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A Study of the Spatial Domain in Folktale Collections of Three Formosan Languages

Jonathan Strandh

Centre for Languages and Literature (SOL)

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Supervisors: Niclas Burenhult and Arthur Holmer

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Abstract

The study of the spatial domain within the field of semantic typology has seen more and more research activity since its inception. Still, more research is needed in order to uncover more of the linguistic variation of spatial language. As such, the present study examined, compared, and typologically classified three spatial subfields – basic locative constructions (BLC), frames of reference (FoR), and motion events – between three Austronesian, Formosan languages – Puyuma, Saaroa, and Paiwan – of which the spatial domain has not been comprehensively studied as of yet. The study analyzed examples collected from corpora of transcribed, glossed, and translated folktales by way of a list of search terms. The results show that the Formosan languages employ morphosyntactically different, but semantically similar, BLCs, make use of an intrinsic FoR and absolute FoR that grammaticalizes salient landmarks, and serial verb constructions with complex path verbs alongside manner verbs, which defies the Talmyian dichotomy between verb-framed and satellite-framed languages. Finally, the present study discusses the usefulness of the corpora for, and proposes future avenues of, further research into Formosan spatial language based on the results.

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Abbreviations and Conventions¹

1	1st Person
2	2nd Person
3	3rd Person
AF	Actor focus
AUX	Auxiliary
AV	Actor voice
BOUND	Bound
C	Construct marker
CAUS	Causative
CL	Classifier
CORE	Core
COS	Change of state
DEF	Definite
DIR	Directional
EMPH	Emphatic
EXCL	Exclusive
F	Focus
FILL	Filler
FUT	Future
GEN	Genitive
H	Honorific

¹ Different translators, even of the same language, have used different glossing conventions. The present study aims to maintain the original glossing of the translators. However, where there is risk of confusion, such as when two translators gloss the same morpheme slightly differently, the different glossings have been standardized according to the conventions of one of the translators.

IMM	Immediate
INCL	Inclusive
INDF	Indefinite
IRR	Irrealis
LF	Locative focus
LNK	Linker
LOC	Locative
MVT	Movement
NMZ	Nominalization
NOM	Nominative
NUM	Numeral
OBL	Oblique
PART	Particle
PERF	Perfective
PF	Patient focus
PFV	Perfective
PL	Plural
PRS	Present
PREP	Preposition
PTCP	Participle
PSR	Possessor
PST	Past
QAL	Quality
RED	Reduplication
ROOT	Root
SG	Singular

STAT	Stative
TOP	Topic

1. Introduction

The field of semantic typology investigates various linguistic features and categories in relation to specific semantic fields across different languages (Levinson & Wilkins 2006). Such a field under investigation is the spatial domain. The spatial domain intersects spatial cognition and linguistic expression in the sense of how language is used to conceptualize, structure, and represent space. Fundamentally, a necessary component in the evolution of human cognition is the capacity to navigate our surroundings and environment, to orient ourselves in relation to external objects, and to convey such information to others (Levinson 2003). In short, it is the ability to answer the question of *where?* Furthermore, the language of space extends beyond the physical into other cognitive domains, such as figurative and metaphorical language. As such, research into the spatial domain within the broader scope of semantic typology can be restated as an inquiry into the complex relationship between language, culture, and even thought.

While it might be assumed that spatial thinking constitutes a set of universal experiences and conceptual categories that languages merely express in different ways, typological studies by Levinson (2003) and his colleagues at the Max Planck Institute for Psycholinguistics complicate the picture. The historical view was that the same semantic and cognitive structures used for construing the spatial domain were universally anthropocentric and, as a result, surface in all languages as such, an idea encapsulated in the term “psychic unity of mankind”². However, the great amount of linguistic diversity in the spatial domain from these typological studies reveals underlying differences in spatial cognition that call into question its supposed universality. Instead, a diversity of thought must be considered in light of the diversity of spatial language. In addition, the debate on whether language influences thought, and, if so, to what extent, can be deepened by insights from further research into the relatively nascent field of semantic typology, which has already discovered much. To that end, more research is needed on the spatial domain of undocumented and poorly documented languages, a gap which Levinson identified and which the present study endeavours to help remedy.

² The term “psychic unity of mankind” (Levinson 2003, p. 15) in the context of the spatial domain refers to the supposedly shared, innate anthropocentric bias in human psychology when perceiving the outside world. Levinson’s findings, especially languages where an absolute frame of reference is in use, cast doubt on this presupposition.

The present study situates itself within the larger context of semantic typology by narrowly investigating what a corpus of folktales can reveal about subfields of the spatial domain in three Austronesian, Formosan languages – namely, Puyuma, Saaroa, and Paiwan – since the spatial domain of these languages has not received in-depth descriptive attention as of yet. Specifically, it looks into how basic locative constructions (BLC) are realized, what frames of reference (FoR) are in use, and how motion events are represented in each language. As its primary sources, the study makes use of collections of transcribed, translated, and glossed folktales from local communities of speakers of each respective language. In particular, it examines the possibility and usefulness of such materials in studying spatial language and what they might show about Formosan spatial language. Thus, it can be considered a kind of typological corpus study. Moreover, all three of these distantly related languages within the Austronesian language family are located in different parts of the island of Taiwan. This provides a unique opportunity for a comparative study on spatial language between languages with comparable features in terms of geography, culture, and genealogy.

In addition, within the context of the study of spatial language in Austronesian, the Formosan languages, although located on Taiwan, the homeland of Austronesian languages (Blust 2019), are relatively understudied. It is therefore an important area of study in order to discover whether the spatial patterns observed in other Austronesian languages can be traced back to Taiwan via further research into the Formosan languages. Furthermore, research into these languages may potentially reveal greater linguistic diversity, thus helping to fill in the incomplete picture of the cross-linguistic diversity of human spatial language. As such, by shedding light on Puyuma, Saaroa, and Paiwan, the present study aims to investigate the applicability of written narratives in describing select subfields of their spatial domains and discuss potential implications they may have on both the study of spatial language in Formosan and Austronesian and in the wider field of semantic typology.

The present study is arranged under six main subheadings. After the introduction above (1.), the theoretical background of the spatial domain will be presented broadly and of the Formosan languages in particular (2.). A description of the methods as well as the materials on which they were applied follows (3.). Then, the results of the present study will be presented according to the spatial domains under investigation (4.). These results will be discussed, compared, and problematized (5.). Finally, a summary of the main points will conclude the

present study (6.). Following this introduction, the research questions of the present study will be enumerated below (see 1.1).

1.1 Research questions

In order to fill in the incomplete picture of the cross-linguistic variation in spatial language, more research is needed into undocumented and poorly documented languages. Further research will also put the theoretical frameworks on spatial language to the test (see 2.). Compared to some other Austronesian languages, spatial categories in the Formosan languages are relatively understudied. Therefore, they constitute a worthwhile knowledge gap to research. As such, the present study aims to study them by examining three collections of folktales in terms of what they might indicate about their spatial language. In particular, it will target three spatial subfields (see a–c) corresponding to the major subdivisions in the study of space, thus providing a cursory overview of the spatial domain of each language (see 2.).

- (a) Basic locative constructions
- (b) Frames of reference
- (c) Motion events

The present study centers on six research questions (RQ) (see 1–6). The results generated by answering these questions will be limited to what the folktales show. While the results may imply certain patterns in the spatial domain, they cannot be generalized nor be deemed conclusive for each language under investigation (see 3.). Rather, the purpose of these questions is to provide a starting point for future research (see 5.4).

- (1) What can folktales from Puyuma, Saaroa, and Paiwan offer in terms of our understanding of spatial categorization in these languages? In other words, how useful are folktales as indicators of spatial language?
- (2) What do the collections of folktales indicate in terms of how the above subfields (a–c) of the spatial domain are realized in Puyuma, Saaroa, and Paiwan?
- (3) What do the collections of folktales indicate in terms of what typology the above subfields (a–c) of the spatial domain can be classified as in Puyuma, Saaroa, and Paiwan?

- (4) How does the spatial domain as indicated by folktales compare between Puyuma, Saaroa, and Paiwan in the above subfields (a–c)?
- (5) What conclusions can be drawn from the study of the spatial domain in folktales from Puyuma, Saaroa, and Paiwan with regard to spatial language in the context of the Formosan languages and Austronesian language family?
- (6) What conclusions can be drawn from the study of the spatial domain in folktales from Puyuma, Saaroa, and Paiwan with regard to semantic typology and the cross-linguistic variation in spatial language?

2. Background

The spatial domain is an essential part of human survival and language (Levinson 2003). Spatial language is used for navigating our surroundings, locating objects in our environment, and even conceptualizing much of our psychological experience through the use of spatial metaphors. Therefore, continued research into the spatial domain of poorly documented languages may reveal more of the linguistic diversity of spatial language.

Therefore, investigating and documenting the spatial domain of undocumented and poorly documented languages remains an important field of inquiry within semantic typology, linguistics generally, and potentially human cognition. Some of the central questions Levinson (2003) poses in his work *Space in Language and Cognition* relate to the relationship between spatial language and spatial thinking as well as the implications of the considerable amount of linguistic diversity for the proposed universality of spatial language. It is on this foundation that the present study bases itself in order to answer the research questions tied to the Formosan languages (see 1.1).

The theoretical approaches and the languages relevant to the present study will be presented below. First, the spatial domain will be introduced along with basic locative constructions (2.1). Then, frames of reference (2.2) and motion event typology (2.3) will be explained. Finally, the broader genealogical context of the Austronesian language family (2.4), descriptions of the three Formosan languages (2.5), and previous work on spatial language in Formosan (2.6) follow.

2.1 The Spatial Domain and Basic Locative Constructions

Firstly, in order to orient ourselves in the spatial domain, certain subfields have to be defined (see figure 1).³ The primary division is between the subfields of location and motion. Location refers to the static position of an object in space with respect to its spatial relations to other static objects (Levinson 2003). To specify, the terms figure and ground may be used, where figure is the object to be located and ground is the reference object by which the figure can be located.

³ There are different divisions, terminology, and definitions used by different authors. As stated above, the present study operates primarily in the framework by Levinson (2003) and Levinson & Wilkins (2006). For alternative frameworks, see Talmy (2000), Jackendoff (1990), and Zlatev (1997; 2003; 2010).

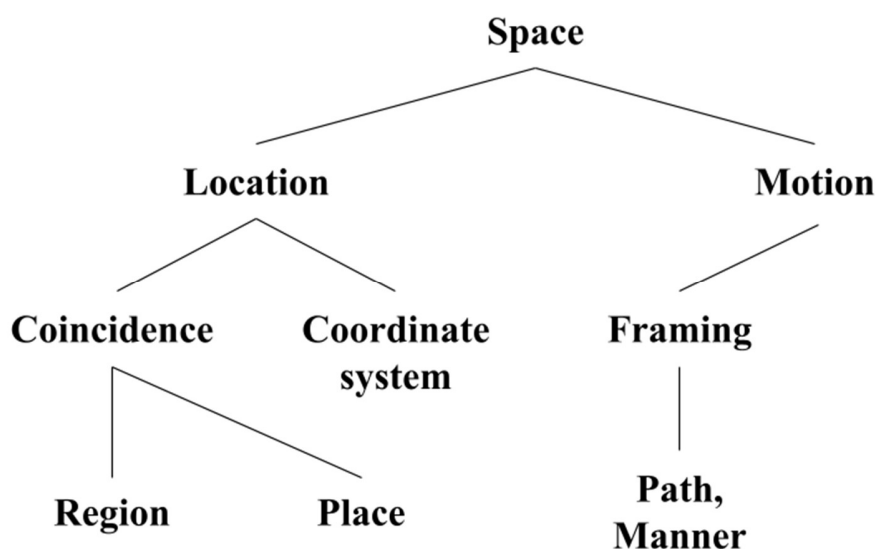


Figure 1. Non-exhaustive division of subfields within the spatial domain relevant to the present study (adapted from *Major semantic subfields in spatial language* [Figure], by Levinson 2003).

Thus, in example (1), “John” is the figure whereas “Stockholm” is the ground. Location itself can be further divided into coincidence, that is, non-angular specifications that denote a partitioned area of ground – the search domain – within which the figure is located, such as region and place, and into coordinate systems, which are angular specifications (see 2.2). Following the conventions in Jiang (2006)⁴, region designates geometric relations where a figure may exist in proximity to, contact with, contiguity with, or containment in, the ground, which may in summary be called topology. Contrast examples (2–5) below. Place, on the other hand, designates toponymy, that is, place names and landmarks, as in example (1) (Levinson 2003).

- (1) [John] is in [Stockholm].
- (2) John is by the house. (Proximity)

⁴ Here, the definition of region breaks from Levinson (2003) and follows Jiang (2006). In short, Levinson puts both topology and toponymy under place, whereas Jiang treats topology separately under region, a detail that allows for more flexibility, in my opinion.

- (3) John is on top of the house. (Contact)
- (4) John is between the house and the tree. (Contiguity)
- (5) John is inside of the house. (Containment)
- (6) John is over there. (Deixis)

Briefly, deixis functions as a non-angular specification that provides a kind of ground (Levinson 2003). However, deixis is a unique phenomenon. It may be used together with, and in place of, the other spatial relations, thus creating a complex, interrelated system that is especially hard to disentangle. Take, for instance, example (6), a sentence that includes the deictic expression “over there” that is equivalent to the spatial relations designated in examples (1–5). Thus “in Stockholm”, “by the house”, “on top of the house”, “between the house and the tree”, and “inside the house” can all be expressed by the deictic expression “over there”. It also commonly interacts with the pronominal system of a language and frames of reference. In addition, deictic expressions rely heavily on context in order to be understood; hence, textual mediums, such as the materials for this study, are less apt for a description of deixis. As such, deixis, an important spatial phenomenon, would suffice as the subject of an entire study on its own and will therefore not be treated in depth in the present study.

For the purposes of the present study, the subfield of location will be examined in the Formosan languages in terms of what frame of reference (FoR) is in use (see 2.2) and what the basic locative construction (BLC) is. BLC refers to the common answer in response to a where-question (Levinson & Wilkins 2006). The BLC of a given language can be described in terms of its morphosyntactic structure. Thus, in example (7), the response is the English BLC, which is realized as a noun phrase (NP) followed by the copula verb BE that is in turn followed by a prepositional phrase (PP). In English, the copula BE also functions as its most common locative verb, a verb used in locative constructions. Different languages have different kinds of BLCs according to their grammar, such as case marking instead of prepositions.

- (7) Where is the cathedral?
It is in the central square.

The BLC can also be described in terms of how prototypical its usage cases are and the canonical or stereotypical spatial relation the figure has to the ground (Levinson & Wilkins 2006). In example (8–9), English makes use of the BLC with two different meanings of the preposition “on”. In (8), the stamp is located on the surface of the envelope in direct contact with it, whereas in (9), the ring is attached to a person’s finger by way of containment. Despite using the BLC in both cases, (9) does not indicate the same kind of spatial relation as in (8) because of the canonical usage of a ring; it would be unusual if the ring is located on top of the finger. Other languages may be more restrictive as to in what cases the BLC is applicable and what kind of relation to the ground is indicated. When such cases arise, other constructions with more specificity take its place, such as the more elaborate description of the location of the cathedral in (10), presumably an answer to a question posed by a visitor unfamiliar with the layout of the city.

(8) The stamp is on the envelope.

(9) The ring is on his finger.

(10) Where is the cathedral?

If you are coming from the train station, take a left at city hall. The cathedral stands in a park, overlooking the central square.

Levinson and Wilkins (2006) have created different scenes and elicited data from speakers of different languages in response to the scenes. Their findings have resulted in the BLC hierarchy (see figure 2). The BLC hierarchy ranks types of scenes according to how likely the BLC is selected compared to other possible constructions. Thus, scenes where figures are impaled by ground objects are the least likely to be described using the BLC in the language, while inanimate and movable figures in contiguity with the ground are the most likely to be coded with the BLC. From the former scene to the latter scene, the likelihood of the selection of the BLC increases progressively.

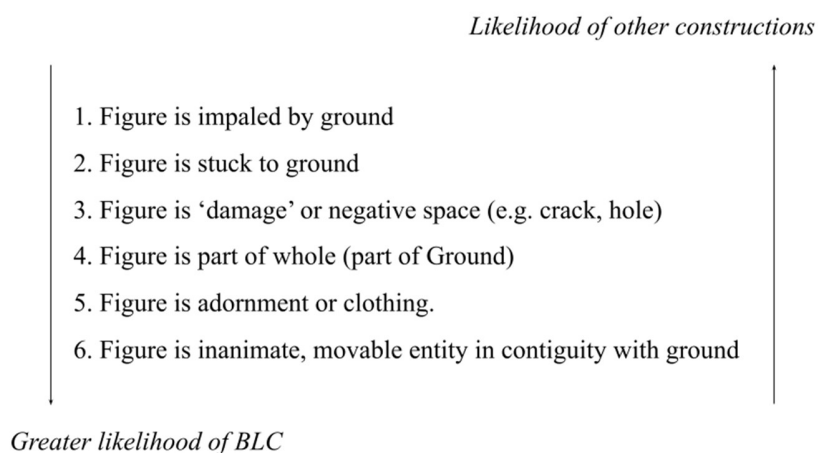


Figure 2. The BLC hierarchy (adapted from *The hierarchy of scenes most likely to get BLC coding* [Figure], by Levinson & Wilkins 2006).

The other major subfield in the spatial domain is motion (see figure 1). Motion denotes spatial change where the location of a figure changes from one point in time to another: a motion event (see figure 3) (Talmy 2000; Levinson & Wilkins 2006). This can be described in the form of an equation where (t = time) and (l = location): at (t₁) the figure is at (l₁) and at (t₂) the figure is at (l₂). The trajectory from the first location to the second location that the figure traverses is called the path. There are other subdomains in the study of motion events; however, the present study will focus on motion verbs and how the Formosan languages frame them according to motion event typology (see 2.3).

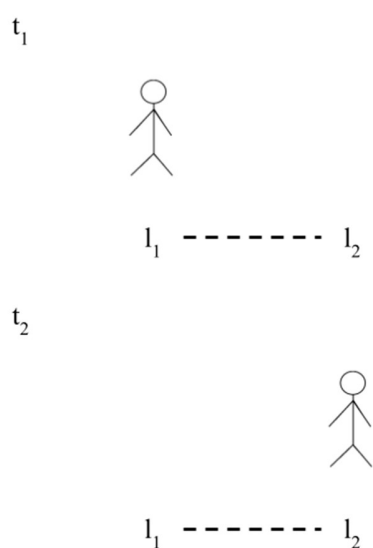


Figure 3. Illustration of a motion event where at (t_1), the figure (depicted as a stick figure) is at (l_1), and at (t_2), the figure is at (l_2). A straight path between the locations is depicted.

An additional point to consider with regard to motion is its classification. Firstly, a distinction must be made between translocational motion in which there is a change of location and self-contained motion in which there is seemingly no change of location between two different points in time (Talmy 2000). Furthermore, the motion causing the figure to undergo a change of location may be either self-propelled or caused, that is, whether the figure is moved by an external force or not. For example, the motion verb “lay” causes the figure to change location which may be contrasted with the figure of the self-propelled motion verb “lie”. For the purposes of the present study, primarily translocational, self-propelled, actual motion events will be considered, although the other kinds will not necessarily be precluded.

2.2 Frame of Reference

In the study of spatial location, coordinate system is the co-hyponym of coincidence. The difference is that, in a coordinate system, the relation between the figure and ground constitutes

an angular specification (Levinson 2003). In other words, when the coordinate system is applied to locate a figure, a search domain is projected from the ground that extends toward the figure at a specific vector. There are three primary types of coordinate systems, called frame of reference (FoR), that a language may employ: the intrinsic, the relative, and/or the absolute frame of reference.

Not only is the difference between the three FoR linguistic, it is also conceptual, argues Levinson (2003). In languages where the absolute FoR is predominant, it is used not only in descriptions of macro-environments, but also in micro-environments (tabletop space). For instance, while it would not occur to an English speaker to say, “The cup is north of the plate”, it would be the natural way in such languages. Another typical example given in support of the claim is the phenomenon observed in speakers of languages that only employ the absolute FoR, namely their ability to constantly keep track of the cardinal directions. A brief description of each FoR follows.

The intrinsic FoR, or object-based coordinate system, makes use of angles solely derived from the figure or ground object (see figure 4) (Levinson 2003). The angles designate their search domains by way of partitioning identifiable sides or facets of the ground object intrinsic to its shape and/or its canonical uses. For example, the house in figure (4), which is the ground object, has an identifiable front and back as well as sides based on the shape of houses in general as well as their uses: the front of a house is also where the entrance is located. These partitions – facets – which are specific to the house, are used as the reference points by which the figure can be located. In short, the intrinsic FoR appropriates the natural shape and use of objects to generate its angular specifications.

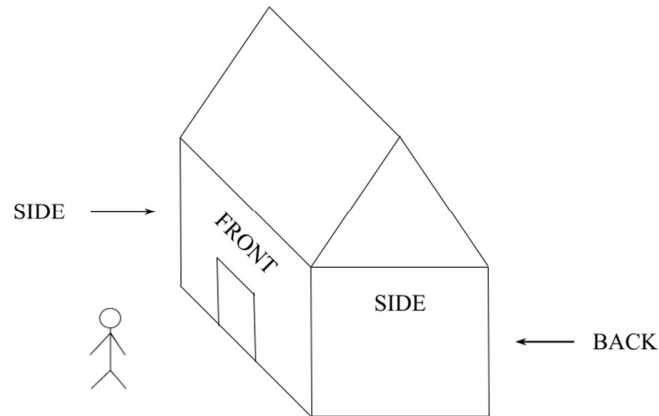


Figure 4. The intrinsic frame of reference. The figure (depicted as a stick figure) is located in front of the house (at the house's front), the ground object.

The relative FoR, or viewer-centered coordinate system, makes use of angles derived from the position of the viewer relative to the ground object (see figure 5) (Levinson 2003). This is accomplished through transformation, whereby the viewer designates search domains by mapping their own directions onto the ground object. For example, the house in figure (5), which is the ground object, is assigned a left and right based on the left and right of the viewer. Then, the location of the figure is triangulated with respect to the viewer and house as reference points. In short, the relative FoR adapts the perspective of the viewer to generate its angular specifications from the ground object.

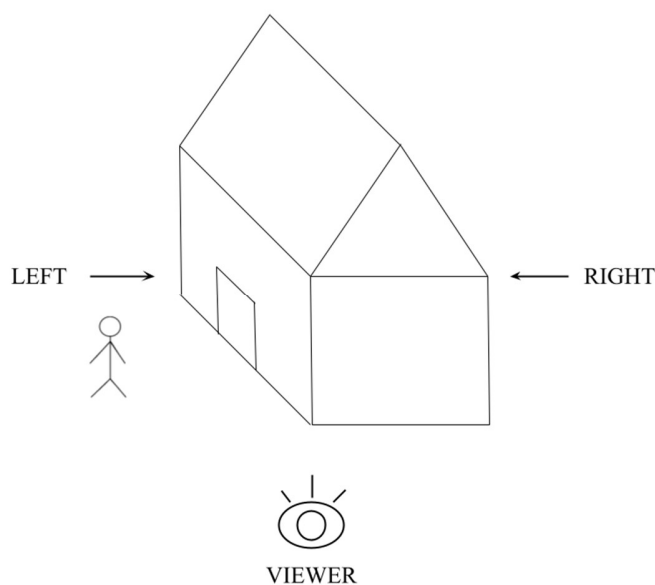


Figure 5. The relative frame of reference. The figure (depicted as a stick figure) is located to the left of the house, the ground object, relative to the viewer.

The absolute FoR, or environment-centered coordinate system, makes use of angles derived from cardinal directions or landmarks external to the figure/ground array (Levinson 2003). In this system, search domains are designated by fixed bearings independent of ground objects and the speaker's location. For example, the house in figure (6), which is the ground object, functions as an intersection between the north-south and east-west orthogonal axes. Thus, the figure can be located by following the west half-line from the house. In other languages, the fixed bearings may be abstracted from the landscape, such as the land-sea axis in a number of Austronesian languages (see 2.4.1) (Blust 1997; Palmer 2002). In short, the absolute FoR generates its angular specifications by projecting bearings fixed in the environment.

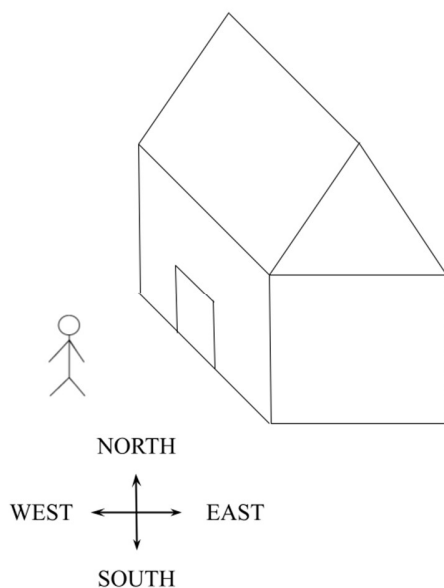


Figure 6. The absolute frame of reference. The figure (depicted as a stick figure) is located west of the house, the ground object.

These FoR are, nonetheless, only broad typological categories, and speakers of different languages have the capacity to employ one or more FoR (Levinson 2003). Speakers of English, for instance, are capable of using all three FoR. Furthermore, in each language, FoR will work differently. Yet, Levinson’s tripartite division should logically account for all FoR at the highest level of abstraction. However, a point of interest is the way in which FoR interact with each other and develop in a language. For example, the facets of an intrinsic FoR in some languages are abstracted body parts that are then applied onto objects. In such languages, the words “head” and “foot” correspond to “top” and “bottom”, respectively. It is also often the case that relative FoR develop out of a pre-existing intrinsic FoR and appropriate its angular specifications, which is evidenced by the ambiguity of the English word “front” in example (11). The word “front” may either designate the intrinsic FoR, as in (12), or the relative FoR, as in (13).

- (11) John stood in front of the car. (Ambiguous)
- (12) John stood at the car’s front. (Intrinsic)
- (13) From Jane’s point of view, John stood in front of the car. (Relative)

For the purposes of the present study, Levinson's (2003) treatment of FoR will be the theoretical framework used to analyze the Formosan languages. However, it must be noted that there are competing theoretical frameworks to Levinson as well as new developments since. For alternative viewpoints, see Talmy (1983; 2000) and Zlatev (2010).

2.3 Motion Event Typology

Motion as a subfield of space refers to the change of location of a figure from one point in time to another, as noted in section (2.1) above (Talmy 2000; Levinson & Wilkins 2006). Thus, an instance of motion is called a motion event, and verbs that denote them are called motion verbs. In addition, the trajectory that the figure travels along between locations is termed the path of motion or simply, path. There are different ways in which languages can refer to path. One such way is through a subtype of motion verb – path verbs – which, in relation to ground, specify a vector of the path. In examples (14–16), the English path verbs “leave”, “traverse”, and “enter” specify different path-vectors of the ground. In (14), the path starts from the field, whereas in (16), the path ends at the field. Finally, the field is between the start and end of the path in (15).

- (14) John left the field. (Source)
- (15) John traversed the field. (Milestone)
- (16) John entered the field. (Goal)

Following the terminology of Jiang (2006)⁵, there are three⁶ major points along the path-trajectory: source, milestone, and goal (see figure 7). Collectively, these are the local roles encoded in path verbs which specify what part of the path the ground comprises, as in examples (14–16). Thus, the path verbs “leave”, “traverse”, and “enter” encode source, milestone, and goal, respectively.

⁵ In my opinion, Jiang (2006) has neatly synthesized competing views on the concept of path. For alternative perspectives, see Zlatev (2003) and Talmy (2000).

⁶ Jiang (2006) also reserves the local role “location” for self-contained motion. Since self-contained motion is not within the scope of the present study, it is not discussed further.

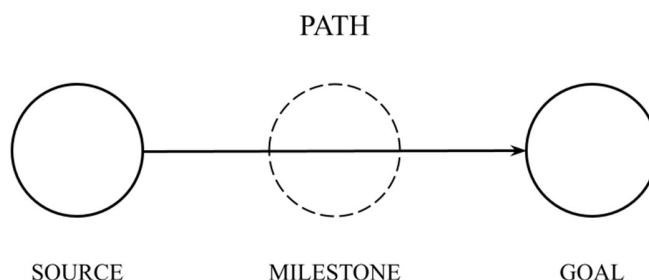


Figure 7. A path-trajectory with the local roles of source, milestone, and goal outlined (adapted from *Three interpretations of Path* [Figure], by Jiang 2006).

However, local roles do not necessarily need to be encoded in verbs. They may also be encoded outside of the verb in satellites (Talmy 2000; Levinson & Wilkins 2006). In examples (17–19), the English prepositions function as satellites: “from” corresponds to source, “through” to milestone, and “(in)to” to goal.

- (17) Jane went from the field. (Source)
- (18) Jane went through the field. (Milestone)
- (19) Jane went (in)to the field. (Goal)

Furthermore, motion events can be characterized by how the figure moves: the manner of motion or simply, manner (Talmy 2000; Levinson & Wilkins 2006). Manner can be encoded directly in the verb, and to differentiate such motion verbs from those outlining path, these may be called manner verbs. Although manner does not determine path, it may affect its shape and contour. Examples (20–22) contain different kinds of manner verbs, each having an effect on the contour of the path. (20) and (21) turn the path vertical, while in (22), the path travels through the air.

- (20) John climbed out of the cave.
- (21) John slid down the hill.
- (22) John flew to the desert.

As a result, languages have developed different strategies to handle the conflation of path and manner in motion verbs. According to motion event typology pioneered by Talmy (1985; 2000), there are two primary ways in which languages may frame motion verbs: either path is expressed in the main verb, leaving manner as an adjunct, or manner is expressed in it, in which case, path is realized in satellites. Thus, languages that opt for the latter are classified as satellite-framed vis-à-vis verb-framed. The classic examples in support of this typology are from the satellite-framed Germanic languages and verb-framed Romance languages, as in examples (23–24). In (10), the main verb *sprang* “ran” expresses manner, while path is realized in the satellite *in (i)* “into”. On the other hand, path is realized in the main verb *entré* (entered) in (24), while manner is expressed as the gerund *en courant* “running”.

(23) Oscar sprang in i köket. (Swedish)

Oscar sprang in i kök-et
 Oscar run.PST PART in kitchen-DEF.SG
 Oscar ran into the kitchen.

(24) Jean est entré dans la cuisine en courant. (French)

Jean est entré dans la cuisine en courant
 Jean AUX PST.PTCP in DEF.SG kitchen PREP PRS.PTCP
 Jean entered the kitchen, running.

Motion event typology as conceived by Talmy (1985) has undergone significant revisions and developments since its inception. One of the main challenges is the existence of so-called equipollently-framed languages, like Thai (25) (Zlatev & Yangklang 2004; Slobin 2004). In such languages, it seems that path and manner may be split across two verbs of equal status in contrast to the disparity between syntactic units in both verb-framed and satellite-framed languages. This is of particular relevance to the present study whose languages demonstrate serial verb constructions (SVC) (see 2.4), likely candidates for such a classification. Yet, it is argued that SVC languages are not necessarily equipollently-framed, such as in the case of the Formosan language Takituduh Bunun (Bogren Svensson & Blomberg 2026). As such, the Formosan languages will first be analyzed according to the initial verb/satellite dichotomy, and second, whether they could be considered equipollently-framed.

- (25) Prawat doen khâw pai hông.
 Prawat run enter go room
 Prawat ran into the room. (Thai) (Bogren Svensson & Blomberg 2026).

2.4 The Austronesian Context

The Austronesian language family is the second largest in the world by number of languages and stretches across entire oceans (see figure 8); yet, it has as its homeland the island of Taiwan (Blust 2019). It is in Taiwan where nine out of the ten primary branches of Austronesian are spoken: the Formosan languages. The tenth primary branch is Malayo-Polynesian, which emigrated from Taiwan and settled across much of Oceania on islands and atolls, where it diversified. There are numerous unifying characteristics of Austronesian languages, not least of which is how the spatial domain is construed, which will be discussed below.

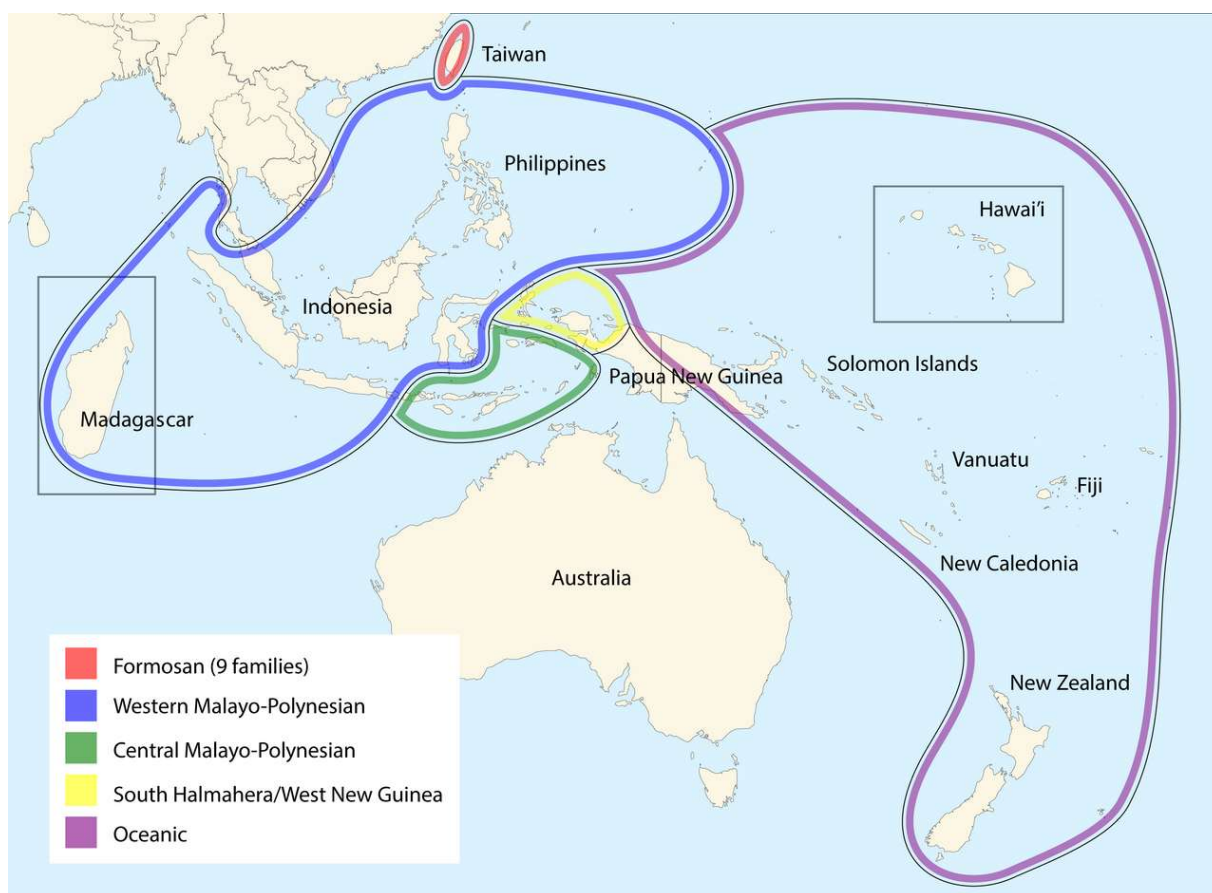


Figure 8. Map of the Austronesian language family ([Figure], by Coretta 2015).

The absolute FoR is predominant in Austronesian (Palmer 2002). While intrinsic and occasionally relative coordinate systems are also employed, the main way to locate objects is to relate them to geographical reference points. Especially salient environmental features may then be grammaticalized as fixed directions. The most common horizontal axis is the sea-land axis, followed by the sunrise-sunset axis, which may correspond to north-south and east-west, respectively, as in the case of Longgu (Hill 1997). Other features may also be grammaticalized, such as coastlines, rivers, sea currents, and prevailing winds (Palmer 2002). Furthermore, the usage cases of specific axes may be highly context-dependent, even systematized to certain circumstances, such as in the case of New Caledonian languages where there is a macro-system for describing relations across whole islands and a micro-system for valleys, villages, and houses (Ozanne-Rivierre 1997). In short, the spatial domains in different Austronesian languages seem to use a similar underlying strategy – grammaticalization of their insular environs – and as a result, have the hallmarks of a typology of space (Senft 2017; Schlossberg 2025; Francois 2003).

Another prominent feature of Austronesian languages is the presence of serial verb constructions (SVC) (Senft 2008). In such constructions, an event may be described by more than one verb that is of equal status with respect to subordination (Zlatev & Yangklang 2004). However, the cross-linguistic variation in SVCs makes the feature hard to pin down and further generalizations difficult (Senft 2008).

In conclusion, further research into Formosan languages will likely be of considerable significance in the study of Austronesian languages in general. For the purposes of the present study, the Formosan languages will be discussed within the broader context of Austronesian spatial language. Primarily, evidence of an absolute FoR will be sought for. Such evidence might indicate whether the coordinate systems follow the Austronesian pattern in being derived from, and adapted to, their environment. With regard to SVCs, a comparison can be made between the Formosan languages investigated and other Austronesian systems. In terms of BLCs, there are studies in some other languages (see Dunn et al. 2007 and Garcia-Laguia 2022), but for the purposes of this study, there is not a conclusive typology to relate the Formosan languages to.

2.5 The Formosan Languages

The Formosan languages are the members of the Austronesian language family spoken on the island of Taiwan (see figure 9) (Blust 1999). Together, the Formosan languages comprise nine out of the ten primary Austronesian branches (for contrasting views, see Roos (2009)). The languages under investigation are Puyuma (Puyuma), Saaroa (Tsouic), and Paiwan (Paiwan), the spatial domain of which is relatively understudied (see 2.6). While Paiwan and Puyuma are located on the plains and in the mountains of the southern coastland of Taiwan, Saaroa is situated further inland. The Formosan languages are spoken by the indigenous community of Taiwan. In recent years, there have been revitalization efforts to preserve the Formosan languages. Yet, they are still considered endangered or even moribund, as is the case of Saaroa (Pan 2012).

Saaroa (also known as Lha'alua), is spoken in southern Taiwan in the central, mountainous regions across several villages in Taoyuan and Namasia Districts (Pan 2012). Its speakers are divided into four main ethnic communities: Lhilhala, Paiciana, Talicia, and Vilangane. In terms of its grammatical profile, Saaroa has verb-initial word order (VSO) and a three-way case system. It has a rich morphology with reduplication and affixation as well as demonstrating a voice/focus system typical of Austronesian. It also has serial verb constructions.

Paiwan is spoken in the south of Taiwan by the coast in Pingtung and Taitung Counties by the ethnic Paiwan people, which may be divided into two main ethnic groups: Raval and Vucul (Chang 2006). There are several dialects. In terms of its grammatical profile, Paiwan has a verb-initial word order (VSO) and a case system. It has a rich morphology with reduplication and a highly productive system of verbal affixation. In addition, it demonstrates an Austronesian voice/focus system as well as serial verb constructions.

2.6 Previous Work on Formosan Spatial Language

The field of Formosan spatial language is relatively understudied. Apart from its cursory treatment as part of other works on the Formosan languages, there are to the author's knowledge only three primary studies on Formosan spatial language specifically. These are: Bogren Svensson's & Blomberg's (2026) analysis of motion events in Takituduh Bunun, Li's (2005) work on frames of reference in Paiwan, and Jiang's (2006) thesis on Kavalan spatial conceptualizations. Therefore, the Formosan languages can be said to be undocumented and poorly documented languages with respect to spatial language. The aforementioned studies have served as inspiration to the present study and will provide important points of comparison in the discussion (see 5.). Unlike them, however, the present study examines several subfields of the spatial domain at once, including BLCs, of which there have been some studies (see Dunn et al. 2007 and Garcia-Laguia 2022). Hence, even though spatial language has been studied in Paiwan, the present study will be more comprehensive. The previous studies will be summarized below.

The focus of the study by Bogren Svensson & Blomberg (2026) is on the morphosyntactic and semantic properties of motion events in Takituduh Bunun. Specifically, the study is centered on the motion prefix *u-*. It can attach to various locative nouns in order to encode translocative motion and thereby derive new path verbs. The authors argue that this process of derivation is the result of the movement of *u-* within the syntactic structure. In

addition, with regard to Talmy's motion event typology, the study shows that Takituduh Bunun has the ability to serialize manner-of-motion verbs together with such path verbs – although the latter are subordinate to manner verbs in structural hierarchy. Accordingly, the authors analyze them as satellite-framed structures. As a result, it is argued that existing typologies of motion events – namely verb-framed and satellite-framed languages as well as refinements such as equipollently-framed languages – must take into account serializing languages like Takituduh Bunun, which exhibits both verb-framed and satellite-framed structures.

Li's (2005) work on spatial frames of reference (FoR) in Paiwan shows how speakers make use of different kinds of FoR in different environments. The paper applies Talmy's (1983) terminology on FoR in analysing Paiwan, which comprises ground-based, field-based, guidepost-based, and projector-based reference frames. It also investigates fictive motion. Systematically, the study demonstrates what constructions are used to express each kind of FoR in Paiwan as well as their usage cases. Thus, the paper is able to answer which FoR is most likely to be used in what environment. The results indicate that projector-based FoR corresponds to micro-oriented environments and field-based FoR to macro-oriented environments.

Spatial conceptualizations in Kavalan are studied in detail by Jiang (2006). On the basis of spontaneously told narratives and frog stories⁷, the study investigates how spatial reference is realized linguistically in Kavalan, and specifically, how motion events and FoR are coded and conceptualized. In terms of motion events, the study finds that Kavalan may be classified as a verb-framed language based on the results from the frog stories. Even though it is a serializing language, the author concludes that, when comparing it to the results of frog stories from other languages, the Kavalan results are closest to verb-framed languages. In terms of FoR, Kavalan speakers most often employ the geocentric (absolute) FoR in route descriptions to wayfinders. This may be due to the geographic layout of the village in which the Kavalan speakers live, where the fixed bearings correspond to features in the local environment, such as east-west to land-sea and north-south to monsoon winds.

⁷ Frog stories refer to a well-known task in which speakers are asked to describe a sequence of pictures involving a frog in different scenes. The different pictures together form a loose plot (Jiang 2006).

3. Method and Material

The present study is a qualitative, comparative, and typological study. It is qualitative in the sense that its primary materials are transcribed, glossed, and translated collections of folktales from which representative examples of the Formosan languages under study may be retrieved. It is comparative in the sense that it analyzes and compares three languages that, while different, belong to the same language family and whose speakers reside in the same place: the island of Taiwan. It is typological in the sense that, based on the narrative samples, it classifies the languages according to certain types with regard to the spatial domain in general as well as in Austronesian. In short, it constitutes a kind of corpus study into spatial language.

The results of the present study will be limited in scope due to the restricted nature of its materials, which, while useful, only provided a relatively small amount of data. Since the materials are first and foremost fictive texts, the correspondence between linguistic expressions and the spatial relations they indicate are not possible to verify precisely. Thus, how the spatial domain is construed in each respective language can only be inferred from the texts. Yet, the texts do provide positive examples, even if only a handful (see 4.). Therefore, if the texts are representative of the languages, then it is possible to say with a degree of confidence that a specific linguistic feature is present in the Formosan languages. However, without the ability to follow up on and test the results, their exact usage cases remain indeterminate.

First follows descriptions of the corpora – the collections of folktales – language by language (3.1). Then, the methodological process for how a list of search terms was created will be explained (3.2). Lastly, what pre-emptive measures the present study has taken against ethical issues will be reviewed (3.3).

3.1 Collections of Stories and Grammars

The methods of the present study (see 3.2) have been applied onto three main sources – one from each Formosan language under investigation – which constitute its materials. The sources are transcribed, glossed, and translated folktales collected from consultants of local communities by

linguists. The main source on Puyuma is *Words of the Puyuma Elders* by Cauqelin (to appear)⁸, on Saaroa *Saaroa Texts* edited by Li (2023), and on Paiwan *One hundred Paiwan texts* by Early and Whitehorn (2003). In addition, twelve of the Paiwan texts come from one of the earliest written sources on Formosan languages, the Japanese collection of folktales by Ogawa and Asai from 1935, *The myths and traditions of the Formosan native tribes (texts and notes)*.

Broadly, the folktales touch on several different topics, ranging from religious narratives and ceremonies to everyday life. The former includes creation stories, flood myths, descriptions of burial rituals, Christian sermons and prayers, and legendary histories of the Formosan people and the island of Taiwan. The latter includes interesting or quotidian events, for example: a retelling of a recent hunt, a conversation between a husband and wife, a farewell to a teacher, a description of working in the fields all day, songs, and descriptions of the natural environment. The vast majority of examples analyzed as part of the present study have been sourced from these folktales.

Furthermore, in order to make use of the collections of folktales, grammars of each language had to be consulted: for Puyuma, *A reference grammar of Puyuma, an Austronesian language of Taiwan* by Teng (2008); for Saaroa, *A Grammar of Iha'alua, an Austronesian language of Taiwan* by Pan (2012); and for Paiwan, *A Reference Grammar of Paiwan* by Chang (2006). For the sake of clarity and consistency, some examples analyzed as part of the present study have been sourced from these grammars.

3.2 Search Terms and Analytical Methods

In order to find representative examples from the Formosan languages in each respective subdomain under study – BLC, FoR, and motion events – a list of search terms was created (see appendix 1). Then, after scanning the corpus texts with Optical Character Recognition (OCR) software, search terms could be inputted to efficiently locate relevant examples. The process is described below.

First, a list of search terms was created in English, the target language of each text. The search terms are based on common words that signify BLC, such as “is”, “at”, “on”, and “in”,

⁸ The author wishes to thank Josiane Cauqelin for graciously giving her permission to use her upcoming book in the present study.

FoR, such as “front”, “north”, “upriver”, and “landward”, and motion events, such as “enter”, “to”, “run”, and “come”. Based on the glossing, the exact morphemes and words in the source languages could be identified.

Second, once the equivalents of the target words had been found in the source language, these replaced the English search terms. Thus, a second list of search terms in the source languages could be created. The purpose of this second step is to exclude English false positives and to locate all instances of the morpheme/word regardless of glossing or translation. For instance, the English search term “left” highlighted both the FoR and instances of the past tense of “leave”. In other cases, the same word in the source language would be translated differently between stories and so would not consistently appear in a search.

Third, after having collected a set of examples for each language and analyzed them based on the list of search terms, the list was expanded to include identified grammatical morphemes that also conveyed spatial relations – such as adpositions, case markers, and affixes – which the prior list failed to highlight. With these in hand, more examples could be collected and analyzed. In addition, certain terms could be more easily cross-referenced.

The main issue with the process used in the present study is its reliance on the English translations and glossings. As mentioned above, the same word can be glossed differently in different sentences and between different sources. Furthermore, by using English as the target language, the spatial descriptions of the Formosan languages are interpreted through the lens of English spatial language. Thus, there is a risk of the English translations misrepresenting the original meaning, an issue that cannot be rectified without asking a consultant.

The resulting set of examples from this process was analyzed. First, the examples were categorized according to subfield: BLC, FoR, and motion events. Then, the figure and ground in the examples were identified as well as the word or morpheme indicating the spatial relation between them. For instance, in examples of motion events, after locating figure and ground as well as classifying the verb as either a manner or path verb, the local role of the path verb could be identified. Instances of a path verb and which local role it encoded were mapped. For FoR, once the word designating the angle had been identified, it was a matter of reconstructing the context in order to determine the type of FoR. In order to find the BLC, grammatical constructions that had been identified in the examples collected from the folktales were cross-referenced with grammars. This resulted in a schematized BLC for each language.

Some of the examples could not easily be classified. For instance, examples that had incomplete glossing, a translation difficult to parse, or too complex grammatical structures could not be analyzed satisfactorily in the present study. Furthermore, some examples could be interpreted in different ways, especially whether an intrinsic or relative FoR is indicated (see 4.2). In such cases, the context of the example sometimes proved useful, while at other times, the ambiguity could not be resolved. Where possible, ambiguous examples were excluded. In other cases, grammars could be referenced to verify the analysis.

3.3 Ethics

The present study has been conducted in accordance with the ethical guidelines of Humanistiska och teologiska fakulteterna (2025). These stress the importance of maintaining the integrity of individuals with regard to sensitive information that could be traced back to them. In the course of the present study, the main points of sensitive information that have been taken into account are: ethnicity, religious or philosophical beliefs, and sexual life. Such details are present in the publicly available source material on which the present study relies. In terms of ethnicity, the language that an individual speaks is a potential indicator. Therefore, the role of language informant that the individuals play could possibly indicate their ethnic background. In terms of religious or philosophical beliefs, a number of the folktales contain descriptions of religious ceremonies and belief systems. In terms of sexual life, some of the folktales are of a sexually explicit nature and may indicate the sexual orientation of the story tellers.

Another point of consideration is the ability to identify individuals. In this case, the source material contains photographs as well as some personal details of informants. These could potentially be used to identify these individuals, and in conjunction with the sensitive details in the folktales, there is a risk of connecting sensitive details to identifiable persons. Furthermore, even if most of the informants are by this point in time likely deceased, their descendants might not be, and their integrity should also be considered. As such, even though the source material is already published, and consequently, the personal details of these individuals public, those details will not be reproduced in the present study.

At no point has generative AI been used in the process of developing, writing, or proofreading the present study.

4. Results

From the collections of stories, as well as from the respective grammars, a number of examples have been collected which represent the spatial topics under investigation in each language: basic locative constructions (BLC), frames of reference (FoR), and motion events. These will be presented below with accompanying glossing, translation, and analysis. In (4.1), examples of the BLCs of each language will be shown. In (4.2), examples of FoR in each language will be presented. Finally, examples of motion events from each language will be reproduced in (4.3). Some of the issues with the collection process in general will be discussed below (see 5.4).

In total, the present study has retrieved 171 examples from the collection of folktales and grammars (see table 1). These can be broken down by language, in which case there are 56 examples from Puyuma, 62 from Saaroa, and 48 from Paiwan. These can be further divided by spatial topic. Notably, there are only a handful of examples of FoR from each language, with Paiwan having zero. However, in the case of FoR, there are other examples that may be used and that imply a certain FoR, even if they are not strictly examples of static FoR (see 4.2). Nevertheless, as noted in (3.), what the examples may indicate about Formosan spatial language is limited.

	Puyuma	Saaroa	Paiwan
BLC	22	23	15
FoR	2	5	0
Motion events	32	34	33
Total	56	62	48

Table 1. Total number of examples of basic locative constructions (BLC), frames of reference (FoR), and motion events collected from the folktales and grammars of the Formosan languages.

4.1 Basic Locative Constructions

For each Formosan language, examples of basic locative constructions (BLC) have been collected. The constructions extracted from the examples have then been cross-referenced with

grammars of each language in order to properly analyze them. For the purposes of the present study, the most basic form of the BLCs will be schematized. However, more complex constructions that specify in greater detail the spatial relation between figure and ground will also be noted.

In Puyuma, BLCs typically contain the locative verb *ulaya* “exist”, as in (1) (Teng 2008). Note, however, that in the example, the figure “she”, which is the subject argument of the verb, has been omitted. Usually, the overt figure is realized as a NP, as in (2–4). However, zero copula-locative constructions are also permitted, as in (2), where the locative verb has been omitted. The ground may be indicated by a noun phrase, such as with the deictic pronoun in (1) or with a NP in locative case like in (2–4). The locative case marker *i* “LOC” often coincides with a deictic expression, for example *kaɖu* “there”, as in (2).

- (1)⁹ ala ka-ula~ulaya kaɖini.
 maybe might-RED-exist here
 She might be there.
- (2) an Arulawan ʔi, kaɖu i Buʔul, k<əm>a.
 when person.name TOP there LOC place.name, <AF>say.
 When Arulawan stayed in Butrul, it is said.
- (3) ulaya i temuu i puyuma.
 exist SG.NOM your.grandparent LOC puyuma
 Your grandmother is in Puyuma.
- (4) ulaya ku=paysu i papadraran.
 exist 1S.PSR=money LOC table
 My money is there on the table.

A preposition may be included in the NP to specify the spatial relation of the ground to the figure. In (5), the repaired utterance contains a NP with the preposition *sabak* “inside”, which also appears in (6).

⁹ The numbering of the examples restarts in the results sections (4.) in order to separate them from previous examples.

- (5) papə|j i tu-ruma?, kaɖu i sabak kana ruma?
 pregnant LOC 3GEN-house there LOC inside INDF.NOM house
 While pregnant, she stayed in her house.
- (6) i sabak kana trabak.
 LOC inside DEF.OBL box
 Inside of the box.

In summary, the Puyuma BLC consists minimally of a NP tied to the locative verb *ulaya* “exist”, which is optional (a). The figure may be realized as a NP. The ground NP may take the form of a deictic expression or a NP in locative case, which may be expanded with prepositions.

- (a) Puyuma BLC:
 (ulaya) + figure + ground
 LOC verb NP NP (LOC case)

In Saaroa, BLCs typically make use of the verb *aru* “exist” in conjunction with the verbal prefix *aa* “be.LOC” which marks the ground, as in (7) (Pan 2012). However, both *aru* “exist” and *aa* “be.LOC” can be used independently, as in (8–10). In these examples, the ground is usually a NP marked by the oblique case. The ground marked by *aa* “be.LOC” can also be a deictic expression, as in (10).

- (7) m-a-aru a m-aa-miararuma taalhiapeta.
 AV-STAT-exist CORE AV-be.LOC-village firefly
 Fireflies are in the village.
- (8) maacu ka vutuŋu n kiariari a tamu tumaalaə
 concerning NOM deer OBL past LNK really many
 m-aa na a-lii-liuŋ-a.
 AV-be.LOC OBL IRR-RED-around-LOC
 There were many deer in this neighborhood in the past.
- (9) li-m-a-aru=amu n kaŋvuŋa.
 PFV-AV-STAT-exist=1INCL.NOM OBL Kalhevenga

We have been in Kalhevenga.

- (10) “*kuu=kia a-acalivi na ifaku ka m-aa naani=aku,*”
 not=please IRR-pass OBL 1SG LNK AV-be.LOC here=1SG.NOM
ami-ami um-acəkaa.
 RED-say AV-get.up
 “Don’t pass by me because here I am,” said the one who got up.

In order to specify the spatial relation between the ground and figure, there appears to be two strategies. The first is the prefix *aa* “be.LOC” to a locative noun, as in (11). The second is to nominalize the ground together with a locative noun, which makes it eligible for oblique case marking, as in (12).

- (11) *m-aa-langica kiu’u m-a-arua a ucani kuuri.*
 AV-be.LOC-top tree AV-STAT-exist CORE one song.thrush
 One song thrush is on the top of the tree.
- (12) “*m-a-arua-arua=aku na ru-ruma-anə*
 AV-STAT-RED-exist=1SG.NOM OBL RED-inside-LOC.NMZ
saa-sarə-ana,” *ami-ami ka tapalu.*
 RED-ground-LOC.NMZ RED-say NOM earthworm
 “I shall always be underground,” said the earthworm.

In summary, the Saaroa BLC consists of the locative verb *aru* “exist” and verbal prefix *aa* “be.LOC” where the prefix marks the ground (b). Based on the examples, the figure is realized as a NP, and the ground is also realized as a NP, usually in oblique case. The NP can be expanded to include a locative noun, in which case the NP must seemingly be prefixed by *aa* “be.LOC” or be nominalized in order to take oblique case.

- (b) Saaroa BLC:

<i>aru</i>	+ <i>aa</i>	+ ground	+ figure
LOC verb	LOC prefix	NP (OBL case)	NP

In Paiwan, BLCs are typically realized as zero copula-constructions, as in (13–14) (Chang 2006). The ground can be realized as a NP, including deictic expressions. In these examples, the ground belongs in a prepositional phrase headed by *i-* “LOC”.

- (13) “i-maza aken” aya a qam.
 LOC=here F.1SG say C ant.eater
 “Here I am,” said the ant eater.
- (14) mare-ałak i-ka-va-vua-an.
 pair-child LOC-main-RED-field-NOM
 There was a family in the fields.

The spatial relation between figure and ground can be specified with a locative noun, in which case the ground is placed in oblique case after the locative noun, as in (15–16).

- (15) manu uzay a djurikuku i-taladj tua taqtaq.
 then there C fowl LOC-inside OBL platform
 There was a cockerel under the platform.
- (16) i-zua va-vaw tua in=qaliw-an.
 LOC-that RED-above OBL PERF=roof-NOM
 She was up on the roof.

In summary, the Paiwan BLC consists of a figure NP and ground PP (c). The ground PP can be expanded to include a locative noun, in which case it takes oblique case marking.

- (c) Paiwan BLC:
 figure + ground
 NP NP (LOC case)

4.2 Frames of Reference

Examples of different FoR will be presented based on the collections of stories from each Formosan language. Per definition, an example of FoR has been selected if it demonstrates a

static angular specification, as noted in (2.1). However, this strict definition has only generated a handful of examples from each language (see table 1 above). For the purposes of the present study, additional non-static examples have been retrieved that, while not necessarily meeting the definition, are suggestive of a certain FoR. The examples will also be classified according to one of the three FoR as explained in (2.2).

In Puyuma, there is evidence for an intrinsic FoR, as in (17). In the example, the locative noun *ɲuway* ‘in front of’ seemingly denotes a search domain extending out from the front of the speaker’s house. The speaker is not in the vicinity of the house, which rules out the relative FoR.

- (17) *naniam* *rumaʔ* *i* *ɲuway-an* *ʔi,* *ulaya*
 1PL.GEN house LOC in.front.of-LOC.NMZ TOP exist
a *puran* *a* *mara-laŋ-an,*
 INDF.NOM betel.nut.tree INDF.NOM RECP-companion-OBJ.NMZ
k<əm>a *naɖu* *na* *lalak.*
 <AF>say those.NOM DEF.NOM child

‘In front of our house, there is a two trunks betel nut tree’, she told those children.

Furthermore, while not strictly examples of FoR, because they do not specify the static position of a figure in relation to ground, the following examples (18–20) contain cardinal directions.

- (18) *ʔ<əm>əpa* *i* *maka-ʔami* *ɖa* *ənay.*
 <AF>go.straight.to LOC DIR-north INDF.OBL water
 He went north towards the river.
- (19) *tu-pu-sabak-aw* *ʔi,* *amaw na* *kaɖu* *kaɖi* *ɖaya*
 3GEN-CAUS.MVT-inside-PF TOP EMPH FILL live here west
i *Kinuʔul* *na* *umaʔ.*
 LOC place.name DEF.NOM field.
 He moved in, then lived in the West of the fields of the men’s house Kinutrul.
- (20) *papəʔi* *i* *kaɖu* *kaɖju* *Babaʔuran* *maka-ʔauɖ* *kana*
 pregnant LOC stay over.there place.name DIR-east DEF.OBL

Raraŋəs.

population.name

Pregnant, she lived over there in Babatruran, east of the Raranges.

In Saaroa, there is evidence for either an intrinsic or relative FoR, as in (21). The locative noun *'ilikusu* “back” may either denote an objective backside of the tree or its relative backside from the viewpoint of the speaker. Another instance of an intrinsic FoR is found in (22), where the locative noun *alhalhapa* “top” is used to indicate the topside of the table.

- (21) m-ita-levenge a ma-m-a-ini na 'ilikusu a kiu'u taisa=na.
 AV-hide-hide CORE RED-AV-STAT-small OBL back GEN tree
 big=DEF

The child hid at the back of the big tree.

- (22) alhalhapa tuu'u ia, m-a-arū utulu tepelha=na sulhate.
 top table TOP AV-STAT-exist three CL=DEF book
 There are three books on the top of the table.

Based on the grammar by Pan (2012), Saaroa has cardinal directions derived from the path of the sun as well as from landmarks on Taiwan, as in (23–25).

- (23) patapualh-a(na).
 set-LOC.NMZ

West.

- (24) uru-a-mit-ane.
 come.out-IRR-BOUND.ROOT-LOC.NMZ

East.

- (25) 'alhipaputakulhulha.
 jade.mountain

North.

In Paiwan, there is evidence for either an intrinsic or relative FoR, as in (26) where the locative noun *likuz* “back” likely denotes its backside relative from the viewpoint of the speaker. In (27), the locative noun *vaw* “above” seemingly indicates the topside of the house.

- (26) manu teng aya mi-layap a sa-tja-i likuz
 then EXCL say AF-fly C go.to<AV>-more-LOC back
 tua lavek.
 OBL sea

But it (or she) said “Tung,” and she flew to the far side of the sea.

- (27) mintu em=djeli-djeli ti sa Pulaluyaluyan i-va-vaw
 sudden AF=RED-laugh F.H H (name) LOC-RED-above
 tua in=qaliw-an.
 OBL PERF=roof-NOM

There was Pulaluyaluyan laughing on the roof.

Cardinal directions are also used in Paiwan, as in (28).

- (28) lakua si-vaik a sa-pa-sa-nava-naval.
 but if-leave C go.to<AV>-cause-go-RED-south
 But they took him down south.

4.3 Motion Events

Examples of motion events have been retrieved from the folktales of each Formosan language. Then, these examples have been categorized according to verb type: path and manner verbs. Some of the common path verbs have been analyzed in terms of what local role they denote. These have also been cross-referenced with other grammatical elements – such as case markers and adpositions – in order to identify whether the local role is selected by the verb, by other grammatical elements, or a combination of both, which may reveal the framing of the motion event. Furthermore, some examples of serial verb constructions have been retrieved and analyzed where such have been found.

The local role in Puyuma motion events seems to be encoded in the verb. The language makes use of path verbs, as in (29–30). In example (29), the figure, *Amilimiliŋan*, moves to the ground, *rumaʔ* “house”, which is denoted by the path verb *ukua* “go” encoding the local role of goal. Conversely, in (30), the path verb *kəmay* “come from” encodes the opposite motion: source. Constant in both examples is the locative case marker *i* “LOC”, which simply marks the ground. Therefore, the different local roles in the motion events seem to be encoded in the verb.

(29) *i Amilimiliŋan la ʔi, m-ukua i rumaʔ.*
 SG.NOM person.name PFV TOP, AF-go LOC house
Amilimilingan went back home.

(30) *ala kəmay i timu].*
 maybe come.from LOC south
 [They] may have come from the south.

Puyuma also employs a productive verbal affix, *u-* “MVT”, to create new path verbs (Teng 2008). The affix is attached to a noun or adposition, as in (31–33). In (31), the verb *murumaʔ* “go house” has been created by affixing (*m*)*u-* “MVT” to the noun *rumaʔ* “house”. Likewise, the verbal affix has been attached to the adposition *sabak* “inside” in (32) and to the adposition *isaʔ* “up, top” in (33), thus creating the verbs *musabak* “go inside (of)” and *muisaʔ* “go up (into)”, respectively.

(31) *aw tu-ʔa[u-aw la m-u-rumaʔ k<əm>a.*
 and 3GEN-carry.with.a.pole-PF PFV AF-MVT-house <AF>say,
 He brought the lovers home, it is said.

(32) *m-u-sabak i taruʔan idu na walak*
 AF-MVT-inside LOC hut that.NOM DEF.NOM child
 The child went back into the hut.

(33) *m-u-isaʔ ɖa taləb, k<əm>a.*
 AF-MVT-up INDF.OBL crude.boat <AF>say
 They climbed up into a taleb boat, it is said.

Puyuma also makes use of manner verbs. In (34), the way in which the insects come out of the jar is specified by the verb *[ak]ak* “come out in a stream”, which also seems to encode source.

- (34) tu-tuwal-ay na təbun ʔi, ma-[ak]ak
 3GEN-open-LF DEF.NOM jar TOP, AF-come.out.in.a.stream
 a tiqul, a gərgər, a walu.
 INDF.NOM hornet, INDF.NOM wasp, INDF.NOM honeybee
 He opened the jar, hornets, wasps, and honeybees flew out.

Puyuma path and manner verbs may intersect in serial verb constructions. In example (35), the path verb *muisat* “go up (to)” encodes upwards movement arriving at a beach, which is inferred in the context of the discourse. However, the manner of motion is encoded separately in the verb *kawaŋ* “walk”. In short, the SVC could approximately be translated as “he went up [to the beach], walking”. Similarly, example (36) combines the path verb *uka* “go” with the manner verb *da[us]* “slip” in a SVC.

- (35) m-u-isaŋ k<əm>a~kawaŋ a[ak]-aw iqu.
 AF-MVT-up <AF>RED~walk take-PF that.NOM
 He used it as a walking stick to go up [to the beach].
- (36) m-uka a-da[u~da[us]-a kaqu kaqu.
 AF-go FUT-RED~slip-IMM there there
 They slid and slid here and there while fleeing.

The local role of motion events in Saaroa seem to be encoded in the verb. In (37), the verb *atukua* “go to” appears to encode the local role of goal. Conversely, the verb *aŋati* “leave” in (38) instead encodes source. This contrast is further exemplified in (39) where both verbs are used in conjunction. In the example, the grounds are both indicated by the oblique case marker *n(a)* “OBL”: the difference is the path verb.

- (37) maacu=amu kiariari m-aŋu-kua na

concerning=1EXCL.NOM ancient AV-go-move.to OBL
 vuu-vuluŋ-a ia, puusasuusu=tamu ka uuru.
 RED-forest-LOC TOP divide=1EXCL.GEN NOM cooked.rice
 When we went to the forest, we would divide our cooked rice.

- (38) rumalaə pu-a-ili=cu=ami ka ina=isa fi-aŋali
 then PU-IRR-return=COS=said NOM mother=3SG.GEN PFV-leave
 Umuuma.
 field

Then, her mother returned from the field.

- (39) maacu ka ʔaʔalua ia, aŋali=cu=ami n
 concerning NOM Saaroa TOP leave=COS=said OBL
 ʔasəŋa m-aʔu-kua n naani kaləvəŋa akuisa.
 Lhasenga AV-go-move.to OBL here Kalevenga when

The Lha'alua people have moved from Lhasenga to Kalhevenga here since.

Saaroa also has distinct manner verbs, which may be used together with path verbs in SVCs, as in (40–41). In (40), the verb *ʔaŋulu* “swim” specifies the manner of motion, whereas *aʔukua* “go to” denotes path. Together, they approximately mean, “they sent the muntjac to go swimming to Alhipaputakulhu”. Similarly, the manner verb *valarə* “climb” is used together with the path verb *cuʔu* “escape (from)” in (41). Thus, they approximately mean, “escaping, he climbed a tree”.

- (40) um-uʔunu=cu n tauruŋ a-paka-ʔaŋulu
 AV-send=COS OBL muntjac IRR-CAUS-swim
 a-p-aʔu-kua n alipaputakuʔu rumalaə pa-ala
 IRR-CAUS-go-move.to OBL Alhipaputakulhu then CAUS-take
 n apuʔu.
 OBL fire

They sent a muntjac to swim to Alhipaputakulhu in order to get a fire.

- (41) m-i-cuʔu m-i-valarə n kiuʔ.
 AV-I-escape AV-I-climb OBL tree

He ran away and climbed up on a tree.

In Paiwan, the local roles of motion events are primarily indicated by verbal affixes that attach to nominal stems, thus creating new “path” verbs, as in (42–43) (Chang 2006). In (42–43), the verbal prefix *sa-* “go to” attaches to the ground and denotes the local role of goal. The resulting motion verb in (42–43) could approximately be translated as “fields-go” and “plains-go”, respectively. Conversely, source is denoted by the verbal prefix *kasi-* “come from” which also attaches to the ground in (44). Likewise, the resulting motion verb could approximately be translated as “from-fields-come”. The verbs *vaik* “go” and *mangetjez* “come” are considered deictic (path) verbs.

- (42) manu vaik a-zua qatjuvi a sa-ka-vua-vua-an.
 then go C-that snake C go.to<AV>-main-RED-field-NOM

The snake went off to the fields.

- (43) manu sa-pairang a tsau-tsau a ma-ɖusa
 then go.to<AV>-plains C RED-being C NUM-two

mare-qali.

pair-friend

Two [male] friends went down to the plains.

- (44) manu mangetjez a qatjuvi kasi-ka-vua-vua-an sa
 then come.AV C snake come.from-main-RED-field-NOM and
 ki-qenetj-i a valaw.
 do-see-PF C spouse

The snake came back from the fields and looked at his wife.

Verbal affixes are highly productive in Paiwan. The verbal prefix *te-* “go to” can also attach to locative noun stems to specify region or direction, as in (45–46) (Chang 2006). In (45), it attaches to *taladj* “inside”, creating a motion verb with the ground *verung nua tsuqu* “hole in a bischoffia tree” in oblique case. On the other hand, there is no ground in (46); instead, *te-* “go to” attaches to an upward direction, meaning “go up”.

- (45) qau li-mutseng a-zua valaw vaik a ɬe-taladj tua verung
 so QAL-angry C-that spouse leave C go.to-inside OBL hole
 nua tsuqu.
 of bischoffia

His wife was angry, and went into a hole in a bischoffia tree.

- (46) sa vaik ti-madju a ɬe-va-vaw.
 and leave F-3 C go.to-RED-above
 So he went up.

SVCs are present in Paiwan and may contain the derived path verbs in conjunction with manners verbs. In (47), the manner verb *tuluq* “run” co-occurs with the path verb *letsasaw* “go outside”. The resulting sentence could approximately be translated as “running, he went outside”.

- (47) min-tuluq anga ɬe-tsasaw.
 AF-run indeed go.to-outside
 And he dashed outside.

5. Discussion

With regard to the research questions (RQ) posed in (1.1), the present study will discuss the results from the Puyuma, Saaroa, and Paiwan folktales. Implications from the folktales are by their nature limited (see 3.). Therefore, all conclusions are highly tentative because they are only what the folktales show. Rather, further research is needed to verify the findings of the present study (see 5.4).

The discussion will center on the subfields of basic locative constructions (5.1), frames of reference (5.2), and motion events (5.3). Possible typological classifications will also be discussed and compared between each subfield per language. The implications of the results for the field of Formosan spatial language in particular, for the wider Austronesian language family, and for the field of semantic typology will also be considered. Finally, future avenues of research will be presented (5.4).

5.1 Basic Locative Constructions

Based on the results from the folktales, the BLCs of Puyuma, Saaroa, and Paiwan have been tentatively schematized in answer to RQ (2) (reproduced below from 4.1). These appear to agree with the descriptions of the BLCs in the respective grammars. However, the number of examples of BLCs retrieved from the sources only amount to over a dozen (see table 1). As such, the prevalence of the BLCs as well as their canonical usage cases cannot be determined. In addition, the BLCs of other Austronesian languages have not been studied extensively (see 2.4). Thus, the results will only be discussed between the Formosan languages and related to semantic typology broadly in answer to RQ (5–6).

(a) Puyuma BLC:

(ulaya)	+ figure	+ ground
LOC verb	NP	NP (LOC case)

(b) Saaroa BLC:

aru	+ aa	+ ground	+ figure
LOC verb	LOC prefix	NP (OBL case)	NP

(c) Paiwan BLC:

figure + ground

NP NP (LOC case)

Comparing the languages in terms of the morphosyntactic structure of the BLCs, the Formosan languages seem to be similar in some respects and differ in others (RQ 4). A commonality between Puyuma and Paiwan in the data is the use of the locative case marker to denote the ground. Similarly, Saaroa employs a locative prefix, although the ground itself is denoted by an oblique case marker. Seemingly, only Saaroa requires a locative verb in its BLC, whereas both Puyuma and Paiwan permit zero copula-constructions. Also, Puyuma *ulaya* “exist” resembles Paiwan *uzay* “there”, although they are translated differently. Speculatively, they might be cognates, and therefore, warrant further analysis.

In terms of semantics, a point of similarity between all languages based on the results is the lack of specification of the precise spatial relation between figure and ground in the BLCs. In English, because the BLC contains a paradigmatic slot for a preposition, the spatial relation can be specified in greater detail without having to rely on more complex constructions. On the other hand, the Formosan BLCs on their own seem to only make use of case marking or prefixing. In other words, they can only indicate an unspecific spatial association between figure and ground, which might cause speakers to rely more heavily on extralinguistic knowledge of how figure and ground are prototypically related. In order to indicate the exact location of figure with respect to ground, the Formosan languages may make use of more complex constructions: prepositions in Puyuma and locative nouns in Saaroa and Paiwan.

In relation to the BLC hierarchy, the data from each language seem to agree with it (see figure 2). The folktales show that the Formosan languages make use of the BLC when the figure is an inanimate, moveable entity in contiguity with ground, which is the most likely scene that BLCs are found in. The BLC is also commonly used for animate figures and for grounds that are place names, as would be expected (Levinson & Wilkins 2006). It remains to be seen whether the other scenes on the BLC hierarchy are also conducive to the Formosan BLCs to further answer RQ (3) (see 5.4).

5.2 Frames of Reference

The examples from the folktales contain different frames of reference that the Formosan languages appear to make use of in answer to RQ (2, 4). The limited number of examples describe both macro-environments and micro-environments. However, some of the examples are ambiguous as to which FoR is used. Notwithstanding, the results may be used to tentatively classify the Formosan languages with respect to FoR and relate them to some patterns in the Austronesian language family and within semantic typology (RQ 3, 5–6).

The Formosan folktales contain examples of an intrinsic FoR. In the languages, there are terms for “front”, “back”, and “top”, among others, which are used to denote search domains in reference to intrinsic facets of the ground objects. However, in the case of Saaroa and Paiwan, some of the examples are unclear as to whether they denote an intrinsic or relative FoR. In any case, the existence of a relative FoR necessarily entails the existence of an intrinsic FoR (Levinson 2003). Furthermore, it is not uncommon for intrinsic terms to become polysemous and take on the functions of a relative FoR, like in English (compare “the car’s left” with “my left”). As such, while it remains indeterminate whether a relative FoR is found in the Formosan languages according to the data, an intrinsic FoR is exemplified in the data.

In addition, the data shows that an absolute FoR may also be present in the Formosan languages, like in most Austronesian languages (Palmer 2002). There are examples where fixed bearings are used in each language. However, based on the folktales, there is no clear, attested case of an absolute FoR used in tabletop space, just in large-scale scenes. Still, the absolute terms themselves reinforce the initial findings by Palmer (2002), which Senft (2017) formalized into a typology of Austronesian (see 2.4). The cardinal directions in Saaroa appear to be derived from the path of the sun as well as a feature of the environment: Jade Mountain. In other words, the common Austronesian strategy to grammaticalize salient landmarks as cardinal directions appears to also be found in Saaroa.

The findings from the present study are corroborated by the papers on Paiwan (Li 2005) and Kavalan (Jiang 2006). The correspondence between intrinsic/relative FoR¹⁰ with micro-environments and absolute FoR¹¹ with macro-environments is repeated in the examples of

¹⁰ In Talmyian terms, ground-based and projector-based reference frames (Talmy 1983).

¹¹ In Talmyian terms, a field-based reference frame (Talmy 1983).

Paiwan, a pattern that seems to be replicated in Puyuma and Saaroa as well. Furthermore, the way in which Kavalan grammaticalized its fixed bearings seems to be similar to Saaroa, only with different environmental features. Rather than the land-sea axis of Kavalan, the Saaroa data indicate that the path of the sun is used, and instead of monsoon winds, Saaroa looks to Jade Mountain as its cardinal north. This might be explained by the different places where the speakers of the languages reside. Kavalan is spoken in the north along the coast, while Saaroa is spoken in the south further inland (see figure 9). Thus, Kavalan speakers are likely more exposed to the monsoon winds, whereas Saaroa speakers live in the vicinity of Jade Mountain, potentially rendering those environmental features especially salient.

5.3 Motion Events

The results of how motion events in the Formosan languages are realized may tentatively be used to classify them according to motion event typology (RQ 2–3). However, the realizations of the motion verbs in each Formosan language seem to differ considerably despite being genealogically related (RQ 4). In addition, based on the data, all three languages could be termed serializing languages, that is, they make use of serial verb constructions (Zlatev & Yangklang 2004). In the SVCs provided by the Formosan folktales, path and manner verbs with potentially equal status may be realized in the same clause. The existence of such SVCs raises the challenge of how best to classify the Formosan languages. However, in order to properly classify them, a thorough treatment of the syntax of their SVCs would be needed, which is beyond the scope of this study. Nevertheless, a typology of Formosan languages can still be problematized with regard to verb-framing, satellite-framing, (Talmy 1985) and equipollent-framing (Zlatev & Yangklang 2004; Slobin 2004).

The Formosan languages all seem to make use of distinct path verbs rather than satellites. Based on the analyzed examples, it is most often the verbs that encode local roles, hence path verbs. Ground is typically signified by case marking, which does not seem to have much bearing on the path of motion. Thus, at a glance, the classification that would initially seem to apply to the Formosan languages is that of verb-framing. This classification is corroborated in the related language of Kavalan, which is also deemed a verb-framed language in comparison (RQ 5) (Jiang 2006). However, the results show that some of the languages have unique strategies in deriving path verbs in addition to SVCs (RQ 6), wherein both path and manner verbs participate

seemingly on an equal footing. This clashes with the canonical definition of a verb-framed language. Thus, equipollent-framing may be a viable alternative, if any of the pre-existing framings are even applicable.

First, Puyuma seems to make use of what may be called typical path verbs. For example, the verbs *ukua* “go” (goal) and *kəmay* “come from” (source) both appear to denote path straightforwardly with regard to a case-marked ground that is realized elsewhere in the clause. However, Puyuma may also create new path verbs denoting translocative motion by way of its highly productive verbal motion prefix *u-*. In the data, the prefix attaches to locative nouns, either to the ground directly or to an adposition, creating such verbs as *muruma?* “go house” and *musabak* “go inside (of)”. The verbal prefix *u-* in Puyuma is overtly similar to the verbal prefix *u-* in Takituduh Bunun as described by Bogren Svensson & Blomberg (2026). If they indeed are the same, then their conclusion for the Takituduh Bunun prefix may also be true for the Puyuma prefix: they may be analyzed as satellite-framed constructions in SVCs headed by a manner verb. As a result, the classification of Puyuma remains indeterminate, although the likeliest candidates would nonetheless be verb-framing or equipollent-framing.

Second, based on the examples, Saaroa also appears to make extensive use of path verbs. In the examples, the local role is signified by verbs, such as *ahukua* “go to” and *aŋati* “leave”¹², whose grounds take the same oblique case marking. These may be used together with manner verbs in SVCs. According to the examples of the SVCs, the path and manner verbs both contain tense and voice markers. As such, the motion verbs can preliminarily be considered of equal status in the clause. Also, the word order of motion verbs seems to be manner-path, whereas in Puyuma it seems to be path-manner. Nevertheless, Saaroa, out of the three Formosan languages studied, seems to be the clearest candidate for equipollent-framing.

Third, out of the three languages, the possible typological classification of motion events in Paiwan is the most complex. Based on the examples, Paiwan does not make use of typical, independent path verbs (beside deictic verbs). Instead, Paiwan path verbs seem to be created through a process of derivation¹³, where verbal prefixes attach to nominal stems, such as to the ground directly or to other locative nouns (Chang 2006). The verbs *sa-kavuavuaan* “fields-

¹² Based on Pan’s (2012) glossing, *aŋati* “leave” has been analyzed as a verb.

¹³ According to Chang’s (2006) analysis. Otherwise, it could be interpreted as an example of incorporation, where the ground is incorporated into the underlying verbal root.

go” and *kasi-kavuavuaan* “from-fields-come” have been derived thus. The local role of the resulting morphologically complex path verbs appear to be signified by the selected verbal prefix. Thus, the prefix *sa-* “go to” indicates goal and *kasi-* “come from” source. The prefix *te-* “go to” attaches to such locative nouns as *taladj* “inside” and *vaw* “above”. Seemingly, this process is similar to the verbal motion prefix *u-* of Puyuma; yet, in Paiwan, there are many more verbal prefixes which not only encode motion, but also local role. Furthermore, the Paiwan data includes SVCs, which may contain both path and manner verbs. As a result, the most promising classification for Paiwan is either verb-framing or equipollent-framing in spite of its atypical path verbs.

As noted by Bogren Svensson & Blomberg (2026), the existence of serializing languages like Takituduh Bunun challenges Talmy’s motion event typology – and even developments like equipollent-framing (Zlatev & Yangklang 2004; Slobin 2004). Based on the examples, the Formosan languages follow suit. Neither Puyuma nor Paiwan can definitively be classified as either verb-framed or equipollently-framed; only in the case of Saaroa is equipollent-framing a reasonable albeit preliminary classification. In the case of Puyuma, the motion prefix *u-* derives a unique kind of path verb. In the case of Paiwan, its path verbs derived from a class of verbal prefixes that denote local role are far from the prototypical path verb. In conclusion, Saaroa – Puyuma and Paiwan especially – show another way in which path and manner of motion can be realized, further problematizing Talmy’s initial dichotomy and pushing the boundaries of linguistic diversity in this subfield of the spatial domain.

5.4 Usefulness of Folktales and Future Research

Overall, an experimental study would be better at investigating spatial language than a corpus study in answer to RQ (1). While corpora may provide a large quantity of examples, it cannot compete with controlled experiments for quality. As noted above, examples of FoR that meet the definition were hard to come by (see 4.). Yet, for practical reasons, an experimental study was not feasible. Nevertheless, the present study may serve as (1) a prototype for how to study spatial language in corpora based on its methods, (2) a preliminary outline of the spatial domain in the Formosan languages, and (3) as a springboard for further research into the Formosan languages.

There are a number of in-person experiments with controlled stimuli that can be performed to complete the outline that the present study has managed to sketch of the spatial domain in the Formosan languages. Levinson & Wilkins (2006) provide several such experiments that can be used to identify and test spatial relations. For instance, experiments using frog stories could shed light on how to classify the Formosan languages according to motion event typology, followed by a more in depth analysis of the syntax of their SVCs. Scenes depicting tabletop space could also be presented to verify whether the absolute FoR is commonly used outside of large-scale spatial scenes.

Another experiment that could be carried out is the “topological relations picture series” Levinson & Wilkins (2006). In it, different scenes are presented to Formosan speakers in order to test the extent to which the BLCs can be used. The results of such an experiment reveal the BLC hierarchy, that is, the prototypical usage cases of the BLC (see figure 2). As attested in the examples in (4.1), the Saaroa BLC can be used to indicate that a figure is located within a community, e.g. a village. However, the BLC cannot be used for birds in trees, a scene that requires further specification, which results in a more complex construction.¹⁴ Therefore, by carrying out such an experiment and comparing the scenes where the BLC suffices with those where it is insufficient – which, as a result, require further specification by way of a more complex construction – a picture may emerge of the BLC hierarchy in Saaroa. Likewise, further research into the BLCs of other Austronesian languages may serve to complete the Austronesian BLC hierarchy.

¹⁴ It is entirely possible that the speaker in this instance decided to be more precise in their telling. In other words, the most basic form of the BLC may suffice to indicate birds in trees without the locative noun being necessary.

6. Conclusion

In summary, the present study has investigated three subfields of the relatively understudied spatial domain of the Formosan languages of Puyuma, Saaroa, and Paiwan. It has sought to answer the research questions of how the spatial domains of basic locative constructions, frames of reference, and motion events are realized in each language as well as what typology they may be classified as within the context of Formosan spatial language, the Austronesian language family, and semantic typology. From a corpus consisting of collections of transcribed, glossed, and translated folktales from each language, the present study retrieved representative examples for each spatial subdomain under investigation by way of a list of search terms.

Finally, the results were analyzed, compared between languages, discussed in relation to the research questions, and problematized with regard to future avenues of research. In short, the Formosan languages each make use of morphosyntactically different, but semantically similar, basic locative constructions. In addition, they all demonstrate both intrinsic and absolute frames of reference, the latter following the general Austronesian pattern of grammaticalizing salient landmarks. However, there were no examples of absolute FoR in tabletop space. Moreover, with regard to motion event typology, the Formosan languages appear to be verb-framed at a glance. Yet, due to utilizing serial verb constructions and having unique processes for deriving path verbs, they cannot definitively be classified as verb-framed or even equipollently-framed.

Rather, what the present study has shown is that more research into Formosan spatial language is warranted. This will indubitably shed more light on both the Formosan languages and the Austronesian language family as a whole. Further research will also reveal more of the vast diversity of spatial language contrary to initial, universalist assumptions. Thus, a fuller picture of the cross-linguistic variation of spatial language may emerge. To that end, the present study, standing as a prototype on how to study spatial language on the basis of corpora, concludes with suggestions on next steps, namely to conduct in-person experiments.

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Appendix 1 - List of Search Terms in English

BLC	FoR	Motion
AM/ARE/IS	ABOVE	AROUND
AT	BACK	ARRIVE
BETWEEN	BEHIND	COME/CAME
BY	BELOW	CRAWL
FAR	BESIDE	CROSS
IN	BOTTOM	ENTER
INSIDE	DOWN	EXIT
NEAR	DOWNRIVER	FLY
ON	EAST	FROM
OUTSIDE	FOOT	GO/WENT
OVER	FRONT	INTO
UNDER	HEAD	LEAVE
	INLAND	RUN/RAN
	LEFT	THROUGH
	LOWER	TO
	NEXT (TO)	OUT OF
	NORTH	OVER
	RIGHT	VIA
	SEAWARD	WALK
	SIDE	
	SOUTH	
	TOP	
	UP/UPPER	

	UPHILL	
	UPRIVER	
	UPSTREAM	
	WEST	