

Observations on Regional Variants and Handshape Patterns of Six Signs in Filipino Sign Language

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This paper examines the 94 variants of the signs ASO, BITUIN, BATO, BABOY, DAMO and MATALIM in Filipino Sign Language. The signs are part of the field data of the recent dictionary project of the Philippine Federation of the Deaf. The variants are considered in relation to the gender, age, and location of the Deaf signers. The most widely used variants is determined for each lexical item. Phonological structure of the variants is also studied in the context of previously reported handshape patterns. Implications and recommendations for future research on historical reconstruction and language planning are presented.

Key words: Filipino Sign Language, handshape patterns, variants

1. Introduction

1.1 Filipino Sign Language

Manual communication has existed in the Philippines since the 16th century when signing was first documented in Dulac, Leyte (de Prado, 1600; Chirino, 1604). More than 300 years later, in 1907, American Sign Language (ASL), was introduced in a public school for the deaf in Pasay City (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a). This was the start of a century of continuing contact on the local sign language (Abat & Martinez, 2006; Puson & Siloterio, 2006).

Filipino Sign Language, like the 121 other visual languages identified from Deaf communities all over the world (Sutton-Spence & Woll, 1998; Valli & Lucas, 2000; Gordon 2005) has a hierarchy of linguistic structure based on a manual signal primarily expressed through two articulators (i.e., the hands). In addition, a non-manual signal using different portions of the face and body

supply additional linguistic information. The fundamental phonological unit is the Handshape, along with the other parameters of Location, Movement, Palm Orientation and Nonmanual Signal. The units are bundled to form the basic morphological unit, the sign. These are further organized into sentences and discourse (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a).

Filipino Sign Language or FSL is the name that the Filipino Deaf community uses for its visual language (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a). Despite significant support of FSL among its Deaf users (Quilicot, 2007), it remains largely unrecognized by government agencies: i.e., the formal education sector (Bustos & Tanjusay, 2006; Bustos & Martinez, 2008), as well as in the language domains of courtrooms, the workplace, hospitals and mass media (Apurado & Agravante, 2006; Corpuz, 2006; National Sign Language Committee, 2008; Martinez, 2007; Benjamin & Martinez, 2008).

Because ASL is the mother language of FSL, there are understandably strong structural similarities. However, linguistic documentation of structure encounters strong attitudinal resistance, and inaccurate conceptions regarding FSL still abound (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a, c).

Because of this, there are very strong societal motivations for documenting the unique identity of FSL from ASL. Evidence from both structural as well as sociolinguistic sources are essential. Research initiated by Martinez (1993, 1994, 1995, 1996, 2008), together with the pioneering linguistics reference, *An Introduction to Filipino Sign Language* (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a, b, c) presents various data at the levels of phonology, morphology and discourse.

1.2 Sign language research

Phonology of FSL - Handshapes

The reference *An Introduction to Filipino Sign Language* initially assesses the phonological inventory to be comprised of 73 handshapes. Furthermore, it describes several of these handshapes as non-distinctive phonological variants used interchangeably for the same sign (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a). These were observed in traditional signs (i.e., those signs existing for at least 25 years from the present) as well as emerging signs (those arising only in the past ten years) in telecommunications and information technology (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004b). The table below summarizes the clusters of related handshapes as hypothesized by the reference.

Table 1. A summary of handshapes used interchangeably in FSL as reported by PDRC & PFD (2004a)

Cluster	Type of sign observed	Hand involved	Selected Fingers	Thumb
1	Traditional signs – two-handed symmetrical signs	Dominant Hand	A Four selected fingers, round B Four selected fingers, round C Four selected fingers, partially flexed with radial stacking D Index and middle fingers selected with distal joints flexed	Anterior position Lateral position Lateral position No contact with selected fingers
2	Emerging signs – two-handed asymmetrical signs	Dominant Hand	A All four non-selected fingers in, with radial stacking B Index and Middle fingers selected but not spread C Index and Middle fingers selected but spread	Proximal joint flexed Opposed Opposed
3	Emerging signs – two-handed asymmetrical signs	Dominant Hand	A Four selected fingers, proximal joints flexed, middle distal joints slightly flexed B Middle finger selected	Contact with selected fingers Contact with nail of selected finger
4	Emerging signs – two-handed asymmetrical signs	Dominant Hand	A Four selected fingers, round B Middle finger selected	Anterior position Lateral position
5	Emerging signs – two-handed asymmetrical signs	Nondominant Hand	A Four selected fingers B Four selected fingers, round C Index finger selected, round	Anterior position Lateral position Anterior position

These handshapes are illustrated below.

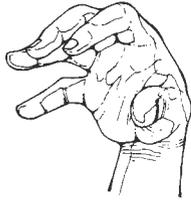


Figure 1. Handshape cluster 1-A

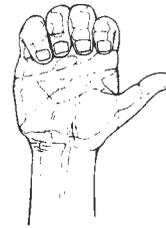


Figure 2. Handshape clusters 1-B & 5-B

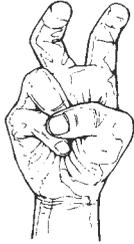


Figure 3. Handshape cluster 1-C



Figure 4. Handshape cluster 1-D

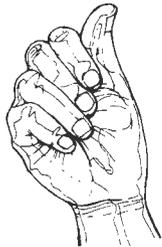


Figure 5. Handshape cluster 2-A



Figure 6. Handshape cluster 2-B

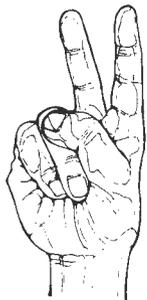


Figure 7. Handshape cluster 2-C



Figure 8. Handshape cluster 3-A

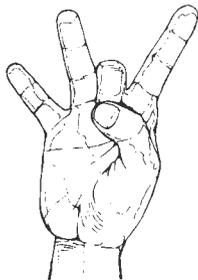


Figure 9. Handshape cluster 3-B

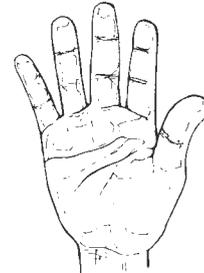


Figure 10. Handshape cluster 4-A

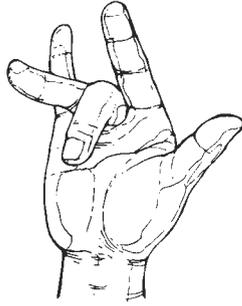


Figure 11. Handshape cluster 4-B



Figure 12. Handshape cluster 5-A



Figure 13. Handshape cluster 5-C

Note that Clusters 3A and 4A, and 3B and 4B, have been observed to co-occur sequentially. Cluster 5, on the other hand, which involves the Nondominant Hand, has been observed with handshapes of the Dominant Hand falling under Clusters 3 or 4.

Lexicostatistics

The Practical Dictionary for Asia-Pacific Sign Languages project of the Philippine Federation of the Deaf (PFD) was faced with the challenge of regional variation in its effort to produce a national dictionary from 2003 to 2007. The geographic and linguistic environments of the Philippines proved to be quite different from parallel lexicographic efforts in Viet Nam, Hong Kong and Cambodia. The PFD analyzed their regional data using the modified Swadesh method of sign linguist James Woodward (Philippine Federation of the Deaf, 2005, 2007) following initial comparisons from their previous work (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a). Preliminary examination of the PFD regional data in the context of demonstrated clusters of related

handshapes and phonological processes was done by Martinez (2008). Because of extensive variation, such analysis proved to be tedious and complex.

Even for spoken languages, lexicostatistics as a method in historical linguistics has its limitations. Liao (2008) recommends specific criteria for determining cognates in sign language data if this method will be employed. More ideal would be a method akin to the Comparative Method, the standard analysis used for reconstruction of historical relationships in spoken languages, which is based on the principle of regular sound change and comparisons of sound change patterns.

2. Data

Six lexical items from the Modified Swadesh List were selected from the field data collected by the PFD researchers for the Practical Dictionaries project (Philippine Federation of the Deaf, 2007). These were selected, based on their varying complexities in structure. Data regarding all the variants observed in the field were tabulated against age, gender and location of users. Results revealed these six items to

include as few as six regional variants (for DOG/ASO) to as many as thirty-one variants (for SHARP/MATALIM). For

all the six items, one-handed and two-handed variants were observed.

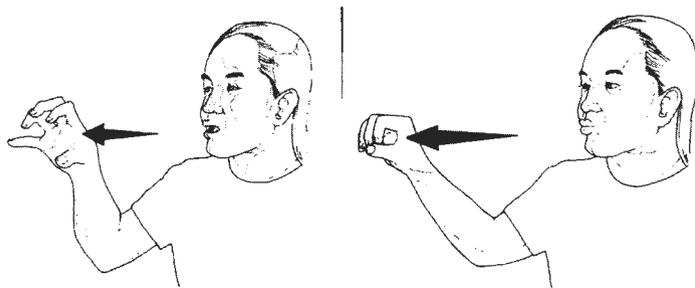
Table 2. Number of one-handed and two handed variants of six signs in FSL

FILIPINO GLOSS	ENGLISH GLOSS	Number of variants		
		1H	2H	Total
ASO	DOG	4	2	6
BITUIN	STAR	4	3	7
BATO	STONE	4	10	14
BABOY	PIG	4	11	15
DAMO	GRASS	3	19	21
MATALIM	SHARP	5	26	31

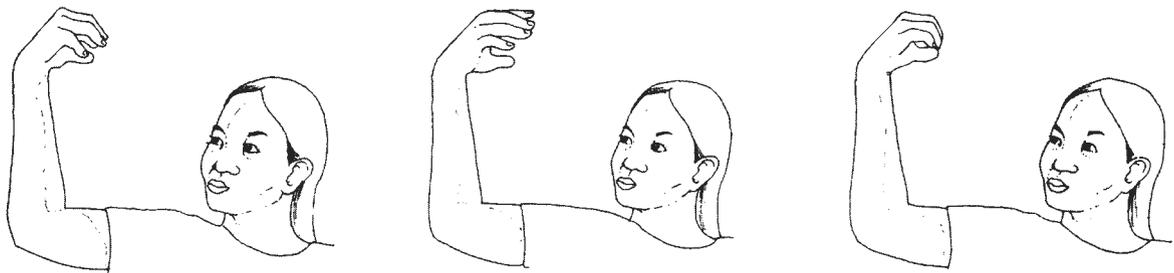
Informants sought were at least 40 years of age or older, although in some areas where there were not enough contacts, younger informants had to be interviewed. Both Deaf male and female informants were included. Rapid notation in the field utilized Stokoe symbols (Philippine Deaf Resource Center &

Philippine Federation of the Deaf, 2004a) and were supplemented with videorecording when possible. Organization of data was done in Metro Manila.

The most widely observed variant for each of five of the six lexical items is shown below.



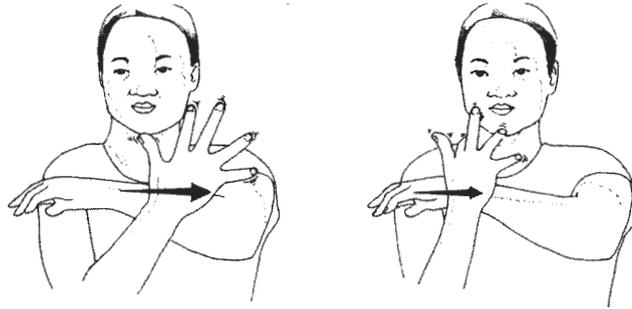
Figures 14a-b. ASO/DOG



Figures 15a-c. BITUIN/STAR



Figure 16. BATO/STONE



Figures 17a-b. DAMO/GRASS



Figure 18. MATALIM/SHARP

For PIG/BABOY, 15 variants were observed among the 22 informants, and a single variant did not stand out.

Each of the top ranking variants was observed in at least three, to as many as seven different regions by at least 20 Deaf signers. The number of users for these six variants ranged from 23 (for

DOG/ASO) to 88 (for GRASS/DAMO). These variants covered a total of 11 regions throughout the Philippines. They were also seen in both males and females in all of the age groups. However, it appeared that most of the users of these variants were either in their 30s or 40s.

Table 3. Number, location and age of informants for most widely used variants of five signs in FSL

FILIPINO GLOSS	# of users	% of users	Regions observed	Age			
				<30 50>	30-39	40-49	
ASO	23	48	NCR, IVA, V, VII	3	2	4	2
BITUIN	30	70	I, III, VI, VII, XII	1	10	8	2
BATO*	30	43	VI, IX, X, XI	1	7	4	1
DAMO	88	59	NCR, III, IVA, VII, VIII, IX, X	11	19	14	8
MATALIM	43	30	III, IV-A, XI	6	2	4	1

*variants #1, 2, 3

Table 4 lists observed handshapes from the regional variants of these six lexical items which follow the proposed clustering patterns reported by the linguistics reference, *An Introduction to Filipino Sign Language* (Philippine Deaf Resource Center & Philippine Federation

of the Deaf, 2004a). The table also indicates the regions where these variants were observed, as well as the number of informants who used them.

Table 4. Handshape patterns, location and number of users observed for six signs

FILIPINO GLOSS	Observed handshape cluster	Region	No. of users/ total
ASO	4A to 3A	IV-A, V, VII, NCR	11 / 23
BITUIN	3A to 4A	1, III, V, VI, VII, XII	28 / 30
BATO	1A, 1B, 1C	VI, VII, VIII, IX, X, XI	18 / 30
BABOY	(Ear location):	III, IV-B, V, VIII	5 / 22
	(Nose location)	III, IV-A, VIII	4 / 22
	(Chin location)	IV-B, VIII	11 / 22
DAMO	3A to 4A	IV-A	2
	(Other)	III, IV-A, V, VI, VII, VIII, IX, X, NCR	81 / 86
MATALIM	3B to 4B; metathesis	IVB	1 / 15
	Modified 3B to 4B	IVA, IX	5 / 15
	Modified 4B to 3B, metathesis	VI	2 / 15
		IVA, VII, XI, I	5 / 15
	3B 4A	IX	2 / 15

3. Discussion

For all the selected six lexical items, the extent of variation cuts across the variables of gender, age and geographical location. Thus, the variants observed are not isolated signs but are

widely used by Deaf Filipinos in different places, as well through several decades and generations. Future efforts should examine further whether this breadth of use holds through for the rest of the core signs in the modified 100 item Swadesh list. This would

empirically document the rich variation and unique nature of the FSL lexicon.

Phonologically, it is interesting to note that handshape patterns (3A, 4A, 3B, 4B, 1A, 1B, 1C) in these variants are also observed in several signers from different regions. This shows once again that these are not isolated occurrences.

The 15 variants for PIG/BABOY, despite being very distinct from one another, still reflect some phonological trends in terms of location. Those variants with a location by the ear are used by signers who are older as compared to those variants signed at the chin. Furthermore, those signed near the nose appear to represent transitional forms.

Metathesis appears to characterize cluster 3 and 4 handshapes, as observed among some of the variants of DOG/ASO, STAR/BITUIN, GRASS/DAMO and SHARP/MATALIM.

The variants for STONE also show all the three handshapes (1A, 1B, 1C), as reported previously in 2004 (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a).

These observations on the phonological structure as well as distribution of the regional variants have

some important implications for the historical study and sociolinguistics of FSL.

In their dictionary project, the PFD performed an initial lexicostatistical analysis on their field data. Further study led to the following proposal of possible relationships between the FSL varieties showing the greatest proportion of indigenous signs (Martinez, 2008):

- Eastern Visayas group
 - Leyte variety
- Southern Luzon group
 - Southern Tagalog variety
 - Bicol variety
 - Palawan variety

The handshape cluster patterns reported in this paper could represent regular handshape change analogous to sound changes observed in spoken languages. It would be helpful here to consider the available information on phonological processes.

Valli and Lucas (2000) describe Hold Deletion and several phonological processes in ASL. A prior study by Liddell and Johnson (1989) also includes Gemination, Reduction and Perseveration/Anticipation. The table below gives a summary of these known processes.

Table 5. Phonological processes in American Sign Language

Process	Nature of phonological change
Movement	Insertion of a Movement segment between signs during discourse
Epenthesis	
Hold Deletion	Elimination of a Hold segment between Movement segments of signs during discourse
Metathesis	Interchanging of locations between segments in a sign
Assimilation	Changes in phonology of a sign as influenced by the segment or sign before or after it.
Gemination*	Merging of the terminal segment of a sign identical to the initial segment of a sign following it
Reduction*	Diachronic relocation of signs either less central to the face, or more central to the lower head and upper body regions of the signing space
Perseveration*	Lingering of an articulator of a two-handed sign (frequently the nondominant hand or NDH) in the signing space during discourse
Anticipation*	Early appearance of the hand of a two-handed sign in the signing space prior to its actual production during discourse

*In Liddell and Johnson (1989)

The *An Introduction to Filipino Sign Language* reference (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a) on the other hand, describes other phonological processes listed below:

Table 6. Phonological processes in Filipino Sign Language (PDRC & PFD, 2004a)

Process	Nature of phonological change
Finger Extension	Extension of either the thumb or the smallest finger/pinky
Segment Deletion	Reduction or complete loss of a Hold or Movement Segment, frequently in the initial position
Modifications of Fingerspelling Space and Signing Space	Change in the size and direction of the space depending on discourse register or the physical signing environment
NDH Deletion / Substitution	Omission of the non-dominant hand, or substitution with an inanimate surface
NMS	Retention of non-manual signals even after the production of the sign by the hands
Perseveration	
Deletion of Manual Component	Loss of sign production by the manual articulators, leaving solely a non-manual signal

Examples of signs resulting from these processes are summarized in the next table, again as first described from the reference (Philippine Deaf Resource Center & Philippine Federation of the Deaf, 2004a). Note that phonological processes and conditioning environments are already proposed.

Table 7. Signs displaying phonological changes (PDRC & PFD, 2004a)

SIGN	Phonological process	Phonological change/ conditioning environment
PANCIT SPAGHETTI	Anticipation by NDH	
GOOD- MORNING	Hold Deletion	2H, 1H
TELL-Pro.1	Segment Deletion Assimilation (Palm Orientation shift)	1 to open 8 in presence of final 5 1 to ext thumb in presence of final 5
THINK-WALA	Assimilation (Palm Orientation shift)	(1) nail 8 to final 5
THINK-SKIP- MIND	Assimilation (Palm Orientation shift)	1 to 5 in presence of final 5
POLITE-NOT	Segment Deletion Assimilation	Open A in presence of initial 5
PROMISE	Assimilation	1 to B as final HS
IGNORE-Pro.1	Displacement (Location) Segment Deletion Movement Epenthesis Assimilation (Palm Orientation shift)	1 to 5 (if initial) *Movement inserted (arc path)
HOME-GO	Segment Deletion ?Assimilation (Palm Orientation shift)	MH or HM?
CIVIL MARRIAGE COUNT	Metathesis	Selected fingers
MENSTRUATION FEEL-LAZY	Deletion of manual signal	Sign is solely NMS

With the collected data and phonological information available, reconstruction of possible historical relationships in FSL analogous to the Comparative Method can perhaps be attempted through the following:

1. Focus on the varieties observed in Eastern Visayas (Leyte) and Southern Luzon (Southern Tagalog, Bicol and

Palawan) as hypothetically distinct.

2. Compile cognate sets for these four varieties based on the core vocabulary documented by the PFD.
3. Determine handshape correspondences following previously documented phonological processes in FSL.

4. Attempt to reconstruct handshape correspondences and handshape change. Related data on the demographics of the signers and history of sign language in the area (Philippine Federation of the Deaf, 2005, 2007) may be useful here.
5. Check for regularity of handshape correspondences and changes.

A second important set of implications arising from treatment of data as reported here could have a marked impact on the sociolinguistics of FSL.

Determining the top ranking variant of each of the five lexical items in this paper shows that these variants comprise about half to three quarters of the total number of users. This can potentially contribute towards standardization efforts for sign language planning. These efforts were initiated in 2005 (Philippine Deaf Resource Center, 2005; Tionson & Martínez, 2007) but have not progressed because of a lack of research inputs and direction. A recent forum of the University of the Philippines Linguistics Department (2009) has attempted to continue these efforts.

Analysis of the entire database of the PFD Practical Dictionaries project following the suggested mechanics used here for the six lexical items shall yield empirically based recommendations for sign language planning and policy formulation. This would contribute to the National Plan of Action which targets development and coordination of sign language standardization for this Philippine Decade of Persons with Disabilities (2003-2012).

4. Conclusion

Analysis of the 94 variants of six FSL signs reveals patterns of use that cut across the variables of gender, age and geographical location. Furthermore, handshape patterns coincide with previously observed phonological processes and conditioning environments observed in FSL, as well as with other sign languages. Thus, the data point to possible extensive and complex diachronic processes in the spread of FSL throughout the archipelago.

5. Recommendations

Determining cognate sets from the field data involving numerous signers is very complex and tedious. Fortunately, several developments in vision-based recognition involving artificial intelligence and other innovative approaches have been gaining ground. Human-computer interactions for gesture is currently a very dynamic field, and applications to recognition of sign languages are increasing. The use of artificial intelligence is theoretically more objective, efficient and precise than data handling by (human) researchers. In the Philippines, pioneering research by De La Salle University, and more recently, the University of the Philippines, shows potential for interdisciplinary collaboration (Cabalfin & Martínez, 2008; Sandjaja, 2008; Cabalfin, in progress; Sarmiento, in progress; Pamparo, in progress). These may prove to be very useful in the automatic analysis of the extensive field data collected by the PFD and shall address the challenges of phonological analysis and historical reconstruction in the years to come (Martínez & Cabalfin, 2008).

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