ rí nanimbọọ' ja'yoọ Anạ'ló' gạjmạá majñụụ rí ni'niị. Jamí gạjmạá majñụụ rí ni'niị, nigajạạ asndo nijrá'áan rí jañii ạkuiịn ná inuu Anạ'ló'. Xkua'nii nimbánuu ajngáa rawuun Anạ'ló' rí na'thán: <<Ninimbọọ' Abrạám ja'yoo Anạ'ló', rú'khuẹn jngó ni'thán Anạ'ló' rí májáan ạkuịin.>> Jamí ne'ne mbi'yuụ <<Iyan-gạjwẹe Anạ'ló'>>. Kajngó gạfra'ạ' májánla' ríge': Anạ'ló' na'thán rí májáan ạkuịin mbáa xạbọ gạjmạá majñụụ rí máján na'niị, rạ'khá ịndọó gạjmạá majñụụ rí nanimbọọ'. Xkua'nii má' ninimbọọ' Raáb mangaa, ạ'gọ tsí nịngụjwạ mínạ' nákhí wajyúú. Anạ'ló' ni'thán rí májáan ạkuịin gạjmạá majñụụ rí máján ni'niị: Nịgruịgúụn ná go'wóọ xạbọ tsí nigó gúñạmaa xuajen Jerikó, jamí nimbáñúụ rí mạgạjnáạ ngụ'wạ gạjmạá ịmbạ jam-bạạ. Xómá rí mbáa xạbọ tsí nijáñuu, nándạạ xụụ', xkua'nii má' ja'nii rí nanimbọọ' xạbọ mangaa, xí ndạạ rí máján i'niị, ndạạ mbá jayu numuu rí nanimbọọ'. Ạnguịn', tsáan' nanimbạ'la' juyạá Jesús, xánindxạ' xúgiáan'la' xạbọ tsí nusngáá, numuu nduyạámála' rí ịthạán gakhẹ mịtrạjwạ' numa ikháan'xọ'. Numuu rí mbá xúgiáan'ló' nạngrạ'áan'ló' mba'a nothon. Xí xtáa mbáa tsí nạ'ngọọ nạñạwụụn rawuun ídọ rí na'thán, xạbọ tsí nijrá'áan má' ñajuun tsú'khuẹn, jamí nạ'ngọọ má' rí na'thán ñajun mineẹ' mbá xúgíị mangaa. Ídọ rí nụxụ'dáa'ló' xạ' ñuu rawuun guáyọ, nạ'ngạ'ló' nụxụ'máạ mạ'geẹ ná nandaló' rí mạ'geẹ, jamí nạ'ngạ'ló' nụxmạtrígaạ mbá xúgíị. Gụyạxịíla' gu'wá rguwa mbạ'wọ rí nạkạ ná inuu iya ạphạ mangaa. Mbá ixẹ lájwíin jayá ikhoo nẹ rí nạkạ nẹ ná nandoo xạbọ tsí nạkạ jayóo nẹ, maske má' phú gakhẹ irmajnguạ' nẹ gíñá. Xú'khuẹn má' ja'nii rí rạjụụn xạbọ mangaa, mbá xuwi lájwíin ñajuun nẹ, jamí phú mbạạ rí nạ'n-gọọ nẹ na'ne. ¡Rạ'khá tháán mbạạ júbạ ikha e'ne mbá lájwíin rị'yụụ agu rí nakhatịyọọ'!

Rí rąjụụn xąbọ xómá rị'yụụ agu ja'nii nẹ. Kąma nẹ ná xuyuụ, jamí phú gí'doo nẹ tsi-akhẹ rí mą'ne nẹ mba'a inii rí rąmáján, xú'khuẹn má' na'ne ma'chúu nẹ mbá xúgíí xuyuụ. Ndayá skịyụụ' nẹ ná nakha jámuu agu, jamí mbá xúgíí mbi'i na'ne ma'chúu nẹ mbi'yuụ. Tsí xąbọ numbaa ną'ngọọ na'ne másuụn jamí naxná ñajúụn mbá xúgíí inii xụkú xáná tsí namangụún, xụkú xna, xụkú tsí nụxmątha mijná jamí xụkú tsí gatiin ná awúun iya ąphą. Xómá' rí rąjụụn xąbọ rá, nimbáa tsí'ngọọ gá'thán ñajuun nẹ. Mbá rí xkawẹ' rí ndąą xó mụwajún thịínló' ñajuun nẹ, jamí gajnịí thana rí nągụdíin xąbọ ná awúun ajngáa rí nagájnuu e'ne nẹ. Gąjmąá rąjwąn'ló' nagájnuu ajngáa ná rawanló' rí mọ'nẹ mbąą Anạ'ló' Mikhuíí, xú'khuẹn má' rí mụ'xná ma'íinló' xąbọ tsí nịgụma kụmii xómá ja'nii Anạ'ló'. Mbóó má' ná rawanló' nágájnuu ajngáa rí máján jamí ajngáa rí xkawẹ'. Ąnguịn', rągí'maa mą'ne rí xkua'nii. Á mągoo mągąjnúu iya ríná ná iduu iya rí thawuun dxẹ'. O mągoo maxná xndú rí mbi'yuu aseitúnạ mbá ixụụ ígọ dxẹ', o ígọ mbá ajmụụ úbą dxẹ'. Mąxáxóo ąnguịn'. Xkua'nii má' mangaa, mąxáxóo mągąjnúu iya ríná ná iduu iya rí thawuun. Á xtáa mbáa tsí gakon rí nda'yoo jamí nafro'ọọ náá rí máján mą'ne ná majñą'la' dxẹ'. Gasngájmeẹ nẹ gąjmąá majñụụ rí gamakuiị jamí rí tsíkúxẹ míneẹ' ídọ rí na'niị rí máján. Jamí xí ịndọó má' tsixígụ' jamí siąn' rígą ná awúun ąkiąn'la' rá, mụxúthąn tsi'yála' rí nąmąñala' jamí mụxúnẹ nduwala' rí nọnẹ nuwiinla' rí gakon. Numuu rí xąbọ tsí xkua'nii ịmąñúú rą'khá ná inuu Anạ'ló' ị'khą rí nąmąñúụ, rí ná numbaa rígẹ' ị'khą nẹ, ná jụmúụ má' ikhiịn jamí ná inuu gixąą. Ikhaa jngó, ná rígą tsixígụ jamí siąn', ikhín má' rígą xkujndu jamí mbá xúgíí inii rí xkawẹ' mangaa. Xómá' xąbọ tsí nduyáá jamí nafru'ụún rí nạ'khą ná inuu Anạ'ló' rá, tsíniị rí xkawẹ', tsítsąñúụ' gajmíị xąbọ, gamakuụn, májáan ąkuíịn, phú nañáwíin ąkuíịn juñúụ tsí ngínii, gatíí rí máján nunịi, tsíra'wíịn xąbọ tsí monẹ ngąjúụn jamí nąnguá ąjmą inúụ. Tsí nandúún mąrịgá rí tsímáá ná numbaa rígẹ', nụmbąyíị rí mąxátsąñụú xąbọ. Asndo xó rí nudiị tsígoo rí máján ja'nii, kajngó monẹ xąbọ rí nandoo Anạ'ló'. Náá lá ị'khą xkujndu jamí siąn' rí rígą ná majñą'la' rá. Ná awúun má' ąkiąn'la' jamí ná awúun má' rí phú nąniguą'la' mụgua'dáála'. Phú nąniguą'la' rí mụgua'dáála' rí rígą ná tsụdụụ

numbaa jamí tsígua'dáála' nę. Rą'khá tháán naxíguą'la' rí asndo nų̱radíinla' xąbǫ, ni má' xú'khuęn tsígua'dáála' rí nandala'. Nǫnę xkujndula' jamí nątsąñą'la'. Rąkuá'dáála' numuu rí tsíndą'ą́ála' Anąl'ló'. Jamí ídǫ rí nų̱ndą'ąla', tsídrį̱gúla' rí nandala' numuu rí tsíndą'ąla' nę rí mąjmaa ná nda'yoo, rí nų̱ndą'ąla' nę mų̱tsį̱jmála' ná rí nąnį̱guą'la' ikháan'la'. ¡Rą'khá xąbǫ tsí nandúún juyáá į̱ndǫó Anąl'ló' ñajwanla'! Á tsíyą́ála' rí xąbǫ tsí nandoo guéño ja'yoo rí rígą ná numbaa, tsíyoo rí mąmbáxų̱ų̱' gąjmáą Anąl'ló' rá dxę'. Ikhaa jngó, asndo tsáa má' tsí nandoo guéño ja'yoo rí rígą ná numbaa, tsímbáxų̱ų̱' gąjmáą Anąl'ló'. O nąjų̱mą'la' rí ndąą numuu rí na'thán ná ajngáa rawuun Anąl'ló' dxę': <<Phú nandoo Anąl'ló' ja'yoo Xę' rí kuą'ą́n ná xǫxtą'ló', jamí mbáwí̱ ikhaą nandoǫ rí mągaló' ju'yáą.>> Xómá' ikhaą phú mbąą rí máján naxnáló', rí ni rąjá'yaló'. Ikhaa jngó na'thán ná ajngáa rawuun Anąl'ló': <<Anąl'ló' nąwęję thų̱ún xąbǫ tsí nų̱xų̱xí mijná, xómá' tsí nų̱xrígú mijná rá, naxnúų̱ rí máján, rí ni rąjá'ñúų̱.>>Ikhaa numuu rú'khuęn, gų̱nį̱'ñá mijnála' rí ma'thán ñajwanla' Anąl'ló'. Gąwajún gúkuála' kajngó mą'ngą'la' inuu gixąą, ą'khuęn rí ikhaą magáyuų̱ mą'geę į̱mbą janíí. Ą̱guwala' ná inuu Anąl'ló', jamí ikhaą maxu'ma minęę' ná inala'. Xąbǫ a'khán, gų̱nį̱'ñáá rǫnęla' a'khán. Tsáan' ąjmą ąkiąn'la', į̱ndǫó má' Anąl'ló' gájų̱mą'la' jų̱yąá. Gų̱yą́ála' rí mingínáa'la', gų̱mbį̱yą'la' jamí gątájwíin ąkiąn'la'. Gų̱nį̱'ñáá rų̱ndų̱'wąla', gų̱mbį̱yą'la'. Gų̱nį̱'ñáá rajuwala' gagi, gąjuwa jínála'. Gų̱xrígú mijnála' ná inuu Anąl'ló', jamí ikhaą mą'nii̱ rí phú mągų̱ma mbąán'la'. Ą̱nguį̱n', nimbáa mąxá'thán tsų̱dų̱ų̱ nimbáa xąbǫ. Xí mbáa na'thán tsų̱dų̱ų̱ mbáa xąbǫ o na'théę̱n rí rąmáján i'nii̱ mbǫ', na'thán tsų̱dų̱ų̱ xtángawoo Anąl'ló' jamí na'théę̱n rí rąmáján nę. Xí ikháán narathán rí rąmáján xtángawoo Anąl'ló', tsíthanę mbánií rí na'thán nę, rí nathanę minąą' mbǫ nąrąjwą' numuu nę. Į̱ndǫó má' mbáwíi tsí nixná xtángoo ñajuun mbǫ nąrąjwą', jamí į̱ndǫó má' ikhaą mągoo mą'ne jáwí̱n o maxná ma'í̱n xąbǫ. Xómá' ikháán rá, tsáa ñajwaan' kajngó nątrąjwą' numuu xąbǫ jų̱mąą' ró'. Gų̱dxawíínla' rígę', tsáan' nų̱thąnla': <<Xúgę' o gátsíí mų̱'guą́ló' xuajen rú'khuęn o rígę', mąjuwaló' mbá tsigu ikhín, mų̱ngų̱jwą ngaą́ló' jamí mų̱'daaló' mbúkhąą.>> Jamí nitsíyą́ála' dí gąrį̱gá gátsíí, ni má' tsíyą́ála' xí xóó juwala'. Dílá

ñajuun mbi'yala' rá. Xómá rụjmbạa' rí nakujma mbégo jamí ịmbrúma nándạa nẹ xkua'nii ja'ñáa'la'. Ịwạá máján rí xá'nii gúthạnla': <<Xí Anạ'ló' nandoo, majuwaló' jamí mọ'nẹló' ríge' o mọ'nẹló' rí ñú'ún.>> Xómá' ikháan'la' phú nạnịguạ'la' rí mụthạn tsi'yála', asndo xó rí ikháan'la' ịthạn ñájwíín mbi'yala' ja'nii. Rạmáján ẹnẹla' rí nọnẹ tsi'yála' xkua'nii. Ikhaa jngó, tsí nda'yoo má' náá rí máján mạ'ne jamí tsí'nii, xtáạ ná awúun a'khán. Gụdxawíínla' ríge', tsáan' phú kua'dáála': gụmbiyạ'la' jamí gụndxạ'wạ jínála', numuu rí inu má' mạ'khạ mbi'i rí mụmínịíla'. Na'ga má' mbá xúgíí rí mitsaan kua'dáála', jamí na'phọ má' ñụụ ruxi xtíñala' rí phú kuitsúun. Nạ'khạa má' iyoo mbúkhạạ ajwạn' mọjmọ' jamí mbúkhạạ ajwạn' mi'xá rí phú kua'dáála'. Rú'khuẹn ma'thán rí rạmáján nẹnẹla' ídọ gárạjwạ' Anạ'ló' numala', jamí matsikháan'la' nẹ. Nẹnẹ matíila' rí mụgua'dáála' awúun mbi'i rí inu má' mạmbá numbaa ráan'. Ikháan'la' túnẹ numịila' xạbọ ngínii tsí nịñajun ná mbayala'. Gụdxawíínla' rí nandxa'wá ra'a numa rú'khuẹn ná inuu Anạ'ló' tsí gí'doo mbá xúgíí tsiakhẹ, jamí ikhaạ nidxawuụn má' a'wúún yumbáá tsú'khuẹn. Ikháan'la' phú nijuwa májánla' ná numbaa ríge'. Nitháan ndạạ rí ndi'yála', jamí nẹnẹla' mbá xúgíí rí nạnịguạ'la'. Ni'ngáan'la' mẹnda'kho xómá xụkú tsí nitsí'yoo náá mbi'i mạjạñúụ. Nịrígula' ajngáa wa'a tsụdụún tsí ndạạ a'khúún jamí nịradíịnla', xómá' ikhiịn túxụdạạ' ñawúụn rí mụmbạyú mịjnẹẹ. Ikhaa jngó, ạnguịn', gạ'ngọọ ạkiạn'la' asndo mbi'i rí mạ'khạa Tátạ Jesukrístọ. Gụyạxẹla' xómá e'ne xạbọ tsí nañajun xanáá, gí'thụụn má' xú'khuẹn rí maguụ rí mitsaan nijmạạ ná tsụdụụ jụbạ' rí ni'dịi, jamí gí'thụụn má' xú'khuẹn rí maganú mbi'i rí mạ'khạa ru'wa. Xkua'nii má' góne mangáan'la', gọnẹ gakhẹ ạkiạn'la' jamí mạxá'ne ní'ngạ'la' rí mụwa'thịínla', numuu rí inu má' mạ'khạa Tátạ Jesukrístọ. Ạnguịn', nimbáa mạxá'ne xkujndu gạjmạá numuu nimbáa, kajngó mạxákujma a'kháanla' gá'ne Anạ'ló'. Gụyạála' rí inu má' xtáạ ná rawuun xkrugua tsí marạjwạ'. Ạnguịn', guyạxịíla' xkrịda xó rí nimínịí jamí xó rí nenẹ gakhẹ ạkuịín tsí nịrawí jngạa ajngóo Anạ'ló' wajyúú. Ikhááanló' nạjụmạ'ló' rí phú gagi júwạ' tsí nạ'ngọọ ạkuịín rí mụmínịí. Ikháan'la' nịdxawíín xáne nị'ngọọ ạkuịin Jób rí mamínụụ' mẹnda'kho, jamí nduyạá mála' rí ndạwạá phú mbạạ rí máján

nijanáa ne'ne Ana'ló'. Numuu rí Ana'ló' phú nañáwíin akuiin jamí phú mbaa akuiin. Anguin', nando' gáthan'la' imba rí gí'doo numuu: ído rí nuthanla' numuu asndo dí má', xúxu'dáa'la' Ana'ló', ni má' xúthanla' mbi'yuu asndo nimbá rí riga ná numbaa. Rí nuthanla' rí monela', ikhaa má' gónela'. Xí nuthanla' <<manẽ>>, gonela'. Xí nuthanla' <<maxánẽ>>, xúnela'. Kajngó maxákujma a'khánla' gá'ne Ana'ló'. Xí xtáa mbáa tsí gí'doo ga'kho ná majña'la', ga'thán jáñuu Ana'ló'. Xí xtáa mbáa tsí nadxuu, ga'sieen ajmúú ná inuu Ana'ló'. Xí xtáa mbáa tsí najáñuu ná majña'la', gandxa'wúun xabo buanuu tsí juya idxúún mbo nagimbíin. Kajngó muthán jáñíi Ana'ló' gajmaá numuu, jamí mutsua'aan aséite gajmaá mbi'yuu Táta Jesukrísto. Xí nuthan jáñíi Ana'ló' gajmaá mbá jañii akuíin, ma'nii akuiin tsí najáñuu, jamí Ana'ló' ma'ne rí matuxii. Jamí xí ni'nii a'khán rá, Ana'ló' ma'ne mbaa akuiin ja'yoo. Ikhaa numuu rú'khuen, mbámbáa gá'ne maphú a'khúun ná inuu imbaa, jamí mbámbáa gá'thán jáñuu Ana'ló' gajmaá numuu imbaa, kajngó ma'nii akian'la'. Xí mbáa xabo tsí májáan akuiin na'thán jáñuu Ana'ló', phú gí'doo tsiakhe tsakuun rí na'nii. Garmá'áan akian'la' juyaá Elías, tsí niguwí jngaa wajyúú, ikhaa ninindxuu mbáa xabo numbaa xómá ikháánló' jayu. Nákhí ni'thán jáñuu Ana'ló' rí maxáxnúu ru'wa, táxnúu ru'wa atsú tsigu itikhu. Ndawaá a'khuen ni'thán jáñuu Ana'ló' mbujúu rí maxnúu ru'wa, a'khuen nixnúu ru'wa ne'ne Ana'ló', jamí nixnáa xndúu mbá xúgíí inii rí nda'ya ná inuu jubaa'. Anguin', tsáan' nanimba'la' juyaá Jesús, xí mbáa tsí ikháan'la' naniñuu jambaa rí gakon, jamí imbaa na'ne rí matangaa, guyaála' rí tsí nambáyúu xabo a'khán rí matangaa akuiin jamí maniñuu ra'ne a'khán, na'nii rí majríyaa' rí majañúu jamí na'nii rí Ana'ló' ma'ne mbaa akuiin ja'yoo mba'a a'khán rí ni'nii.

C.2 Chinantec Full Text

ISO 639-3 code of language: [cso]

Title of the text: Sí² Quioh²¹ Santiago. JÚ¹ CHÚ³² QUIOH²¹ JESÚS TSÁ² LɬŃ³ CRISTO (El Nuevo Testamento en el chinanteco de Sochiapan)

Cited as: La Liga Bíblica. 2009. Sí² Quioh²¹ Santiago. JÚ¹ CHÚ³² QUIOH²¹ JESÚS TSÁ² LɬŃ³ CRISTO (El Nuevo Testamento en el chinanteco de Sochiapan), 525-33. La Liga Bíblica. <Accessed: 12 June 2012>. http://www.scriptureearth.org/data/cso/PDF/00-WNTcso-web.pdf

Text provenance: The actual text used and processed was the SFM file received from Chinanteco de Sochiapan language development and Bible translation team. This text is included in the publicly available work as indicated in the work is cited. Date of acquisition of the texts from the team was: 13. June 2011. __(do I need to take out the *? do I need to take out the double spaces?)__

What I did to the text before using it in comparisons: Section headers were removed. Chapter and verse numbers were removed.

Copyright holder as indicated: SIL International and the language development team. Used by written permission.

The Text: Jná¹³ la³² Jacobo, tsá² lɬm³ jná¹³ jan² *tsá² má²dí¹hlánh¹ joh¹ Dió³² jɨ³ Jesucristo Tɨ³² Juo¹³ dí², juanh³² jná¹³: “Hia² hnoh²”, tá¹ quia³tún³ nió³ hnoh² tsá² *Israel, tsá² má²ná¹yanh³² náh² tá¹ cáun² hngá¹máh³. Hnoh² reh², ma³hiún¹³ hnoh² honh² lɨ³ua³ cáun² hi³ quiunh³² náh², quí¹ la³ cun³ hi³ má²ca³lɨ³ ñíh¹ hnoh² jáun² hi³ tɨ³ jlánh¹ bíh¹ re² lɨ²tɨn² tsú² hi³ jmu³ juenh² tsɨ³, nɨ́ juáh³ zia³² hi³ cá² lau²³ ca³tɨ²¹ hi³ taunh³² tsú² jáun² ta²¹. Hi³ jáun² né³, chá¹ hnoh² cáun² honh², hi³ jáun² lɨ́³ lɨ³tɨn² hnoh² re² hi³ jmúh¹³ náh² juenh² honh², hi³ jáun² hnoh² lɨ́³ lɬm³ náh² tsá² má²hún¹ tsɨ³, tsá² má²ca³hiá² ca³táunh³ ca³la³ tán¹ hián² cu³tí³, la³ cun³ tsá² tiá² hi³ lɨ³hniauh²³ hí¹ cáun² ñí¹con² yáh³. Lɨ³ua³ jan² hnoh² tsá² tiá² re² má²jniá³ jmɨ́ honh² náh², mɨ́ náh² ñí¹con² Dió³², hi³ jáun² lɨ́³ hián¹³ náh², quí¹ hí³ bíh¹ cue³² ca³la³ hi³ lɨ́ má²tú² má²ziáun²³ ñí¹con² ca³la³ jɬm³² tsáu², ha³ tiá² jin²³ yáh³ tsú² tsá² hiú² tsá² mɨ³² ñí¹con². Tɨ³la³ hniáuh³² mɨ́³² tsú² hi³ hu²¹ cáun²

tsɨ́³ má¹ná¹, hí¹ cú¹pih²¹ yáh³ tiá² hniáuh³² hu²¹ tun³ tsɨ́³ tsú²; quí¹ nɨ́juáh³ hi³ hu²¹ tun³ tsɨ́³ tsú², jáun² lɨ́n³ tsú² la³jmɨ́ lɨ́³ cu³ jláɨ³ jmɨ́²miih²¹ bíh¹, hi³ hlia³² chí³ tɨ³ hlá² tɨ³ nɨ́². Tsá² la³ hí³ tiá² hniáuh³² yáh³ hi³ cáun² lɨ́ lɨ́n¹³ hi³ hiáuh³ hi³ jmɨ́ cué²¹ jáun² Dió³² Juo¹³ dí²; quí¹ tsá² la³ hí³ dá² cáun² lɨ́ tɨ́² lɨ́ jeinh³² tsɨ́³ tɨ³ hlá² tɨ³ nɨ́² bíh¹. Hi³ jáun² né³, cuɨ́ jmu¹ tsah³ tsá² reh² dí², tsá² tsɨ́juɨ́³, quí¹ cun³ñí¹ hi³ má²ca³ta³zanh¹ tsú² re². Hi³ tsá² hánh³ né³, cuɨ́ jmu¹ tsah³ quí¹ cun³ñí¹ hi³hliá² má²ca³méih³ hi³ quien² tsú², quí¹ tsá² ná¹hánh³ dá² lɨ́n³ la³jmɨ́ lɨ́³ lí¹³ hi³ tiá² má²hɨe² bíh¹. Quí¹ nɨ́ má¹ca³hiá² hiú², hi³ má¹lɨ³² jáun² né³, chei³² lɨ́n³², jáun² lɨ́²quiéin² bíh¹ náɨ², hi³ suh³² siáh³ lí¹³ quioh²¹, jáun² lɨ́ ca³há² ca³nga² bíh¹ hi³ jmɨ́ jniá³ jáun² chú³² lɨ́n³². La³ jáun² bíh¹ quiunh³² uá²jaɨ³² tsá² hánh³, cu³diá²jan² bíh¹ tsá²hín³ tsú² tá¹la³ cuá¹jmu² jáun² tá¹³. Hen³ ma³ jmɨ́ ren² tsá² tion² tsɨ́³ ca³la³ jɨ́³² hi³ quiunh³²; quí¹ nɨ́ má¹ca³nga² tsú² la³jɨ́³² hi³ jáun², hiáuh³ bíh¹ tsú² la³ cun³ hi³ ca³jmú³ jáun² Dió³² jáɨ¹³ hi³ cué³² ñí¹con² tsá² hniau³ dí², hi³ lɨ́³ zian² dí² quionh³ tsá² ca³cah¹³ hí³ jmáɨ¹ quionh³. Tɨ³la³ nɨ́juáh³ ca³chó³² cáun² jmáɨ¹ hi³ hniá¹ tsú² cáun² hi³ tiá² ca³tɨ²¹ né³, tiá² hniáuh³² yáh³ hi³ cáun² lɨ́ lɨ́n¹³ tsú² hi³ Dió³² bíh¹ cá² lau²³ cun³quionh³ hi³ hlah³ jáun². Quí¹ hí¹ cónh³ yáh³ tiá² lɨ́³ hi³ hen² tsɨ́³ Dió³² hi³ hlah³, sa³jun³ cá² lan²³ tsú² tsáu² cun³quionh³ hi³ hlah³. Tɨ³la³ nɨ́juáh³ hi³ hniá¹ tsú² la³ cun³ hi³ tiá² ca³tɨ²¹ né³, jáun² hi³ jáun² má²ja³² ca³la³ tɨ³ ñeh² hñu³ tsɨ́³ hnga² bíh¹ tsú²; quí¹ hñu³ tsɨ́³ hnga² bíh¹ tsú² dí¹quian¹ hi³ jáun². Hi³ nɨ́ má¹ca³lɨ́n¹³ tsú² jmu³ la³ cun³ hi³ má²hniá¹ jáun² jmu³ né³, má¹jáun² má²lɨ́³ tso³ bíh¹. Jáun² nɨ́ má¹ca³lɨ³ pin³ tso³ tán¹ hián² cu³tí¹³ né³, jáun² má¹jáun² má²jún³ bíh¹ tsú² ñí¹con² Dió³². Hnoh² reh², tsá² hnau³ jná¹³ lɨ́n³², ha³ lɨ́² lɨ́ cuɨ́ lɨ³can² hnoh²; quí¹ ca³la³ jɨ³lɨ³² hi³ chu²¹, jɨ³ la³jɨ́³² hi³ quien² ca³la³ tán¹ hián², cáun² lɨ́ cue³² bíh¹ Dió³² Jméi² dí², Tsá² cuá³ hñu³mɨ³cuú². Hí³ bíh¹ Tsá² lɨ́n³ mí¹zioh²¹ quioh²¹ la³jɨ́³² joh¹ hi³ jniá³ jáun² tɨ³ chi³cuú²; Dió³² Tsá² lɨ́n³ la³ má²lɨ́n³ jáun² yáh³. Tɨ³la³ Tsá² hí³ má¹ná¹, tiá² zan² yáh³ la³jmɨ́ za² joh¹ hi³ ja³² jáun² chi³cuú², hi³ cáun² lɨ́ jmu² hính¹³ tɨ³ hlá² tɨ³ nɨ́². Hí³ bíh¹ Tsá² ca³lɨ́n¹³ hi³ ma³jniau² dí² hi³ hmaɨ²¹ cun³quionh³ jú¹ tson² quioh²¹. Cun³ñí¹ hi³ jáun² né³, má²láɨ³ dí² tsá² má²ná¹chan¹ ñí¹con² tsú² ja¹ quioh²¹ la³jɨ́³² hi³ ca³jmú³ tsú² jáun², la³jmɨ́ má²ná¹chan¹

jáun² la³jɨ́³² hi³ lau³² la³ñí¹. Hi³ jáun² né³ reh², tsá² jlánh¹ hnau³ jná¹³, hniáuh³² lɨ³ ñíh¹³ náh² hi³ tianh¹³ náh² hua³jan²¹ hi³ náɨh¹ náh² jáɨ¹³ hi³ hleh³² tsáu²; tɨ³la³ tiá² hniáuh³² yáh³ hi³ la³juɨ³² hléh¹³ hnoh² má¹ná¹, sa³jun³ hniáuh³² hi³ la³juɨ³² má²míh³ honh² náh², quí¹ tsá² míh²³ tsɨ́³ cun³ tiá² lɨ́³ bíh¹ jmu³ la³ cun³ hi³ tɨ³² tsɨ́³ Dió³². Hi³ jáun² bíh¹ hniáuh³² cháh¹³ hnoh² tɨ³ có³² la³jɨ́³² hi³ tiá² jɨ² hi³ má²chí¹mɨ³² jáun² honh² hnoh², la³ má²quionh³ jɨ³lɨ³² hi³ hlah³ hi³ jlánh¹ má²ca³lɨ³ hliáun³ jáun²; tɨ³la³ hi³ nio² re² honh² bíh¹ hnoh² cuéh¹ náh² jáɨ¹³ hi³ lɨ́³ lɨ³ quien² jú¹ tson² hi³ má²ca³jñí³ jáun² Dió³² hñu³ honh² náh², la³ cun³ jáɨ¹³ hi³ jmu³ hi³ liáun³ náh². Hi³ jáun² hniáuh³² má¹tih²¹ bíh¹ hnoh² la³ cun³ hi³ hɨe³² jú¹ tson² jáun², quí¹ nɨ́juáh³ cáun² ti³ lɨ́ naɨh³² náh², jáun² la³ jáun² lɨ́ lɨ́²can² náh² hmóu³² bíh¹. Quí¹ tsá² ti³ lɨ́ náɨ³² jú¹ tson² hi³ tiá² má²tí³² yáh³ tsú² má¹lɨ³² jáun², jáun² tsá² la³ hí³ dá² lɨ́n³ la³jmɨ́ lɨ́n³ jan² tsá² má²lɨ́²jɨ́e³ ñí¹ cun³quionh³ cáun² hu³² bíh¹. Quí¹ nɨ́ má¹lɨ́²jɨ́e³ tsú² lánh³ lɨ́³ ñí¹, jáun² la³juɨ³² tsá²có³ bíh¹ tsɨ́³ tsú² lánh³ lɨ́³ ñí¹ nɨ́ má¹lɨ³² jáun². Tɨ³la³ tsá² taun² re² ñí¹ liei²¹ chu²¹ quioh²¹ Dió³² né³, liei²¹ hi³ jmu² jáun² hi³ lɨ́³ liáun³ tsú², hi³ má²tí³² tsú² re², hi³ tiá² tsá²có³ tsɨ́³ tsú² hi³ náɨ³², jáun² tsá² la³ hí³ bíh¹ jlánh¹ lɨ³ hiún² tsɨ́³ ca³tɨ²¹ la³ cun³ la³jɨ́³² hi³ jmu² jáun². Nɨ́juáh³ zian² tsá² lɨ́n²³ hi³ jlánh¹ re² má²tí³² cuáh³² quioh²¹, tɨ³la³ nɨ́juáh³ cáun² lɨ́ ja³tú² ja³lɨ́²³ bíh¹ ho³ tsú² má¹lɨ³² jáun², jáun² tsá² la³ hí³ cáun² lɨ́ má²can² hnga² bíh¹, hi³ tiá² lin¹ lɨ́²quien² yáh³ hi³ jlánh¹ má²tí³² tsú² jáun² cuáh³². Tɨ³la³ tsá² má²tí³² cuáh³², cáun² hi³ jɨ² hi³ hngó³² ta³ ñí¹ Dió³² Jméi² dí² né³, jáun² tsá² la³ hí³ bíh¹ jmu² la³ lá²: Má²hon³ tsú² tsá¹míh¹ hnáɨ³, jɨ³ tsá²mɨ³ hnáɨ³ nɨ́² siáh³ ja¹ lɨ³ua³ cáun² uu³mí²tsɨ³² hi³ zian² tsú², hi³ hua³hín¹³ tsú² siáh³ hnga² hi³ tiá² ma³quiá¹ jmɨ́²chí³ quioh²¹ cun³quionh³ hi³ zia³² jáun² ñí¹ hué²¹ lá². Hnoh² reh², tsá² tanh²³ náh² ta²¹ Jesucristo Tɨ³² Juo¹³ dí², Tsá² cú² juenh², tiá² ca³tɨn¹ ya³ náh² jmúh¹³ quien² jan², hi³ jan² tiá² quien². Jmú¹³ jáɨ¹³: Nɨ́juáh³ ja¹ ñí¹ ná¹ngɨh³² náh² ca³hi³ jan² tsá² quih³² hmɨh³² chu²¹, hi³ tioh³ siáh³ anillo hi³ lɨ́³ cú¹mí¹niau²¹ cuo² tsú², hi³ tá¹la³ jáun² né³ ca³hi³ siáh³ jan² tsá² tia³mii² quih³² tsɨ́ hmɨh³² tseh¹, tɨ³la³ nɨ́juáh³ hnoh² jlánh¹ ca³ma³quien¹³ náh² tsá² quih³² hí³ hmɨh³² chu²¹, hi³ juoh¹ náh² tsú² la³ lá²: “Ñí³ ñí¹ chu²¹ lá²”; tɨ³la³ tsá² tia³mii² hí³ né³ juoh¹ náh² la³ lá²: “Tɨ³ ó³² cuá²náu² hnú², ho³lá²dá² hué³²

lɨn^{21} lá^{2} ñí^{3}", hi^{3} nɨ́^{1}juáh^{3} la^{3} jáun^{2} bíh^{1} la^{3} jmuh^{32} náh^{2} né^{3}, jáun^{2} má^{2}ná^{1}jmuh^{32} náh^{2} quien^{2} jan^{2}, hi^{3} jan^{2} tiá^{2} quien^{2} bíh^{1} ja^{1} quián^{13} náh^{2} hmóu^{32}, hi^{3} má^{2}ná^{1}chú^{1} ná^{1}ñih^{21} náh^{2} tsáu^{2} hi^{3} hu^{21} hlah^{3} honh^{2} náh^{2}. Hnoh^{2} reh^{2}, tsá^{2} jlánh^{1} hnau^{3} jná^{13} lɨ́n^{32}, niéi^{2} náh^{2} re^{2} jáɨ^{13} hi^{3} juanh^{21} jná^{13} lá^{2}: Dió^{32} má^{2}ca^{3}quianh^{3} tsá^{2} tia^{3}mii^{2} zian^{2} ñí^{1} hué^{21} lá^{2}, hi^{3} jáun^{2} cun^{3}quionh^{3} hi^{3} nio^{2} cáun^{2} tsɨ́^{3} tsú^{2} ñí^{1}con^{2} Dió^{32}, lɨ́^{13} lɨ́n^{3} tsú^{2} jan^{2} tsá^{2} hánh^{3}, ¿tiá^{1} tson^{2}? Tsá^{2} la^{3} hí^{3} bíh^{1} hiáuh^{3} jáɨ^{13} hi^{3} tsa^{3}tiánh^{2} ñí^{1} cuá^{1}quien^{2} Dió^{32}, la^{3} cun^{3} jáɨ^{13} hi^{3} ca^{3}jmú^{3} jáun^{2} Dió^{32} ñí^{1}con^{2} tsá^{2} cu^{3}tí^{3} hniau^{3} hí^{3} dí^{2}. Tɨ^{3}la^{3} hnoh^{2} má^{1}ná^{1}, chin^{23} náh^{2} hua^{3}heih^{21} tsá^{2} tia^{3}mii^{2}. ¿Haun^{13} juáh^{13} chín^{1}dí^{1} tsá^{2} hánh^{3} bíh^{1} tsá^{2} jmu^{2} hian^{2} tsɨ́^{3} hi^{3} quin^{23} hi^{3} quián^{13} hnoh^{2} dúh^{1}, hi^{3} tú^{2} hna^{2} tsú^{2} siáh^{3} ñí^{1}ta^{21}? Hnoh^{2}, tsá^{2} má^{2}ná^{1}láɨn^{1} náh^{2} Cristo, ¿haun^{13} juáh^{13} chín^{1}dí^{1} tsá^{2} hánh^{3} hí^{3} bíh^{1} tú^{2} hión^{32} hi^{3} jmáɨ^{2} tsú^{2} dúh^{1}, hi^{3} jlánh^{1} bíh^{1} chu^{21} jáun^{2}, hi^{3} má^{2}ná^{1}jmáɨ^{2} náh^{2} jáun^{2} ta^{3}né^{32}? Hi^{3} jáun^{2} né^{3}, nɨ́^{1}juáh^{3} cu^{3}tí^{13} ma^{3}tih^{21} náh^{2} liei^{21} hi^{3} quien^{2} jáun^{2} la^{3}ñí^{1}, la^{3} cun^{3} jáɨ^{13} hi^{3} rá^{1}juáh^{3} jáun^{2} ñí^{1} Sí^{2} quioh^{21} Dió^{32}, hi^{3} juáh^{3} jáun^{2} la^{3} lá^{2}: "Hniáuh^{32} má^{1}hno^{1} hnoh^{2} tsá^{2}mɨ^{3}cuóun^{2} renh^{2} la^{3}jmɨ́^{1} hno^{3} náh^{2} hmóu^{32}", jáun^{2} má^{2}ná^{1}jmuh^{32} re^{2} bíh^{1} hnoh^{2} nɨ́^{1}juáh^{3} la^{3} jáun^{2}. Tɨ^{3}la^{3} nɨ́^{1}juáh^{3} jmuh^{32} náh^{2} quien^{2} jan^{2} né^{3}, hi^{3} jan^{2} tiá^{2} quien^{2}, jáun^{2} tso^{3} bíh^{1} má^{2}ná^{1}jmuh^{32} náh^{2}, quí^{1} liei^{21} quioh^{21} Dió^{32} jmu^{2} lin^{1} hi^{3} tiá^{2} jmuh^{32} yáh^{3} hnoh^{2} la^{3} cun^{3} hi^{3} ca^{3}tɨ^{21}. Quí^{1} nɨ́^{1}juáh^{3} jan^{2} tsá^{2} má^{2}tí^{32} la^{3}jɨ́^{32} héih^{32} quioh^{21} liei^{21}, tɨ^{3}la^{3} sa^{3} la^{3} zia^{32} bíh^{1} cáun^{2} hi^{3} tiá^{2} ca^{3}ma^{3}tí^{32} tsú^{2} má^{1}lɨ^{32} jáun^{2}, jáun^{2} má^{2}ren^{2} bíh^{1} tsú^{2} tso^{3}, la^{3}juah^{21} dúh^{1} hi^{3} tiá^{2} lɨ́^{2} ma^{3}tí^{32} hí^{1} cáun^{2} bíh^{1} tsú^{2} héih^{32} quioh^{21} liei^{21} lɨ́^{23}. Quí^{1} Dió^{32} ca^{3}juáh^{3} la^{3} lá^{2}: "Ha^{3} lɨ́^{2} jmú^{2} náh^{2} juón^{1}", hi^{3} ca^{3}juáh^{3} siáh^{3}: "Ha^{3} lɨ́^{2} jngɨh^{3} náh^{2} tsáu^{2}". Jáun^{2} né^{3}, uá^{1}jinh^{1} jan^{2} tsá^{2} tiá^{2} lɨ́^{1} jmú^{2} lɨ́^{1} tsau^{32}, tɨ^{3}la^{3} já^{2} jngɨh^{2} bíh^{1} tsú^{2} tsáu^{2}, jáun^{2} ñí^{1} nɨ́^{2} bíh^{1} tsá^{2}hín^{3} tsú^{2}, hi^{3} tiá^{2} la^{3} lɨ́^{2}ma^{3}tí^{32} yáh^{3} tsú^{2} héih^{32} quioh^{21} liei^{21} jáun^{2}. Hniáuh^{32} hléh^{13} hnoh^{2} jɨ^{3} hi^{3} má^{1}zián^{13} náh^{2} la^{3}jmɨ́^{1} zian^{2} tsá^{2} ná^{1}ñi^{32} hi^{3} chau^{21} jmáɨ^{1} tá^{1}tsɨ^{21} héih^{32} ñí^{1}con^{2} bíh^{1}, la^{3} cun^{3} lɨ́^{3} jáun^{2} héih^{32} quioh^{21} Cristo hi^{3} jmu^{2} hi^{3} lɨ́^{13} liáu^{3} dí^{2}. Quí^{1} tsá^{2} tiá^{2} jmu^{2} juenh^{2} tsɨ́^{3} ñí^{1}con^{2} tsáu^{2}, sa^{3}jun^{3} jmu^{3} yáh^{3} Dió^{32} juenh^{2} tsɨ́^{3} ñí^{1}con^{2} tsú^{2} hnga^{2} nɨ́^{1} má^{1}cá^{2}chó^{32} jmáɨ^{1} hi^{3} ra^{3}tsa^{2} Dió^{32} héih^{32} quioh^{21} tsú^{2}. Tɨ^{3}la^{3} nɨ́^{1}juáh^{3} tsá^{2} jmu^{2} juenh^{2} tsɨ́^{3} ñí^{1}con^{2} tsáu^{2} né^{3}, jáun^{2} tiú^{2}uú^{2} zia^{32} yáh^{3} hi^{3} háɨnh^{13} ñí^{1}con^{2} tsú^{2} nɨ́^{1} má^{1}ca^{3}ta^{3}tsɨn^{1} tsú^{2} héih^{32}.

Hnoh² reh² ¿ha³ dá² jinh¹ quien² hi³ juáh³ tsú² hi³ nio² cáun² tsɾ̈³ ñí¹con² Dió³², nɾ̈juáh³ tiá² lin¹ hi³ chu²¹ jmu² yáh³ tsú²? ¡Cun³ tiá² lɾ̈³ bíh¹ liáu³² hi³ nio² jáun² cáun² tsɾ̈³ tsú²! Jmú¹³ jáɨ¹³: Nɾ̈juáh³ zian² jan² tsá²mɨ³ reh² dí², ho³lá²dá² tsá²ñuh² hi³ tiá² ha¹ zia³², sa³jun³ zia³² bíh¹ hi³ cuh³ tsú² cun³jmá² cun³ jnia³², hi³ má¹lɨ³² jáun² né³, ma³ jan² hnoh² ti³ lɾ̈ juouh³² náh² tsá² hí³ la³ lá²: “Cuánh² cáun² hi³ re² hi³ tɨn²; cuɾ̈ lɨ³chanh³² nú², hi³ cuɾ̈ conh²¹ siáh³ henh¹ nú²”, tɨ³la³ já² hí¹ cáun² yáh³ tiá² hi³ lɾ̈²cuéh³ náh² tsú² má¹lɨ³² jáun², ¿ha³ dá² jinh¹ quien² hi³ juáh³ hnoh² la³ jáun²? La³ jáun² bíh¹ lɾ̈³ hi³ tiá² lin¹ zia³² ñí¹ jmu³ ta²¹ yáh³ hi³ ti³ lɾ̈ juáh²³ tsú² hi³ nio² cáun² tsɾ̈³ ñí¹con² Dió³², nɾ̈juáh³ tiá² lin¹ zia³² yáh³ hi³ jmu² tsú². Hi³ lɾ̈ juáh²³ tsú² jáun² hi³ nio² cáun² tsɾ̈³, jáun² má²lɾ̈³ la³jmɾ̈ lɾ̈³ cáun² hi³ jún¹ bíh¹ jaun³². Jáun² né³, lɾ̈³ zian² tsá² záɨh³² raɨnh²¹ la³ lá²: “Hnú² bíh¹ jan² tsá² nio² cáun² honh², tɨ³la³ jná¹³ né³, lɨ̈m³ ná¹ jan² tsá² jmu² ta²¹ bíh¹”. Tɨ³la³ jná¹³ né³ juanh³²: Ma³li²¹ hnú² ha³ lánh³ rón³² nio² cáun² honh² nɾ̈juáh³ hnú² jan² tsá² tiá² lin¹ zia³² hi³ jmuh³²; hi³ jáun² jná¹³ má¹li²¹ hi³ nio² jáun² cáun² tsɨn³² cun³quionh³ hi³ jmu² ná¹. ¿Hí¹ má²nio² cáun² honh² hnú² hi³ zian² jan² tán¹ Dió³²? Chú³² bíh¹ nɾ̈juáh³ lɨ̈m²³ hnú² la³ jáun². Ja³bí¹ jmɾ̈²chí³ hláɨnh¹ yáh³ ná¹lɨ̈m²³ la³ jáun², hi³ ca³la³ quí² juan²³ bíh¹ hi³ juénh². Hnú², ¡tsá² cáun¹ nú²! Sá¹nɾ̈² cónh³ jmɾ̈ jmu¹ jná¹³ lin¹ hi³ tiá² lin¹ ñí¹ quien² hi³ juáh²³ tsú² hi³ nio² cáun² tsɾ̈³, nɾ̈juáh³ tiá² lin¹ zia³² yáh³ hi³ chu²¹ hi³ jmu² tsú². Jáun² né³, ¿haun¹³ juáh¹³ hnga² hla¹ Há²bran²¹, jméi² dí¹hio³ ñú¹deh³ dí², ca³lɨn³ la³juah²¹ dúh¹ jan² tsá² chun¹ ñí¹con² Dió³² cun³quionh³ hi³ ca³jmú³ tsú² jáun², jmɾ̈ ca³jéin³² tsú² jáun² Isaac jon² ñí¹con² Dió³², hi³ ca³ra³tsɨn² tsú² jáun² ñí¹hiú¹³ míh¹? Jáun² né³, cun³quionh³ la³ nɾ̈² ca³lɨ³ lin¹ hi³ nio² cáun² tsɾ̈³ tsú², ¿tiá¹ tson²? Hi³ jáun² bíh¹ ca³hia³ ca³táuh³ tán¹ hián² cu³tí³ hi³ nio² jáun² cáun² tsɾ̈³ tsú² cun³ñí¹ hi³ zia³² hi³ ca³jmú³ tsú² jáun². La³ jáun² bíh¹ ca³lɨ³tí³ jáɨ¹³ quioh²¹ Dió³² ñí¹ rá¹juáh³ jáun² la³ lá²: “Dió³² ca³heh³ Há²bran²¹ la³juah²¹ dúh¹ jan² tsá² chun¹ cu³tí³ cun³ñí¹ hi³ ca³chá³ tsú² jáun² cáun² tsɾ̈³”. La³ jáun² bíh¹ lɨ³ hi³ ca³lɨn³ tsú² há²mei²¹ joh¹ Dió³². Jáun² né³, cun³quionh³ la³ nɾ̈² má²ca³lɨ³ lin¹ hi³ jun³juáh¹³ cun³quionh³ jmáh³la³ hi³ nio² cáun² tsɾ̈³ yáh³ tsú² lɾ̈³ lɨ̈m³ tsú² la³juah²¹ dúh¹ jan² tsá² chun¹ ñí¹con² Dió³², tɨ³la³ hniáuh³² hi³ zia³²

hi³ jmu² bíh¹ tsú² uá²jaɨ³². Ja³bí¹ la³ jáun² ca³lɨ³ siáh³ ñí¹con² hla¹ tsá²mɨ³ Rahab, tsá² lɨ́ jmɨ́ jmú² jmɨ́ tsau³² hí³ hi³ quí² jéin³² hnga². Dió³² ca³heh³ tsá² hí³ la³juah²¹ dúh¹ jan² tsá² chun¹ cu³tí³ jmɨ́ ca³cué³ tsú² jáun² hñú¹³ ñí¹con² tsá² ca³ñí¹quí¹ ñí¹lian¹³ hí³ juú²co¹ tsú², tsá² zéin¹ hí³ hla¹ Josué, hi³ ca³hɨ́e³ tsú² siáh³ cáun² juɨ³² siáh³ hi³ tsa³tánh¹ tsú² jmɨ́ tɨ³ ñí¹ tsa³tánh¹. Jáun² né³, tiá² lin¹ ñí¹ jmu² ta²¹ yáh³ hi³ ti³ lɨ́ juáh³ tsú² hi³ nio² cáun² tsɨ́³, nɨ́juáh³ tiá² lin¹ zia³² yáh³ hi³ jmu² tsú²; la³jmɨ́ tiá² ta²¹ jmu² ngú³ nɨ́juáh³ hi³ tiá² jmɨ́²chí³ hu²¹. Hnoh² reh², tiá² hniáuh³² hi³ zian² juóun³² tsá² jmu² pí³ hi³ lɨ́n¹³ tɨ³² ja¹ quián¹³ hnoh², quí¹ la³ cun³ hi³ má²né¹ dí² hi³ tɨ³ jlánh¹ bíh¹ huáh² tsɨ́³ héih³² hi³ tá¹tsɨn¹ tsá² ná¹lɨ́n³ tɨ³². ¿Haun¹³ juáh¹³ la³jáɨ³² bíh¹ dí² jmu³² hi³ tiá² ca³tɨ²¹ dúh¹? Tɨ³la³ nɨ́juáh³ zian² jan² tsá² tiá² hleh³² hí¹ cu³ jéin³² cáun² hi³ tiá² ca³tɨ²¹ hléh³², jáun² tsá² la³ hí³ lɨ́n³ jan² tsá² má²ca³hiá² ca³táunh³ tán¹ hián² cu³tí³ bíh¹, jan² tsá² má²tɨn² jmu² re² lɨ́n³² héih³² ñí¹con² hnga². Quí¹ nɨ́ má¹ca³táunh¹³ dí² mí¹ñí² ho³ tsa³cuá¹, jáun² taunh¹³ jáh³ ta²¹; má¹jáun² né³, má²lɨ́³ bíh¹ jmú¹³ dí² héih³² ñí¹con² jáh³. Ja³bí¹ la³ jáun² lɨ́³ siáh³ quioh²¹ mu² cáh¹. Uá¹jinh¹ cáh¹ lɨ́n²¹, hi³ pin³ lɨ́n³² siáh³ chí³ hi³ hlia³², tɨ³la³ cun³ jáun² tsá² cuá¹quian³² mu², tióh³² bíh¹ tsú² jmu² héih³² ñí¹con² mu² jáun² hi³ tsó³² juɨ³² ñí¹ hnió³ tsú² hi³ tsó³² cun³quionh³ zɨ́h¹ mu² hi³ lɨ́³ jáun² cun³quionh³ cáun² jo²¹ hmá² míh¹ hi³ he² jáun² tɨ³ cu³hna²¹ hi³ hu²¹ jáun² chu³ jmáɨ². La³ jáun² bíh¹ lɨ́³ siáh³ zɨ́h¹ dí² uá²jaɨ³², uá¹jinh¹ cáun² hi³ pih²¹ lɨ́n²¹ bíh¹ jaun³², tɨ³la³ cun³ jáun² hliáun³ lɨ́n³² bíh¹ hi³ jmu². Uá¹la³ cun³ cáun² sɨ́² pih²¹, cun³quionh³ hi³ pih²¹ jáun² bíh¹ lɨ́³ có³² cáun² já¹hngá¹ pa²¹ lɨ́n²¹. Hi³ ja³bí¹ zɨ́h¹ dí² siáh³ lɨ́³ la³jmɨ́ lɨ́³ cáun² sɨ́². Zɨ́h¹ dí² jáun² bíh¹ jlánh¹ hlah³ la³ cónh³ bíh¹ la³jɨ́³² ñí¹ pih²¹ ñí¹ siún¹ quiú¹³ dí², hi³ jáun² tá¹ jan² bíh¹ dí² má²tsá²hliánh² lɨ́²³. Sɨ́² hi³ chí¹hún¹ jáun² zɨ́h¹ dí² ja³² la³ tɨ³ quiu³juóu³² bíh¹, hi³ jlánh¹ cue³² uu³mí²tsɨ³² la³ cun³ jmáɨ¹ hi³ ziáun² dí². La³jɨ́n³² ñí¹ jáh³ bíh¹ tɨn² tsá²mɨ³cuóun² ma³táɨn³², hi³ hí¹ la³ tɨ³ má²ca³ma³táɨn³² yáh³ tsú²; uá¹la³ jáh³ cánh¹, jáh³ ngɨ³² rón³² hué³², tan³² nɨ́², jɨ³ jáh³ jmáɨ² nɨ́² siáh³. Tɨ³la³ uá¹jinh¹ tɨn² tsáu² ma³táɨn³² jáh³, tɨ³la³ hí¹ jan² bíh¹ tiá² hin² tɨn² ma³táɨn³² zɨ́h¹ hnga². Zɨ́h¹ dí² jáun² dá² cáun² ti³ tɨn² jmu² hlaɨh³ bíh¹, la³ cun³ hi³ dí¹quian¹ hnga², hi³ jlánh¹ quian³² no¹ huáh² tsɨ́³ hi³ lɨ́³ jngah³. Quí¹

sa³ cun³quionh³ zɨh¹ jáun² bíh¹ dí² ma³quien¹³ dí² Dió³² Jméi² dí², hi³ cun³quionh³ zɨh¹ jáun² bíh¹ dí² siáh³ chú¹ juon¹ dí² tsá²mɨ³cuóun² raɨnh²¹ dí², tsá² lɨ²ma³zian² hí³ Dió³² la³ cun³ rón³² lɨ³ jáun² nóh³² quioh²¹ dí² hnga². Sa³ cáun² ho³ jáun² bíh¹ dí² hue³² jú¹ chu²¹ la³ má²quionh³ jú¹ hlah³. Hnoh² reh², tiá² jmɨ́ ca³tɨ²¹ cu³tí¹³ yáh³ hi³ lɨ́³ la³ jáun². ¿Hí¹ lɨ́³ bíh¹ hion¹³ jmɨ² cuóuh³ cu³tsa³² quionh³ jmɨ² ñeh¹ nɨ́juáh³ cáun² ñí¹ hion² jmáɨ² dúh¹? Hi³ sa³jun³ háɨ³² yáh³ huɨ́h² pih²¹ hmá² sí² co², sa³jun³ lɨ́³ ha³ siáh³ mɨ³ hmá² sí² co² hmáɨh³² uóun²jɨeh¹³. Reh², la³ jáun² bíh¹ lɨ́³ siáh³ hi³ hí¹ cónh³ yáh³ tiá² lɨ́³ hion¹³ jmɨ² cuóuh³ ñí¹ qui³ má²hion² jmɨ² ñeh¹. Hi³ jáun² né³, nɨ́juáh³ ja¹ quián¹³ hnoh² zian² jan² tsá² quia³lín³ jmɨ́ tsɨ́³, tsá² cháunh²³ re² chí¹, cuɨ́ jmu¹ tsú² lin¹ cun³quionh³ hi³ zian² tsú² hi³ chun¹, jɨ³ cun³quionh³ hi³ chu²¹ hi³ jmu² tsú². Tɨ³la³ la³ cun³ qui³ jmu² jan² tsá² quia³lín³ jmɨ́ tsɨ́³ má¹na²¹, hniáuh³² jmu³ tsú² hi³ tiá² quien² hnga² tá¹la³ jmu² tsú² jáun² hi³ chu²¹. Tɨ³la³ nɨ́juáh³ cuéh¹ hnoh² jáɨ¹³ hi³ lɨ́³ lɨ́m³ náh² tsá² ja³²lɨ³ uóu³² tsɨ́³, hi³ cáun² lɨ́ zian² náh² ca³tɨn¹ hmóu³², jáun² tiá² ca³tɨn¹ náh² jmúh¹³ tonh² hi³ jlánh¹ re² cháunh²³ honh² náh²; quí¹ má²ná¹jlɨ́h²³ bí¹ náh² jú¹ tson² cun³quionh³ jú¹ tɨ́jáɨ² nɨ́juáh³ la³ jáun². Quí¹ jun³juáh¹³ Dió³² yáh³ jmu² hi³ cháunh²³ chí¹ tsú² la³ nɨ́², hmóu³² bíh¹ tsá² zian² ñí¹ hué²¹ lá² hnauh² chí¹ la³ nɨ́². Cáun² hi³ tɨn² hmóu³² tsá²mɨ³cuóun² bíh¹ nɨ³², hi³ cháunh²³ nɨ́² chí¹ tsú² ja³² ñí¹con² tsá² hláɨnh¹ bíh¹. Quí¹ ñí¹ zian² tsá² uóu³² tsɨ́³, tsá² lɨ́ zian² jmáh³la³ hi³ ca³tɨn¹ hmóu³², jáun² ñí¹ la³ jáun² cáun² tiáunh¹ tsú² cú²tiú² cú²jan³² bíh¹, hi³ zia³² siáh³ la³jáh³ dú¹ ñí¹ hi³ hlah³. Tɨ³la³ la³ cun³ hi³ cháunh²³ jáun² tsɨ́³ tsú² hi³ ja³² ñí¹con² Dió³² má¹ná¹, lɨ́³ cáun² hi³ jɨ² bíh¹ la³ñí¹ la³ján³. Tsá² quia³lín³ jmɨ́ tsɨ́³ la³ hí³ bíh¹ lɨ́m³ jan² tsá² jmu² hi³ lɨ́³ niau²¹ tie³, jan² tsá² jmu² juenh² tsɨ́³, tsá² huá¹ chí¹, tsá² ja³² mií³ tsɨ́³, tsá² jmu² cá² ñí¹ hi³ chu²¹, tsá² jɨen³² tsáu² cú²re² he², tsá² tiá² zaɨ³² jë¹. Jáun² né³, tsá² má²re² hniéi² quioh²¹ tsáu², hi³ hnió³ hi³ zian² tsáu² cáun² hi³ re² hi³ tɨn², tsá² la³ hí³ bíh¹ jmu² hi³ tá²tsɨ²¹ héih³² cú²tso². ¿He³ láɨh³² zia³² hniéi² ja¹ quián¹³ hnoh², hi³ tiá² re² tiáunh¹ náh² cá²honh¹? ¿Haun¹³ juáh¹³ cun³ñí¹ hi³hliá² dí¹quiaunh²¹ honh² náh² hi³ hlah³ bíh¹, hi³ jáun² hú¹pɨ́² hú¹juoun³² honh² náh², quí¹ cun³ñí¹ hi³ zia³² hi³ hniá¹ náh²? Quí¹ zia³² bíh¹ hi³ hniá¹ hnoh² quioh²¹ tsáu², tɨ³la³ nɨ́juáh³ tiá² la³ ca³lɨ³

zia³² yáh³ hi³ jáun² quián¹³ hnoh² né³, jáun² cáun² jngɨh²³ bíh¹ náh² tsú². Hi³ nɾ̱juáh³ tiá² ca³janh¹ hnoh² hi³ jmɾ̱ hen² jáun² honh² náh² né³, jáun² cáun² lɾ̱ ja³² uóu³² honh² bíh¹ náh², hi³ jmuh³² náh² hniéi², hi³ quiú² tɨn²³ náh² quiúnh¹ tsáu². Cun³ñí¹ hi³ tiá² mɨh³² ñí¹con² Dió³² bíh¹ náh², hi³ jáun² bíh¹ tiá² chanh¹ hnoh² la³ cun³ hi³ jmɾ̱ hniá¹ náh² jáun². Hi³ uá¹jinh¹ mɨh³² náh², cun³ jáun² tiá² hián¹³ bíh¹ náh², quí¹ cun³ñí¹ hi³ hu²¹ siánh³ honh² náh² tá¹la³ mɨh³² náh² jáun², hi³ lɾ̱ hnáuh² náh² má¹hiúnh¹³ honh² hmóu³² cun³quionh³ hi³ jmɾ̱ hniá¹ náh² jáun² hian³. ¡Hnoh², tsá² lɱ³ náh² la³jmɾ̱ lɱ³ tsá²mɨ³ juón¹! ¿Tiá¹ má²ñíh¹ hnoh² hi³ tsá² jéih³² hi³ zia³² ñí¹ hué²¹ lá², tsá² la³ hí³ má²lɱ³ jan² tsá² hon² Dió³² bíh¹? Quí¹ lɨ³ua³ jan² tsá² tɨ³² tsɾ̱³ hi³ zia³² ñí¹ hué²¹ lá², tsá² la³ hí³ má²ná¹háun³ bíh¹ quionh³ Dió³². Quí¹ jun³juáh¹³ cáun² ti³ lɾ̱ rá¹juáh³ yáh³ jáɨ¹³ quioh²¹ Dió³² ñí¹ rá¹juáh³ jáun² la³ lá²: “Jmɾ̱²chí³ Chun¹ ca³tanh² hí³ Dió³² hñu³ tsɾ̱³ dí² jlánh¹ hniau³ dí² ca³la³ hi³ hɨ³² lɱ³² tsɾ̱³”. Hi³ jáun² né³, tɨ³ lɨ³mí¹ má²ca³ma³hé² ma³mieh² bíh¹ dí² Dió³², la³ cun³ rá¹juáh³ jáun² jáɨ¹³ quioh²¹ Dió³², hi³ juáh³ la³ lá²: “Dió³² tiá² cué³² jáɨ¹³ hi³ lɾ̱³ lɨ³ quien² tsá² jmu² quien² hnga², tɨ³la³ má²hé² má²mieh² tsú² tsá² tsɾ̱juɾ̱³ bíh¹”. Jáun² né³, jɨenh²¹ náh² hmóu³² ñí¹con² Dió³²; hi³ jmu³ náh² huáh² chinh³² ñí¹con² tsá² hláɨnh¹, hi³ jáun² cuon³ tsú² ñí¹con² náh². Jmu³ náh² pí³ hi³ lɨ³ cuóun³² náh² Dió³², hi³ jáun² Dió³² lɨ³ cuóu³² siáh³ hnoh². Hnoh² tsá² ná¹ren² náh² tso³, ma³jɾ̱³ náh² cuonh², hi³ jáun² lɾ̱³ ná¹chan¹ ñí¹con² Dió³². Hi³ hnoh² né³, tsá² nio² tun³ honh², ma³jɾ̱³ náh² honh², hi³ jáun² niau²¹ cáun² honh² náh². Chá¹ náh² hlaɨh³ honh², hi³ uo³ náh² ca³la³ hi³ jngɨh³² honh² náh². Cha³ jmɾ̱ jú¹ jmɾ̱ ngáɨh¹³ náh², cuɾ̱ taɨn²¹ jmɾ̱²zɾ̱h¹ máh¹ náh²; hi³ cha³ jmɾ̱ má¹hiúnh¹³ náh² honh² né³, cuɾ̱ niau²¹ hlah³ honh² náh². Jmu³ náh² hi³ tsɾ̱juɾ̱³ náh² ta³ ñí¹ Dió³² Juo¹³ dí², jáun² hí³ né³ ziau³ chi³cuú² hi³ lɨ³ quien² náh². Hnoh² reh², tiú²uú² hniáuh³² ziú¹ hɨen¹³ náh² tsá²ján² tsá²ján²; quí¹ tsá² hleh³² hlah³ quioh²¹ raɨnh²¹, ho³ hi³ chú² ñih²³ siáh³ raɨnh²¹, tsá² la³ hí³ dá² hleh³² hlah³ ca³tɨ²¹ liei²¹ jáun² quioh²¹ Dió³² bíh¹, hi³ chú² ñih²³ tsú² siáh³ liei²¹ jáun². Quí¹ nɾ̱juáh³ la³ chú¹ la³ ñih²¹ hnú² liei²¹ jáun², jáun² jmuh³² hnú² la³jmɾ̱ jmu² jan² tsá² lɱ³ jue²¹ bíh¹ cha³ jmɾ̱ má¹tih²¹ hnú² la³ cun³ hi³ juáh³ jáun² liei²¹. Quí¹ jan² tán¹ bíh¹ Tsá² ca³quiú² héih³² zian², hi³ lɱ³

siáh³ Jue²¹; hnga² hí³ bíh¹ siáh³ tɨn² lión³² tsáu², ho³lá²dá² hi³ hin³ tsú² tsáu². Hi³ jáun² né³ ¿hin² dá² tsánh² hnú², jáun² sa³ hnú² yáh³ hnáuh² jmúh¹³ jue²¹ hi³ rá¹tsɨh³² héih³² ñí¹con² tsá²mɨ³cuóun² renh²? Hi³ jáun² né³, hnoh² tsá² juáh³ la³ lá²: “Né³² ho³ tsa³háu² tsáu¹³ jnoh¹ cú²juú² cun³ cáun² mii², hi³ tsá¹hnáu¹³ jnoh¹ quɨe³”, niéi² náh² re² jáɨ¹³ lá²: ¡Hí¹juáh³ he³ lɨ́³ tsa³háu² yáh³ tiá² hi³ ñíh¹ hnoh², tiá¹³ bíh¹ tiá³ jlánh¹ ñíh¹ hnoh² hi³ he³ lɨ́³ jmɨ́tsú² jmɨ́ja³²! Quí¹ jmáɨ¹ hi³ zian² hnoh² jáun² dá² lɨ́³ la³jmɨ́ lɨ́³ cáun² jnie³ cháun¹ bíh¹, cáun² hi³ lɨ́ jnia² cu³tiá³ pih²¹, hi³ la³juɨ³² yein³² siáh³. La³ lá² bíh¹ jmɨ́ hniáuh²¹ juáh¹³ hnoh²: “Nɨ́juáh³ Dió³² Juo¹³ dí² hnió³, jáun² ziáun² bíh¹ dí² hi³ jmú¹³ dí² hi³ lá² ho³ hi³ ó³²”. Tɨ³la³ hnoh² má¹ná¹, cá² ñí¹ hléh¹ jú¹ tú² ráun³ bíh¹ hnoh² hi³ jmuh³² náh² tonh² lɨ́n³²; tɨ³la³ jáɨ¹³ la³ nɨ́² né³, hú¹tá¹ jú¹ hlah³ bíh¹. Hi³ jáun² nɨ́juáh³ zian² tsá² má²ñi³² he³ hi³ chu²¹ jmu³, tɨ³la³ má¹lɨ³² jáun² né³, tiá² hi³ jáun² jmu² yáh³ tsú², hi³ jáun² tsá² la³ hí³ má²ca³lɨ³ren² tso³ bíh¹. Ja³bí¹ hnoh² siáh³, tsá² hánh³, ¡niéi² náh² re² jáɨ¹³ lá²! Uo³ hnoh² hi³ tɨ́ hoh³ náh² hi³ ca³tɨ²¹ uu³cha³tsɨ³² hi³ né³bí¹ má¹tsoh¹ náh² honh². Lɨ́³ la³juah²¹ dúh¹ hi³ má²ca³cáh² bíh¹ la³jɨ́³² hi³ zia³² jáun² quián¹³ náh²; hi³ hmɨh³² chu²¹ hi³ nio³ náh² jáun² né³, lɨ́³ la³juah²¹ dúh¹ hi³ má²ca³cúh² mí¹cháu² bíh¹. La³jmɨ́ lɨ́³ hi³ má²ca³hiá² juóuh³² bíh¹ mí¹ñí² cú¹tiáu² jɨ³ mí¹ñí² cú¹mí¹niau²¹ jáun² quián¹³ hnoh². Juóuh³² jáun² né³ má²li²¹ hi³ tson² bíh¹ má²ca³lɨ³ren² náh² tso³, hi³ jáun² cun³quionh³ juóuh³² jáun² bíh¹ cón³² hnoh² la³juah²¹ dúh¹ hi³ hún¹ sɨ́². Quí¹ jmáɨ¹ hi³ tiauh² dí² lá² jlánh¹ má²ca³cháh¹ hnoh² cu³lɨ²¹ hi³ lɨ́³ lɨ³ hánh³ náh². Sá¹nɨ́² niéi² náh², jɨe³ cónh³ tso³ tiá² cha³² quɨe³ hi³ jmɨ́ hniáuh²¹ má¹hmah²¹ náh² ñí¹con² tsá² ca³jmú³ ta²¹ ñí¹náɨ² quián¹³ náh²; hi³ Dió³² Tsá² lɨ́n³ Juo¹³ hliáu³ tionh² hñu³mɨ³cuú² né³, má²ca³náɨ³² jáɨ¹³ hi³ tú² hna² jáun² tsá² ca³jmú³ hí³ ta²¹ ñí¹con² náh². Jlánh¹ re² ma²ca³ma³zián¹³ hnoh² ñí¹ hué²¹ lá², hi³ cáun² lɨ́ má²ca³ma³hiúnh¹³ hnoh² honh² hi³ jmúh¹³ náh² lɨ³ua³ cáun² hi³ ca³lɨ³ hniá¹ náh² jmúh¹³. ¡La³jmɨ́ má²cánh¹ tsú² cuá¹juɨ́² hi³ má²jngɨh³ bíh¹ tsú², má²ca³ma³hion²¹ náh² honh²! Hi³ cáun² lɨ́ ca³ra³can³² náh² tso³ tsá² tiá² tso³ ren², hi³ ca³jngɨh³² náh²; uá¹jinh¹ tsá² tiá² hi³ hlah³ ca³jmú³ hí¹ cáun² ñí¹con² hnoh². Hi³ jáun² né³ reh², tsá² ná¹janh³² náh² hi³ jáunh³ Tɨ³² Juo¹³ dí², hniáuh³² ná¹hu²¹ honh² náh² ca³tɨ²¹

jmáɨ^{1} jáun^{2} la^{3}jmí$^{˩}$ ná^{1}hu^{21} tsí^{3} tsá^{2} zia^{32} hi^{3} má^{2}jná^{1} ñí^{1}náɨ^{2} quioh^{21}, tsá^{2} ná^{1}hé^{2} ná^{1}jan^{32} hi^{3} chau^{13} jmí^{3} la^{3} cun^{3} jmáɨ^{1} hi^{3} lɨ^{3} hniáuh^{32}, quí^{1} hu^{21} tsí^{3} tsú^{2} hi^{3} ló^{32} re^{2} hi^{3} quioh^{21}. Jáun^{2} né^{3}, ja^{3}bí^{1} hnoh^{2} siáh^{3} hniáuh^{32} cháh^{13} náh^{2} tiá^{3} honh^{2} ca^{3}tɨ^{21} hi^{3} hu^{21} jáun^{2} honh^{2} náh^{2} hi^{3} má^{2}ja^{3}quián^{3} jáunh^{3} Tɨ^{32} Juo^{13} dí^{2}. Hnoh^{2} reh^{2}, ha^{3} lí^{2} chú^{1} lí^{2} ñih^{21} náh^{2} tsá^{2}ján^{2} tsá^{2}ján^{2}, jáun^{2} tiá^{2} tá^{1}tsɨn^{1} náh^{2} héih^{32}, quí^{1} má^{2}ja^{3}quián^{3} cu^{3}tí^{13} bíh^{1} jáunh^{3} Dió^{32} Tsá^{2} lí̶n^{3} Jue^{21}. Hi^{3} jáun^{2} né^{3} reh^{2}, chú^{32} jmu^{3} náh^{2} la^{3}jmí$^{˩}$ ca^{3}jmú^{3} jáun^{2} la^{3}jí̶n^{32} tsá^{2} ca^{3}lɨn^{3} hí^{3} *tɨ^{32} jë^{1} Dió^{32}, tsá^{2} ca^{3}hléh^{3} hí^{3} cha^{13} Tɨ^{32} Juo^{13} dí^{2}; uá^{1}jinh^{1} ca^{3}ma^{3}tso^{2} lí̶n^{32} tsú^{2} tsí^{3}, tɨ^{3}la^{3} ca^{3}tiánh^{3} bíh^{1} tsú^{2} hi^{3} ná^{1}hu^{21} cáun^{2} tsí^{3}. Sá^{1}ní^{2} jɨe^{3}, jnoh^{1} ná^{1}láɨ^{23} hi^{3} jlánh^{1} jmí$^{˩}$ ren^{2} tsá^{2} ca^{3}ma^{3}tso^{2} hí^{3} tsí^{3}. Uá^{1}la^{3} cun^{3} hi^{3} má^{2}ca^{3}niéih^{2} náh^{2} jáun^{2} hi^{3} ca^{3}tɨn^{1} hla^{1} Job; tsá^{2} hí^{3} jlánh^{1} re^{2} ca^{3}cueh^{3} tsí^{3} ñí^{1} ca^{3}la^{3} jí^{32} hi^{3} ca^{3}quiúnh^{32}, hi^{3} ná^{1}ñíh^{1} náh^{2} siáh^{3} he^{3} ca^{3}hiauh^{3} tsú^{2} ñí^{1}con^{2} Dió^{32} jmí$^{˩}$ lɨ^{21} jáun^{2}, quí^{1} Dió^{32} jlánh^{1} chun^{1} hi^{3} ja^{32} lí̶n^{32} mií^{3} tsí^{3}. Jáun^{2} né^{3} reh^{2}, zia^{32} bíh^{1} siáh^{3} cáun^{2} jú^{1} tson^{2} hi^{3} jlánh^{1} bíh^{1} quien^{2} hi^{3} juáh^{3} la^{3} lá^{2}: Tiá^{2} hniáuh^{32} má^{1}quien^{13} náh^{2} jáɨ^{13} quián^{13} cun^{3}quionh^{3} hi^{3} hɨen^{13} náh^{2} Dió^{32}, sa^{3}jun^{3} hi^{3} hɨen^{13} náh^{2} tsá^{2} zian^{2} ñí^{1} hué^{21} lá^{2} siáh^{3}, sa^{3}jun^{3} hí^{1} cáun^{2} hi^{3} siáh^{3} siáh^{3} tiá^{2} hniáuh^{32} hí̶eh^{1} náh^{2} hi^{3} má^{1}quien^{13} náh^{2} jáɨ^{13} quián^{13}. Quí^{1} jáɨ^{13} la^{3} ní^{2} tiá^{2} lin^{1} lɨ^{3} hniáuh^{32} yáh^{3} ní$^{˩}$juáh^{3} hi^{3} ná^{1}lí̶n^{3} hnoh^{2} tsá^{2} tson^{2} jëh^{2} náh^{2}, uá^{1} hi^{3} ca^{3}juah^{21} náh^{2}: “Tson^{2}”, uá^{1} hi^{3} ca^{3}juah^{21} náh^{2}: “Tiá^{2} tson^{2}”; quí^{1} ní^{2} lí$^{˩}$ ca^{3}ta^{3}zanh^{1} náh^{2} ñí^{1} hlah^{3}. Hi^{3} jáun^{2} né^{3}, ní$^{˩}$juáh^{3} ja^{1} quián^{13} hnoh^{2} zian^{2} jan^{2} tsá^{2} má^{2}tso^{2} tsí^{3}, cuí$^{˩}$ liéinh^{21} tsú^{2} Dió^{32}. Hi^{3} ní$^{˩}$juáh^{3} zian^{2} tsá^{2} re^{2} nio^{2} tsí^{3}, jáun^{2} cuí$^{˩}$ má^{1}quien^{2} tsú^{2} Dió^{32} cun^{3}quionh^{3} hi^{3} hɨe^{32} tsú^{2} jáun^{2} sun^{1}. Hi^{3} ní$^{˩}$juáh^{3} zian^{2} jan^{2} tsá^{2} tsáun^{1}, cuí$^{˩}$ tiéh^{13} tsú^{2} tsá^{2}daun^{32} tsá^{2} ná^{1}ñí^{1} cuáh^{32}, jáun^{2} tsá^{2} hí^{3} tsa^{3}táunh^{1} hi^{3} tsa^{3}lienh^{3} Dió^{32} cha^{13} Tɨ^{32} Juo^{13} dí^{2} hi^{3} ca^{3}tɨn^{1} tsú^{2}, hi^{3} jñéi^{3} tsú^{2} siáh^{3} no^{1} chí^{1} tsú^{2}. Jáun^{2} ní$^{˩}$ má^{1}ca^{3}liéinh^{32} tsú^{2} jáun^{2} Dió^{32} hi^{3} ná^{1}tioh^{3} cáun^{2} tsí^{3} tsú^{2}, lan^{13} bíh^{1} tsá^{2} tsáun^{1}. Dió^{32} bíh^{1} jmah^{3} tsá^{2} hí^{3}; hi^{3} ní$^{˩}$juáh^{3} ren^{2} tsú^{2} tso^{3}, ja^{3}bí^{1} hin^{3} siáh^{3} tsáu^{13} tsú^{2} uá^{2}jaɨ^{32}. Jáun^{2} né^{3}, cun^{3}ñí^{1} hi^{3} jáun^{2} bíh^{1} chú^{32} ton^{13} náh^{2} tsáuh^{3} ñí^{1}con^{2} tsá^{2}ján^{2} tsá^{2}ján^{2}, hi^{3} lienh^{1} náh^{2} siáh^{3} Dió^{32} ca^{3}tɨn^{1} tsá^{2}ján^{2} tsá^{2}ján^{2}, jáun^{2} lan^{13} náh^{2}. Ní$^{˩}$juáh^{3} jan^{2} tsá^{2} zian^{2} la^{3} cun^{3} hi^{3} tɨ^{32} tsí^{3} Dió^{32} liéinh^{32} Dió^{32} [ca^{3}la^{3} jonh^{3} jmí$^{˩}$ tsí^{3}], hú^{1}tá^{1} cu^{3}tí^{3} jmu^{3} bíh^{1} ta^{21}. Uá^{1}la^{3} cun^{3} hi^{3} ca^{3}lɨ^{3} jáun^{2} ñí^{1}con^{2} Líh^{3}, tsá^{2} jmí$^{˩}$

lɨn³ hí³ tɨ³² jë¹ Dió³² jmɨ́ tin². Ja³bí¹ tsá² hí³ siáh³ jmɨ́ lɨn³ jan² tsá² lɨ́ tsáu² la³ jnoh¹ bíh¹; tɨ³la³ jmɨ́ ca³liéinh³² tsú² jáun² Dió³² né³, hi³ ca³mɨ́³ tsú² hi³ tiú²uú² chau¹³ jmɨ́³, jáun² ca³quin³ bíh¹ jmɨ́³ cun³ hnɨ³² mii² tón³² hué³² ñí¹ jmɨ́ cuá³ tsú² jáun². Jmɨ́ lɨ²¹ jáun² né³, ca³liéinh³² tsú² siáh³ Dió³², jáun² ca³jauh³ bíh¹ siáh³ jmɨ́³ hué³² jáun², jáun² ca³cuú² ca³láu² bíh¹ re² la³jɨ́³² hi³ lau³ cuá¹ hué²¹. Hnoh² reh², nɨ́juáh³ ja¹ quián¹³ hnoh² zian² jan² tsá² cón³² siáh³ jan² tsá² jmɨ́ má²ngau³² tɨ³ có³² ca³tɨ²¹ jú¹ tson², jáun² cháu¹ náh² honh² hi³ tsá² jmu² ta²¹ la³ jáun² má²ca³lión³² jan² tsá² jmɨ́ má²jún¹ bíh¹, hi³ jmu² tsú² siáh³ hi³ lɨ́³ hin³ ca³la³ jɨ́³² tso³ hi³ jmɨ́ ren² jáun² tsá² hí³. [Cun³ nɨ́² bíh¹ tí³ jáɨ¹³ hi³ juanh³² jná¹³ ñí¹con² hnoh² reh².]

APPENDEX I: GLOSSARY OF TECHNICAL CONCEPTS AND TERMS

Some technical terms and abbreviations used in this paper

Orthography a writing system for a given language.

Writing system an implementation of one or more scripts to form a complete system for writing a particular language. http://scripts.sil.org/cms/scripts/page.php?cat_id=Glossary#writingsys

Human-Computer Interation (HCI)