

# Analyzing Taiwanese Indigenous Folk Dances via Labanotation and Comparing Results from Interdisciplinary Studies

Huaichin Hu<sup>1</sup>, Rayuan Tseng<sup>2</sup>, Chyicheng Lin<sup>3</sup>, Likuo Ming<sup>4</sup>, and Katsushi Ikeuchi<sup>1</sup>

<sup>1</sup>Graduate School of Interdisciplinary Information Studies, The University of Tokyo, Japan  
{kaikin,ki}@cvl.iis.u-tokyo.ac.jp

<sup>2</sup>Department of Dance, University of Taipei, Taiwan  
rayuan@utapei.edu.tw

<sup>3</sup>Center for Art and Technology, Taipei National University of the Arts, Taiwan  
cclin@www.tnua.edu.tw

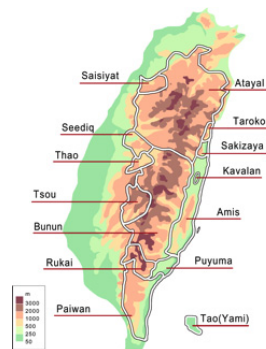
<sup>4</sup>Department of Ethnomusicology, Nanhua University, Taiwan  
lkming@mail.nhu.edu.tw

**Abstract.** Taiwanese indigenous people have abundant cultural identities. Unfortunately, this precious intangible cultural heritage is fading away due to migration and urbanization. This study aims to (1) explore folk dances of these people in order to preserve the dances in digital form, (2) describe those dances by symbolic features extracted for classification, (3) compare results from interdisciplinary studies to help understand social structures among Taiwanese indigenous people. This study showed the basis-step dance classification and the correlation between other disciplines; the correlation of dance relates to language closer than to genetics. The classification described in this paper could serve as the basis for a study of observation of ethnic cultural correlations.

**Keywords:** Taiwanese indigenous people, folk dance, Labanotation, dance classification, genes, language.

## 1 Introduction

Taiwanese Indigenous people, a branch of Austronesian people, were the first to settle on the Taiwanese island, around 5000 years ago [1-3]. The current population is approximately 518,000. Fourteen ethnic groups are identified by the Taiwan government (Fig. 1.1). Taiwanese Indigenous people have their own native spoken languages but no writing system. Thus historical and cultural traditions were conveyed orally from generation to generation. This often causes some traditions to get altered or lost. Additionally, during the 20<sup>th</sup>

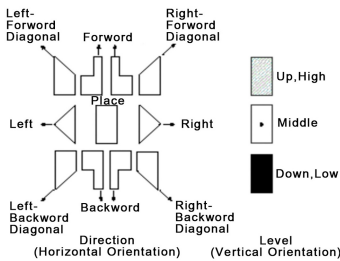


**Fig. 1.1.** Taiwanese indigenous distributions

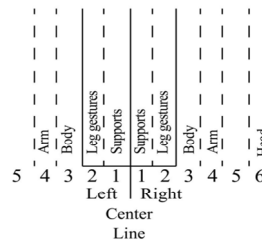
century, immigration, intermarriage, and political unrest caused Taiwanese indigenous people to experience unprecedented crises, including culture and language extinction.

Indigenous peoples and scholars have recognized the value of Austronesian culture in Taiwan, and started to record and research the culture. We are also interested in recording dances of indigenous people. Although many kinds of video-recording tools are available, the dances of Taiwanese indigenous peoples are usually performed by many people, thus recording is not comprehensive, and blind side can easily occur. Therefore, in order to help bridge this gap in our knowledge, this study explores recording and analysis using a systematic tool; a notation of movement called Labanotation.

Labanotation is an abstract symbolic representation useful for analyzing and recording movements [5]. Ground breaking seminal work on the definition of motion notation was carried out by Rudolf von Laban (1879- 1958). In Labanotation the depiction of the elements of horizontal direction, vertical levels, and the parts of the body, have been made as visual and pictorial as possible (Fig. 1.2). Labanotation uses a vertical staff to represent the body, the centerline being the centerline of body, dividing right and left. Fig. 1.3 illustrates which part of the body each column represents in the Standard Staff. Immediately next to the centerline are the support columns. The location adjacent to the support columns represents the leg gestures. Reading sequence is from bottom to top.



**Fig. 1.2.** Labanotation symbols. Symbols on the left represent horizontal directions, symbols on the right are for vertical levels. [5]



**Fig. 1.3.** Standard Staff, every column represents a part of the body [5]

Labanotation is a major dance notation for the analysis and recording of dance movements. Liu et al. and Ping et al. were the representative scholars who used Labanotation to record the folk dances of Taiwanese indigenous people. However, they published few results [6], such as only one folk dance of each ethnic group, and recorded few groups [7]. Thus, Taiwanese indigenous dance records by Labanotation are still insufficient. This is one of the main goals of this research, to record all Taiwanese indigenous dances in Labanotation; we set out from basis-step dances.

In addition, it is also important to investigate what kind of correlation exists between folk dance systems and other fields of study. According some linguistics results [1-3], Formosan languages in Taiwan possess a fairly important status among Austronesian language; the ancient Austronesian people probably spread out from Taiwan around 5000 years ago. From a linguistic point of view, the researches of Li et al. are the most

crucial for investigating the system of Formosa languages. Currently genetic data is being used to explore the relationship between ethnic groups; the most important indicators are mtDNA (Mitochondrial DNA) and the Y-Chromosome. Therefore, maternal ancestors can be investigated by mtDNA [9-13]; the Y-Chromosome can be used to investigate paternal ancestors (Underhill. 2001). But it is worth noting that the usage of different indicators usually resulted in different conclusions. In this study, we referred the mtDNA indicators.

The purpose of this study is to preserve and classify the traditional basis-step dances, and to investigate how the dance classification correlates to other disciplines. The basis-step dances are the most important and representative dances among Taiwanese indigenous people. Additionally, their dances obviously show social relationships. We want to explore how much correlation exists between the dances of Taiwan indigenous people, and other disciplines. The method we adopted was to compare three postnatal environmental factors: geography, social institutions, and linguistics. We also examined the DNA genetic categories of Taiwanese indigenous groups. The main flow of this paper is:

- Investigate the folk dances of intangible heritage assets among 14 ethnic groups of Taiwanese indigenous people.
- Classify the basis-step dances by distinguishing features and attributes.
- Compare the dance classification with three disciplines: social institution, Linguistics, and DNA genetics.

## 2 Representing Taiwanese Indigenous Dances

### 2.1 Investigation of Folk Dances

The most representative dances of Taiwanese indigenous people are basis-step dances, 2-step dance and 4-step dance. In general, basis-step dances becomes various with different songs or music rhythm be changed. Thus, we investigated the most common dances in their festival and summarized the findings in Table 2.1A. Then, we found an interesting correlation between 4-step dance and social institution as shown in Table2.1B.

**Table 2.1. A.** Taiwanese indigenous basis-step dances: 2-step dance and 4-step dance (Y: Exist; N: None); the main directions of dances are clockwise, anti-clockwise, or both.

No.	Group	4-Step	Direction	2-Step	Direction
1	<b>Amis</b>	Y	Both	Y	Both
2	<b>Kavalan</b>	Y	Anti-clockwise	Y	Anti-clockwise
3	<b>Sakizaya</b>	Y	Anti-clockwise	Y	Anti-clockwise
4	<b>Puyuma</b>	Y	Anti-clockwise	Y	Anti-clockwise
5	<b>Paiwan</b>	Y	Clockwise	Y	Clockwise
6	<b>Rukai</b>	Y	Clockwise	Y	Clockwise
7	<b>Bunun</b>	N	×	N	×
8	<b>Atayal</b>	N	×	Y	Anti-clockwise

**Table 2.1.A.** (Continued)

9	<b>Seediq</b>	N	×	Y	Anti-clockwise
10	<b>Taroko</b>	N	×	Y	Anti-clockwise
11	<b>Saisiyat</b>	N	×	Y	Anti-clockwise
12	<b>Tsou</b>	Y	Anti-clockwise	Y	No move
13	<b>Thao</b>	N	×	Y	Both
14	<b>Tao (Yami)</b>	N	×	N	×

**Table 2.1.B.** Summarizes the correlation between 4-step dance and social institution. Red text represents matrilineal society, blue is patrilineal, and green is aristocracy. A more detailed explanation of social institution is in the next section.

4-step Dance	Exist	None
Anti-clockwise	Amis Kavalan Sakizaya Puyuma Tsou	Atayal Seediq Taroko Thao Saisiyat
Clockwise	Paiwan Rukai	Bunun Tao (Yami)

**2.2 Description Based on Labanotation**

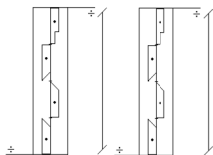
The brief introduction of social institutions are shown as follows:

- (1) **Aristocracy:** There are four levels in their social position that stand for social identity: leader, nobility, warrior, and civilian.
- (2) **Matrilineal:** The right of inheritance is from mother to first daughter, particularly main assets that belong to the mother’s side of the family.
- (3) **Patrilineal:** The right of inheritance only passes to sons, especially to the eldest son, the position in the family for males is usually higher than for females.

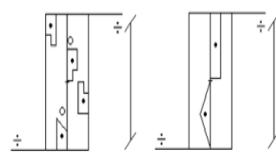
The initial observation from Table.2.1B shows a significant correlation with social institution. In order to present the difference more clearly, Labanotation of these dances are described by category of social institution as follows:

**(1) Aristocracy**

Paiwan and Rukai are aristocracy societies. Their movement direction on 2-step dance and 4-step dance are both clockwise. Fig. 2.2A shows their four-step dances are nearly the same, however, the foot placement of 2-step dances are different: Paiwan’s left foot is in front of the right foot, but Rukai’s feet are in parallel and move very slowly. (Fig 2.2B).



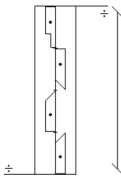
**Fig. 2.2.A.** The 4-step dances of aristocracy are the same; Left is Paiwan, right is Rukai.



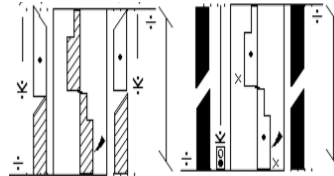
**Fig. 2.2.B.** The 2-step dances, left is Paiwan, right is Rukai; the foot placements are different, but the directions are the same

**(2) Matrilineal**

The 4-step dances of matrilineal groups are all the same (Fig 2.2C). Note the direction of matrilineal groups is opposite to that of aristocracy (Fig. 2.2A), except for in the case of Amis which has both directions; the 2-step dances are similar. The music and dances of matrilineal society are plentiful but not very diverse. For instance, Fig. 2.2D shows Kavalan’s two-step dances have two variations. Furthermore, the most significant difference of Kavalan dances, compared to Amis, is nodding to the right side on the third beat of 4-step dances. The 2-step dances of Kavalan are closer to Sakizaya than Puyuma.



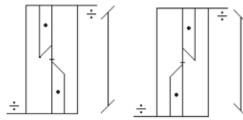
**Fig.2.2.C.** The 4-step dance of Matrilineal; the direction is opposite to that of aristocracy



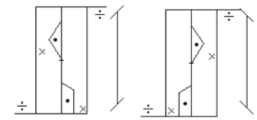
**Fig. 2.2.D.** The variations of Kavalan’s 2-step dances, the foot placement direction is the same, but level and hand motion are different.

**(3) Patrilineal**

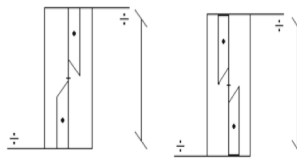
The results indicated the dances of patrilineal are not as rich as matrilineal. Patrilineal groups have no 4-step dance, except for Tsou. Additionally, Bunun and Tao don’t have a basis-step dance. Regarding 2-step dance, Thao have more variations than other patrilineal groups. There are two directions in Thao’s 2-step dances, not like other patrilineal groups which only have one direction. Additionally, they dance in both directions in one song. When they arrange two concentric circles, directions of inner and outer circles differ (Fig. 2.2E). Furthermore, the speed follows musical rhythm to increase or decrease. Sometimes dancing to the end, foot speed indeed approaches running (Fig. 2.2F).



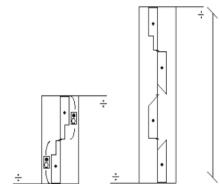
**Fig. 2.2.E.** Thao’s 2-step dances, Adagio version. (Left is clockwise, Right is anti-clockwise)



**Fig. 2.2.F.** Thao’s 2-step dances, Allegro version. (Left is clockwise, Right is anti-clockwise)



**Fig. 2.2.G.** Left is Atayal series 2-step, the left foot is in front; Right is Saisiyat 2-step dance, the right foot is in front.



**Fig. 2.2.H.** Tsou’s dances. Left is 2-step; right is 4-step dance as same as matrilineal groups.

Furthermore, the speed follows musical rhythm to increase or decrease. Sometimes dancing to the end, foot speed indeed approaches running (Fig. 2.2F).

Atayal series groups, including Atayal, Seediq and Taroko, are all patrilineal. Their 2-step dances are the same as Thao’s anti-clockwise direction of Adagio version (Fig. 2.2G). The other dances of Atayal series groups are similar. There are three features of dances such as many jumps, akimbo, and squat motions. The most prominent feature is relevé, dancers raise the body position on one or two feet on demi-pointe. Their hand motions are various, and akimbo motion is the most vivid. Most men’s dances of Atayal series groups are demi-plié, i.e. lower the body weight and squat with feet wider than the shoulders. However, Sasiyat 2-step dance is similar to Atayal series, only the foot position is different. Atayal series is left foot in front; Sasiyat is right foot in front (Fig. 2.2G).

Tsou is the only patrilineal group to have 4-step dances that are the same as matrilineal groups. However, Tsou’s 2-step dance is unique, the position of the feet are fixed in one place while the weight is shifted forward and backward by the knee and upper body, as shown in Fig. 2.2H. Bunun and Tao (Yami) have no basis- step dances, but Tao have various other dances which are much different from other Taiwanese indigenous dances.

### 3 Comparing Results of Interdisciplinary Studies

In this section we compared the dance classification with other disciplines such as social institution, linguistics, and DNA genetics. This comparison indicated a correlation between the different disciplines.

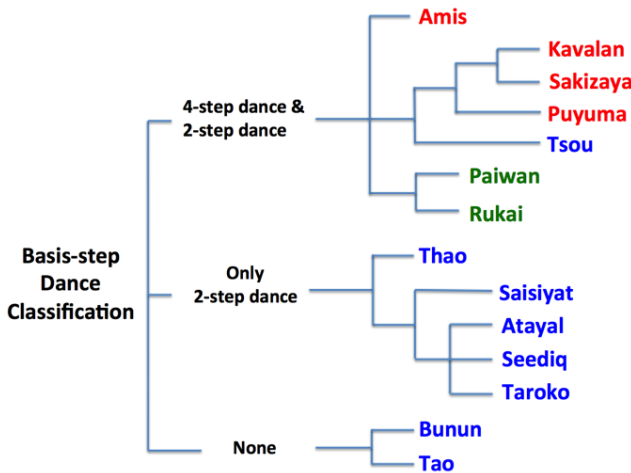


Fig. 3.1. The classification of basis-step dance by Labanotation

The features noted are: (1) in general, each social institution is close, except Tsou. (2) Tsou is closer to matrilineal than aristocracy, and is almost separated from patrilineal groups, (3) Bunun and Tao are distinguished from other groups. (Red is matrilineal; blue is patrilineal; green is aristocracy.)

### 3.1 Classification of Basis-Step Dance

As described above, the basis-step dances were categorized by three features, we considered whether the dance contained 4-step dance and/or 2-step dance. Then, we validate the direction of movement. Finally, we found the feature of foot position. Fig. 3.1 shows the category tree of basis-step dance.

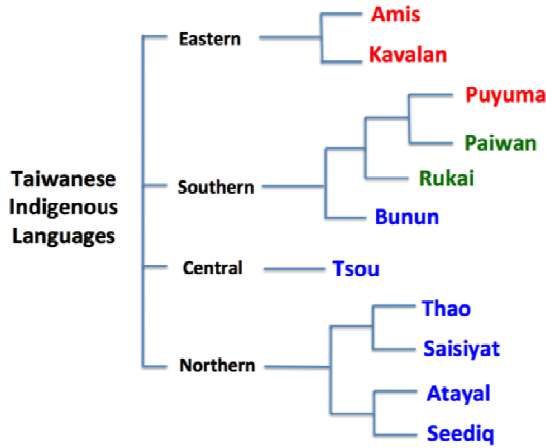


Fig. 3.2. Language of Taiwanese indigenous, cited from Li et al. [4]

The summary is: (1) the branches of Northern and Central are all patrilineal, (2) Eastern branch is matrilineal, However, (3) social institution in Southern branch is mixed. (Red is matrilineal; blue is patrilineal; green is aristocracy.)

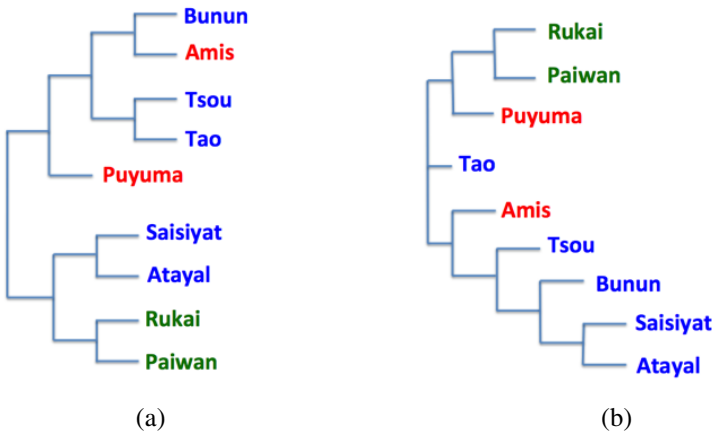


Fig. 3.3. The DNA results

**(a) The DNA tree cited from Tajima et al. [10]**

The features are: (1) Amis and Puyuma are separated by Tao (Yami) (2) Aristocracy close to Atayal and Saisiyat (3) Tsou and Tao (Yami) are very close. (4) Bunun is closer to Amis than patrilineal.

**(b) The DNA distribution cited from Trejaut et al. [11]**

The features show: (1) Amis and Puyuma are separated by Tao (Yami) (2) Aristocracy close to Puyuma (3) Tsou not very close to Tao (Yami), (4) Bunun is closer to patrilineal groups than Amis. The brief summary of (a) and (b) are: (1) the same; (2), (3) and (4) are obviously different. (Red is matrilineal; blue is patrilineal; green is aristocracy.)

### 3.2 The Brief Introduction of Linguistics and Genetics

According to the research of Li et al. [4] and as shown in Fig. 3.2, Taiwanese indigenous people in branches of northern and central Taiwan all belong to a patrilineal society; the eastern branch belongs to matrilineal societies. However, the peculiar result indicates that three types of social institutions appear in the southern branch. Tao, which live in Orchid Island (Lan Yu) are more closely related to the Philippine's Batan Islands language than Taiwanese indigenous Languages [15].

There are many scholars who use gene indicators to explore the genetic kinship of Taiwanese indigenous people and other ethnic groups [9, 10, 12, 14, and 15]. The differences of mtDNA sequence can indeed show the ethnic evolution. Thus, we examined the mtDNA genetic categories of Taiwanese indigenous groups that were referred to in the research of Tajima et al.[10] and Trejaut et al.[11]. Those analysis results showed segmental divergence, see Figs. 3.3(a) and 3.3(b).

### 3.3 Correlation across Results from Interdisciplinary Studies

We found a significant correlation between basis-step dances classification and major disciplines: social institution, Linguistics and DNA genetics. Each discipline presented different degrees of relevance in table 3.4. For instance, ethnic classification in social institution gets the strongest correlation, but only Tsou. Hence, the shared views of these theories on ethnic relationship are summarized: *i.) Paiwan and Rukai are closely correlated. ii.) Atayal series (included Seediq and Taroko) are close to Saisiyat.*

Social institution classification shows the highest similarity to dance classification; it also correlates fairly closely to Geography. The results of the DNA Genetics reference papers showed divergent results, that's why it is hard to distinguish the correlations among ethnic groups. However, Linguistics has a good correlation, but still not as strong as social institution. The correlation between basis-step dances classification and other disciplines are summarized in Table. 3.4.

Finally, in brief, the strength of the correlation is:

**Social Institution > Linguistics > DNA Genetics**



**Table 3.4.** The correlation between basis-step dance classification and other disciplines (○: Strong correlation; △: Correlation; ×: No correlation; ? :Confused correlation; #: No reference)

No.	Group	Social Institution	Linguistics	DNA Genetics
1	<b>Amis</b>	○	○	?
2	<b>Kavalan</b>	○	○	#
3	<b>Sakizaya</b>	○	#	#
4	<b>Puyuma</b>	○	×	?
5	<b>Paiwan</b>	○	○	○
6	<b>Rukai</b>	○	○	○
7	<b>Bunun</b>	△	×	?
8	<b>Atayal</b>	○	○	○
9	<b>Seediq</b>	○	○	#
10	<b>Taroko</b>	○	#	#
11	<b>Saisiyat</b>	○	○	○
12	<b>Tsou</b>	×	×	△
13	<b>Thao</b>	○	○	#
14	<b>Tao (Yami)</b>	△	○	?

## 4 Discussions and Conclusion

Bell et al. present evidence that the cultural differences between populations are far greater than the genetic differences [16]. Because cultural generation is very complex, it may be affected by a several factors, or evolve over a long period of time. According to different backgrounds, each cultural identity has its own respective system; it is really hard to generalize these differences into a simple theory. For instance, in the cultural arts, dance is often accompanied by music. However, Brown et al. showed that the music of Taiwanese indigenous people more closely correlates with genetics than linguistics [17]; we found the opposite correlations between dance, linguistics, and genetics.

Moreover, each discipline has its own advantages, but may also suffer from limitations. For example, linguistics can only indicate relative chronology, not absolute chronology. DNA genetics still has no reliable method to distinguish ethnic groups. Hence, the cooperation and integration of interdisciplinary methods becomes necessary because different disciplines' viewpoints can provide mutual confirmation. Thus, we confirmed the results of interdisciplinary cross-comparison in order to find substantial evidence of correlations between dance classifications and linguistics, and to a lesser degree, genetics.

The brief summary of this paper is listed below:

- Recorded the basis-step dances of Taiwanese indigenous people via Labanotation.
- Analyzed and built the classification of Taiwanese indigenous basis-step dance.
- Compared the dance classification with interdisciplinary. We found the dance classification correlated more strongly to linguistics rather than to genetics.

Although we have investigated ethnic categories from three different disciplines, we believe much more research work is needed to search for a better folk dance classification. An important area for future research in the years to come will be in the refinement of approaches to the analysis of folk dance movements.

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