# Taiwan Sign Language Research: An Historical Overview[*]

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This paper briefly summarizes the history of research on Taiwan Sign Language (TSL). After describing what is known about the origins of TSL itself, it notes that research on TSL began quite late, with the first known article concerning TSL not appearing until the late 1950s (Li 1959). Throughout the 1960s and early 1970s, collections of "Chinese Sign Language" and Signed Mandarin signs were prepared at schools for the deaf in various parts of Taiwan. The author's own research on TSL began in the mid-1970s with sign collecting and cataloguing, and progressed on through a number of linguistics papers on TSL non-manual signals, word order, compound formation, phonetics and phonology, and eyebrow raising. The first dissertation to be written on TSL was Smith 1989. By then other researchers had begun to look seriously at TSL, and the National Association of the Deaf of the Republic of China had sponsored two TSL textbooks (Smith & Ting 1979, 1984). In the late 1990s, the author participated in the Taipei City Government's project to develop TSL training materials for sign language interpreters. More recently a number of linguists have joined forces to examine TSL in depth, resulting in projects such as the publication of this special issue of *Language and Linguistics*. Suggestions for future work include studies of TSL discourse, the production of a comprehensive dictionary of TSL, the preparation of instructional materials at a more advanced level, and research into Deaf history in Taiwan: if those who know this history do not pass it on to the younger generation, it will be lost forever.

Key words: sign language, Taiwan Sign Language (TSL), history of linguistics, dictionaries, Deaf history

## 1. Early history of Taiwan Sign Language

Taiwan Sign Language (TSL) is the language used by approximately 30,000 deaf persons residing on the island of Taiwan. It bears a striking similarity of lexicon to the

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[*] Editor's note: Given the rapid pace of TSL research today, it is impossible to prepare a review that can fully keep up. This is, of course, a very good thing. Readers interested in the very latest research on TSL can find it in masters theses, doctoral dissertations, journal articles, and books available in university libraries across Taiwan and around the world.

sign languages of Japan and Korea, yet over the last 50 years it has acquired lexical items from the sign languages of the Chinese mainland and Hong Kong, and more recently it has adopted a large number of signs that were invented for educational purposes. It is a language unrelated to and independent from the predominant spoken languages of the island—Mandarin, Southern Min ("Taiwanese"), and Hakka—as is demonstrated by the numerous structural differences between it and these three spoken languages.

TSL can be divided into two varieties, one centering on Tainan in the south, where the first school for the deaf in Taiwan was established in 1915, and the other in the Taipei area, where Taiwan's second school was established in 1917. Both of these schools were founded during the Japanese occupation of the island (1895-1945) and there was little communication between them until after World War II, when they both came under the jurisdiction of the provincial government of Taiwan. This helps explain both the affinity of TSL to the sign languages of Japan and Korea (also occupied by Japan, 1910-1945), and the reason for the dialectal differences.

Little is known about what kind of sign language might have existed in Taiwan prior to the Japanese occupation. Remnants of earlier languages may have survived in TSL place names, a phenomenon attested in languages from around the world. One possible survival from this earlier sign language may be the Tainan sign for their own city, TAINAN: The sign appears to be a combination of the signs TAIWAN and PLACE. Originally, the name *Taiwan* referred only to the environs of the present-day city of Tainan, which literally means 'Tai(wan)-south'. The name of the city was changed to *Tainan* in the 1800s, before the start of the Japanese occupation, so the sign may be a holdover from the signs of pre-occupation Taiwan. Another possible holdover from this period is the sign KAOHSIUNG, a blend of the signs for 'dog' and 'harbor'. Until the Japanese era, the city was known as *Dakau* ('strike the dog').[1] When the Japanese took over Taiwan, they retained the general pronunciation of the name (*Takao*), but rewrote it with two different Japanese characters, which are now read in Mandarin as [kau̯˩.ɕi̯oŋ˧˥] (*Kaohsiung ~ Gāoxióng*).

During the Japanese occupation of Taiwan, schools for the deaf were established or restructured so as to include deaf students in Tainan and Taipei in 1915 and 1917 respectively. Soon, teachers were invited to come from Japan and teach in the schools in Taiwan. The teachers brought with them whatever signs they had used in Japan. Many of the teachers at the Taipei school came from the Tokyo area, while many of those at the Tainan school came from Osaka, thereby carrying over some of the dialectical differences within JSL into Taiwan. During the occupation, then, the signs used in

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[1] A Taiwanese folk-etymology of an even earlier name; cf. Southern Min *tak* 'to gore', *káo* 'dog'.

Taiwan were essentially the same as those used in Japan.

In 1945, Taiwan was turned over to the Republic of China, and instruction in Mandarin began. The Japanese teachers at both schools for the deaf in Taiwan were sent back to Japan, and possibly the sign language they had used in instruction would have been taken back with them, had it not been for the fact that both schools had at least one Taiwanese teacher who had taught at the school during the occupation and who continued teaching there under the new administration. In Taipei, Lin Wensheng, a deaf man educated in Tokyo, became the new principal of the school and passed on Taipei's Tokyo signs to a new flock of Chinese teachers. In Tainan, Chen Tiantian started training teachers in the Osaka signs that his school had been using.

Later, in 1949, an influx of refugees poured into Taiwan from the mainland in the wake of the communist takeover of China. The group included several deaf people and former teachers at the Nanjing and Shanghai schools for the deaf. Wang Zhenyin, a deaf man from Nantong, Jiangsu, was hired to work at the Taipei school around 1948. He may have been significant in introducing some Mainland Chinese signs to the school for the first time. Wang introduced, among other things, the system of fingerspelling used at the Nanjing School for the deaf, although his untimely death on November 28, 1956, prevented continued use of the system for more than a few years.

Some Chinese Sign Language (CSL) signs may also have been introduced into TSL by graduates of the Private Chiying Elementary School for the Deaf and Mute in Kaohsiung which originally used a dialect of CSL. The deaf principal of the school, Jiang Sinong, brought his own Nantong dialect of CSL with him to Taiwan and established his school there in the 1950s. When students from his school graduated and proceeded on to secondary school at any of the three public schools for the deaf in Taiwan, they first had to learn a new sign language before they could proceed with their studies. This school was later heavily influenced by TSL when deaf graduates of the three public schools went to his school to teach.

Another deaf teacher from the Mainland, Fang Bingmei, a graduate of the Nanjing School for the Blind and Mute, was originally sent to work at the Tainan school but later transferred up to the Taipei school where he had considerable influence in replacing old Japanese signs with signs from CSL. Other CSL signs were gradually introduced into TSL by deaf visitors from Hong Kong and by deaf students from Hong Kong who came to study high school in Taiwan. Still other new signs were invented as the need arose in instructing students in the Mandarin language. Thirty years of separation have now resulted in numerous differences between TSL, JSL, and CSL, but the basic relationship among them still holds.

## 2. Research on Taiwan Sign Language

**2.1**     TSL remained an unrecorded language until 1959 when Li Minghuang (1959) prepared an unillustrated, written translation of a collection of Osaka signs into Chinese and prefaced it with the statement that the signs in the collection were also in general use in Taiwan, primarily at the Tainan School for the Deaf in the south, but also partially at the Taipei School. He noted that the signs at the two schools were gradually blending together and hoped to work towards the unification of the signs in Taiwan.

**2.2**     In the early 1960s, other attempts were made to collect TSL signs into book form. To improve the quality of teaching at the Taipei school, the director of teaching affairs, Mr. Lü Hankui, began promoting sign language research and holding sign language classes for the teachers. Teachers from all three schools for the deaf made a tremendous effort to collect existing signs and create new signs for those Chinese words which had no corresponding signs. A total of eight volumes of signs were collected and photographed, but the project remained largely unfinished, and the original eight volumes of photographs may be missing. (Fortunately, I had already photocopied them.) Only three of the eight volumes were ever published, in the form of a small book put out by the Taipei School in May of 1963 (Taiwan Provincial Taipei School for the Blind and Deaf 1963). It contained photographs and written descriptions of about 200 signs but was not clearly printed, lacked a lot of common words, had no index, and was not widely circulated, causing it to be generally ignored by both teachers and students.

**2.3**     Seven years later, Chen Fengwen (1970), a teacher at the (then) Fengyuan School for the Deaf, published another small book of signs, focusing primarily on those used at the schools in the south. He followed the model of some Japanese Sign Language booklets that had been recently published and made a pioneering attempt to group the signs into various categories according to their form and usage. Although it was well organized, his drawings were not clear enough to allow the average reader to be able to reproduce the signs accurately.

**2.4**     Lin Baogui (Lin 1975) compared the education of the deaf in the United States, Japan, and the Republic of China, and dealt briefly with the word order of Japanese Sign Language (JSL) and TSL, making a pictorial comparison of selected signs between these two and also American Sign Language.

**2.5**     Li Junyu (Li 1976) made a much more detailed analysis of TSL as part of his study on the various communication methods in use at the schools for the deaf in Taiwan. He categorized TSL signs into five groups, similar to the categories used in classi-

fying Chinese characters: imitative, symbolic, associative, borrowed, and miscellaneous. He went on to comment on different types of handshapes and movements to be found in TSL signs.

**2.6**    My own research into Taiwan Sign Language began with an informal paper (Smith 1976a) in which I attempted to put into words what I had learned about Taiwan Sign Language over the previous two to three years. In comparing TSL with other sign languages, I found that TSL and JSL have a common vocabulary of about 46%, including such signs as: MALE, FEMALE, FRIEND, MORNING, NOON, NIGHT, PAST, FUTURE, YESTERDAY, TOMORROW, HAVE, THINK, REMEMBER, FORGET, FAR, and NEAR. By contrast, TSL and American Sign Language only displayed about 10 to 15% common vocabulary, including the signs: STOP, BATHE, BREAK, DRIVE, OPEN, EAT, RAIN, MEDICINE, MACHINE, and RED. TSL and (mainland) Chinese Sign Language had about 20% of their signs in common, including: COLD, FEW, HOUSE, LITTLE, MOON, PERSON, SCHOOL, THANK-YOU, and the numbers ONE, TWO, FOUR, and FIVE. Similarly, TSL and Hong Kong Sign Language also shared about 20% of their vocabulary, including the signs: ALL, FLOWER, HORSE, RED, SELF, SUN, TRAVEL, WORK, the numbers ONE, TWO, THREE, FOUR, and FIVE, and the days of the week.

In Smith (1976a), I also made a preliminary classification of TSL signs into thirteen groups. (1) Indexing or pointing directly to the referent [EAR, NOSE, HE/SHE, including when the signer pointed to his palm after having written out a Chinese character in his palm in order to refer to that character again]. (2) Signs relating to the shape of whole or part of the referent [BALL, JAPAN, DUCK, HOUSE]. (3) Signs associated with certain characteristics [MORNING, COFFEE]. (4) Abstract signs [LAW, ACADEMIC-RECORD, CUSTOM]. (5) Signs for actions [RUN, CHOP, REMEMBER, LOVE]. (6) Place-name signs, both unique [TAIWAN, HSIMENTING] and borrowed [CANADA, HSINCHU]). (7) Personal-name signs, with thumb or pinky extended to indicate whether the name belonged to a male or a female. (8) Character signs [NORTH, KING, MIDDLE, GO-IN-PERSON]. (9) Mime and gestural signs (used to give directions and in retelling a story). (10) Foreign borrowings [WC, BEER, UNITED-STATES]. (11) Slang and euphemisms [CLUELESS, MIXED-UP, PIG=SLEEP, PREGNANT]. (12) Signs that reflect the surrounding majority culture [NOODLES, BUDDHA, OLDER-BROTHER, YOUNGER-BROTHER]. (13) Compounds and blends [SOY-SAUCE (=BLACK+POUR), KAOHSIUNG (=DOG+HARBOR)].

I wrote also about dialects and variation within TSL, noting that there were two clear dialects, north (Taipei) and south (Tainan and Fengyuan/Taichung). As an example of these north-south differences, I considered the sentence "*I don't know the*

*teacher's name*.", wherein the signs NOT-KNOW, TEACHER, and NAME are different between north and south. I pointed out that many of these dialectal differences represented ancient Tokyo vs. Osaka differences [ABLE, TAINAN, MONDAY]. I noted that Chinese Sign Language influenced Taipei much more than it did Tainan [GERMANY, THANK-YOU], and also pointed out occasional differences in the meaning of the same sign: Tainan LIKE = Taipei WANT; Tainan WANT = Taipei USE; Tainan USE = Taipei BUY.

In terms of phonetics and phonology in TSL, I made very preliminary suggestions as to the types of handshapes and locations that TSL displayed. In terms of morphology, I pointed out examples of directionality on verbs [TELL, ASK, HELP, INVITE]; the use of what I then termed the "dummy object", which I later (Smith 1989) referred to as a gender marker. Borrowing a term from Fred C. C. Peng of the International Christian University of Tokyo, I commented on the process of "reversibility", wherein a change in the direction of a sign creates the opposite meaning: [NEW vs. OLD (used), OLD vs. YOUNG, BUY vs. SELL]. I spoke of "fusion", or the combination of two signs into a blend [HOW-MUCH-MONEY, KAOHSIUNG, PARASITE], made a distinction between "reduplication", which involved a meaning change [NORTH vs. TAIPEI, WEN(cs) vs. COMPOSITION, HOUSE vs. BUILDING], and "repetition", which involved no such meaning change [NAME, GOOD]. Finally, I gave examples of negative incorporation [NOT-LIKE, NOT-ENOUGH].

In the area of syntax, I: (1) made reference to "simultaneity", or two signs articulated at the same time [You//know?, money//tongue-wiggle];

a. _____^^__          "Do you know?"
   YOU-wh
   KNOW-sh


b. _____neg____     "(I) don't have any money."
   (tongue-wiggling)
   MONEY


(2) discussed the postposition of negatives [MONEY NOT-HAVE, I BELIEVE NOT-HAVE] and "auxiliaries" (later called modals) [HE RUN LIKE, I BUY WANT]; (3) countered the claims of both Lin (1975) and Li (1976) that the predominant word order in TSL is SOV under influence from Japanese; (4) looked at three types of question formation [(a) using MA, (b) using question words, and (c) using raised eyebrows]; (5) examined time indicators [movement back = past; movement down = present; movement forward = future]; and finally (6) identified certain aspect markers such as FINISH.

At the end of the paper, I noted that non-manual signals could be either lexical (i.e., associated with specific signs) [WANT, 50-CENTS, FEEL, NOT-HAVE, WHAT, HAVE] or syntactic, i.e., conveying information about the structure of the sentence.

**2.7**　　Marian Kimura was an American student who took my course in TSL at California State University at Northridge in 1976. In Kimura (1976), she compared 354 TSL and JSL signs, classifying them as the <u>same</u>, <u>similar</u> (handshape or movement are slightly altered), or <u>different</u> (no significant similarities), and found that 121 signs were the same (35%), 61 signs were similar (17%), and 172 signs were different (48%). Therefore, 52% of the signs were the same or similar between TSL and JSL in the data she examined. Kimura also noted that similar/same signs frequently belonged to some semantic grouping. For example, it appeared that TSL signs for family relationships as well as time expressions tended to be similar to JSL, whereas signs related to various types of work tended to be different between TSL and JSL.

**2.8**　　Smith (1977a) was based on the analysis of two-to-three minutes of TSL conversation between two students. I made an exhaustive transcription of all facial and other body movements. Among my findings were the following.

1. The TSL questions in the data were always accompanied by raised eyebrows, regardless of question type. They were also frequently marked by signs or sign sequences like HAVE-NOT-HAVE, FINISH NOT-YET, ALREADY NOT-HAVE and were also accompanied by the non-manual signal "oo" (rounded lips).

2. Discourse regulators, used to control turn-taking, etc., included eyegaze and attention getting gestures.

3. Negation was largely a manual phenomenon, head-shaking not being common in the data. The sign NOT was rarely used, negation being primarily indicated by such negative-incorporating signs as NOT-HAVE, NOT-ABLE, NOT-WANT, ISN'T, NOT-YET, NOT-MATTER.

4. Directionality on verbs was quite evident, such as in INVITE-HIM-HERE, TEACH-YOU, TELL-ME. These verbs all made use of what I then called a "dummy object", i.e., a gender marker.

5. Time adverbials displayed predictable patterns. Adverbials referring to past time generally moved back, those referring to the present moved down, and those referring to the future moved forward. Recency was expressed with the sign JUST and by "crooking head somewhat to one side", similar to the use of the non-manual signal "cs" (cheek-to-shoulder) in ASL.

6. I analyzed the function of individual non-manual signals in TSL, including eyebrow movements, eyegaze, and mouth and lip movements.

7. I also made some preliminary observations on sign order in TSL, noting that basic sentence elements appeared to follow the following order,

subject / time / verb / adverbial / object / modal / question particle

although variations from that general pattern were also noted. Among other observations were the following: (1) subjects were frequently repeated at the end of a sentence, especially in questions; (2) time adverbials usually came first in sentences or phrases; (3) indirect objects either preceded direct objects or were incorporated into the verb before the direct object; (4) modifiers both preceded and followed their nouns; (5) verbs frequently followed each other serially; and (6) the data supported the proposition that TSL displays an underlying SVO order, except that signs with modal force appeared at the end of the sentence.

**2.9**    In the mid-1970s, the Ministry of Education called together representatives of the three schools for the deaf in another major effort to standardize and unify the signs to be used for instructional purposes throughout Taiwan. After determining a basic vocabulary of approximately 1,750 words, teachers at the three schools set to the task of unifying, or in some cases inventing, signs for words and concepts often used in teaching. The resulting work, the *Shouyu Huace* (Li 1978) was met with great enthusiasm on the part of educators, but disappointment on the part of the Deaf community, who felt that the work failed to reflect their views as to how signs should be presented, and because very few Deaf people had been even marginally involved in the work of preparation. Subsequent editions of the *Shouyu Huace* were published in 1987 and 2000 (Ministry of Education 1987, Ministry of Education, Special Education Work Group 2000a, b), and I understand that there was more Deaf involvement in these later editions.

**2.10**    During the latter years of the 1970s, my own activities in Taiwan were largely centered around promoting Deaf awareness, teaching sign language classes, helping to organize activities wherein Deaf and hearing people could get to know each other better and then together seek to improve the lot of Deaf persons in society. The events of this period are the topic of an upcoming book (Smith, in preparation). Needless to say, I was involved in a lot of public education and advocacy work and, although they were not directly related to TSL research, the following four papers were part of that activity: Smith (1977b), Smith (1978a), Smith (1978b), and Smith (1979).

**2.11**    As interest in sign language classes grew among the general public, it quickly became apparent that new teaching materials were needed for teaching the language.

The appearance of the *Shouyu Huace* made the differences between TSL and Signed Chinese painfully clear, and it was at this point that I began to devote myself completely to promoting TSL, and in making clear the distinction between it and the type of signs being promoted by the Ministry of Education. Thus began, in 1978, a two-year period during which I was involved, along with the Deaf community and the incredible assistance of Ting Lifen, in the preparation of a textbook for use by hearing learners of the language, and in which was presented an overview of the major linguistic features of the language in lay terms. The resulting book (Smith & Ting 1979) contained 752 signs and each lesson was comprised of a new vocabulary section averaging 75 items, followed by lists of compounds, practice phrases, sentences, and conversations, and also included grammatical notes and other relevant information concerning the structure of TSL. All of the proceeds of that work went to, and are still continuing to go to the Deaf Sign Language Research Association of the Republic of China, now renamed the National Association of the Deaf of the Republic of China. The National Association of the Deaf has since made a number of changes and revisions to the original 1979 version of the book.

**2.12**     By the early 1980s, TSL research conducted by Chao Chienmin culminated in his 1981 book *Natural Sign Language* (rev. ed. Chao et al. 1988), later significantly revised and published under the title *Natural Sign Language Instruction* (Chao 1999). It was a large illustrated compilation of several hundred TSL signs at the more advanced level. It was unique in that it began with a description of over fifty individual facial expressions used lexically and adverbially in TSL. It was a highly significant contribution to TSL instruction as it contained a much heavier emphasis on facial expression than any prior work had, and represents years of work by a native user of the language. Its importance cannot be overstated.

**2.13**     Smith (1981a) was the first paper dealing with Taiwan Sign Language that I wrote as part of my doctoral studies. Using a database of 515 signs, I made the following observations. I isolated 52 distinctive hand configurations and 22 unique sign locations on the body and non-dominant hand. I demonstrated that with three exceptions, TSL signs appeared to follow the same symmetry constraints proposed by Robbin Battison for ASL (Battison 1978), namely that if both the dominant and non-dominant hands moved in the articulation of a sign, then the handshapes would be identical. The three exceptions were: BUY, SELL, and MARRY. In Smith (1989) I reanalyzed these exceptions as simultaneous articulations of independent signs.

**2.14**     Smith (1981b) was a more detailed look at the function of eyebrow raising in

TSL. I noted that brow raising was used in conjunction with the following phenomena: (1) yes-no questions, (2) topicalizations, (3) affect, (4) if-clauses and appositions, (5) word stress or emphasis, and (6) to mark sentence breaks and boundaries.

**2.15** In Smith (1982a) I presented my analysis of videotaped data from two native TSL signers. I transcribed the data frame-by-frame, timing each segment, including the duration of all hold segments, movement segments, and transitions. Among my findings were:

TSL compounds regularly display semantic shift, not predictable from the source signs. For example: BODY + PROOF = ID-CARD, RELATIVE + FLOWER = OVER-SEAS-CHINESE, BROWN + STIR = COFFEE. Further, a comparison of the length of segments of signs produced in isolation vs. the duration of the same segments when produced in compounds showed that (a) the first part of a compound tends to be shorter in duration than the second part and (b) both parts are significantly shorter than their durations in isolation. All signs are shorter in duration when they are used as a member of a compound, and this generally involves the loss of segments. I also commented briefly on the non-manual signals that usually accompany individual signs and how they change during the compounding process.

**2.16** In Smith (1977a) I had argued for an underlying SVO word order in TSL, and noted that variations from this pattern were marked in that the verbs were marked by raised eyebrows. In Smith (1982b) I analyzed videotaped data from three signers plus sentences from *Shou Neng Sheng Qiao* (Smith & Ting 1979) and Chao Chienmin's *Natural Sign Language* (Chao 1981) for a total of 459 corpus sentences. I categorized each sign appearing in the data into one of the following groups:

| | |
|---|---|
| S | - subject |
| V | - verb |
| Vi | - intransitive verb |
| O | - object |
| sVo | - verb inflected for both subject and object |
| Vo | - verb inflected for object only |
| A | - adverbial |
| At | - adverbial of time |
| Am | - adverbial of manner |
| Ar | - adverbial of reason |
| Ap | - adverbial of place |
| X | - auxiliary (see discussion below) |

| N | - negative |
|---|---|
| Q | - question word |
| I | - interjection |
| ?? | - unidentifiable forms |
| Q | - lexicalized interrogative marker |

One of my most interesting conclusions was that TSL was clearly an SVO language. Of the six possible orders, only SVO, SOV, and OSV appear in the data, establishing unequivocally that TSL subjects precede their verbs. The OSV examples appeared to be topicalizations of the object, and the SOV sentences were either examples of physical manipulation of the object [CHILD BASIN DIP, METAL, DIP; CLOTHES WASH; BOOK READ] or of an auxiliary [THAT GIRL SLEEP LIKE; HE WORK LIKE, PLAY NOT-LIKE; ME GO HAVE; ME GO NOT-HAVE]. This auxiliary usage of HAVE, NOT-HAVE, etc., seemed to extend itself to their roles as independent verbs, accounting for a few of the SOV orders [HE DICTIONARY NOT-HAVE; YOU PEN HAVE-NOT-HAVE?].

Other observations from this research were that question words generally appeared in sentence final position; subjects always preceded predicate adjectives; negative signs tended to come at or near the end of sentence; and adverbials of time usually appeared early on in sentence, before the verb, whereas adverbials of duration tended to follow the verb.

**2.17**   In the early 1980s, the newly established Deaf Sign Language Research Association of the Republic of China (Zhonghua Minguo Longren Shouyu Yanjiu Hui 1983) published a strongly worded critique of the *Shouyu Huace* and accompanied it with sign-by-sign suggestions as to how to improve the presentation. I have always felt that this was one of the most important pieces of research ever conducted by the Association, and I feel that the Ministry of Education should have taken the suggestions in this work to heart.

**2.18**   Yang Jionghuang and Lu Nanzhou (Yang & Lu 1983) completely redrew the 752 signs from *Shou Neng Sheng Qiao* and gave the resulting publication the rather ostentatious title of "Standard Sign Language Handbook". Their subsequent publication (Yang & Lu 1984) was based largely on vocabulary from the *Shouyu Huace*. Although the individual signs in these two books were indeed well drawn, and their compact size made them handy to carry around, theirs was not original research.

**2.19**   Julia Limei Chen's three papers (Chen, undated, Chen 1984a, Chen 1984b),

dating from her graduate study at Fu Jen University, represent the first attempt by a Taiwanese linguist to examine the features of Taiwan Sign Language, and for this she must be acknowledged. In the Syntactic Analysis paper (Chen, undated), she based her research on the data contained in *Shou Neng Sheng Qiao* and on the article by Li Junyu (1976), but came to very different conclusions about TSL word order, claiming that it had an underlying SOV order. She noted that "auxiliaries" generally came at the end of sentences, as did negative auxiliaries, pointed out four types of questions, and spoke of a number of verbal constructions (transitive, intransitive, ditransitive, serial verbs, and the copula).

Chen (1984a) reviewed the phonological material presented in *Shou Neng Sheng Qiao* and compared it to Stokoe's writings on ASL phonology (e.g., Stokoe, Casterline, & Croneberg 1965). In her comparison of sign language and spoken language, she reviewed the arguments for what should be considered the consonants and vowels of sign languages and rejected Liddell's view of movement (M) segments corresponding to vowels and hold segments corresponding to consonants (as expressed later in e.g., Liddell & Johnson 1989), saying "in any one language, vowels are generally much fewer in number than consonants… (but) according to this analysis, the vowels of this sign language are by far more numerous than its consonants, since segments with M are far more numerous than segments without M."

In Chen (1984b), Julia analyzes the signs of the *Shouyu Huace* and first divides them into ten types of signs, echoing the categorization system made by Li (1976): modeling the shape, representing the sound symbol, imitating the actual action pattern, expressing the feeling, imitating the way we use to make the objects, pointing, utilizing the most typical or famous characteristic, expressing the contrastive quality or quantity, symbolizing the meaning, and representing the shape of a character. She then goes on to point out some of the "Defects of Sign Language", including having only one sign corresponding to several different phrases in Mandarin, causing problems for Deaf students attempting to write in Mandarin.

**2.20**    After four years of using *Shou Neng Sheng Qiao*, the teachers and myself all felt that it was time to produce a second level textbook and thanks again to the untiring work of Ting Lifen, Volume II was completed in 1984 (Smith & Ting 1984). An effort was made to include many new signs along with compound signs, and practice materials consisting of paired presentations of Mandarin sentences with TSL translations. Rather than attempting to put together long grammatical explanations of grammar at this level, we opted rather to include a number of articles about deafness, Deaf culture, and Deaf rights, including information about interpreter services available in other countries. There were about 600 new signs in Volume II.

**2.21**    In Smith (1987a), an entry in the *Gallaudet Encyclopedia of Deafness and Deaf People*, I reviewed the basic findings to date about word order, directionality on verbs, compounds, movements and holds, handshapes, and character signs in Taiwan Sign Language, and commented that TSL had no fingerspelling.

**2.22**    Smith (1990), my first in a scholarly journal, was actually written between 1987 and 1988. It was a summary of the arguments put forth in Smith (1989) about the existence of auxiliary verbs in TSL.

**2.23**    In my doctoral dissertation (Smith 1989) I investigated several morphological characteristics of verbs in Taiwan Sign Language. I worked within the framework of autosegmental phonology and the autosegmental sign language transcription system that had recently been developed for ASL by Liddell and Johnson at Gallaudet University.

The morphological analysis of a large number of TSL verbs and verb-like forms led to the delineation of three major categories of verbs in TSL: non-agreement verbs, agreement verbs, and spatial-locative predicates. These three categories are distinguished on the basis of their ability to use space meaningfully. Agreement verbs use space to indicate subject/object agreement. Spatial-locative predicates use it to describe the location or movement of people and objects in the abstract world. Non-agreement verbs differ from the other two categories in that they do not use space in a meaningful way. Research on other sign languages has pointed up essentially the same three categories of verbs, so the use of these three types of verbs is apparently very widespread. TSL is unusual, however, in that it occasionally allows the production of two verbs at the same time, something totally impossible in a spoken language, and undocumented in other sign languages.

Agreement verbs, and occasionally non-agreement verbs, may undergo a morphophonemic process by which they may incorporate gender or number affixes into their morphology. Research to date has shown no evidence for similar gender/number affixes in ASL or any other sign language.

TSL also contains three auxiliary verbs that carry subject and/or object agreement information whenever the main verb cannot do so. Each of these auxiliaries has a reciprocal form, and each may also participate in the same morphophonemic process that incorporates gender and number affixes into verbs. This again is remarkable in that ASL and other sign languages do not display such an ability.

The gender and number affixes, as well as the auxiliary verbs, provide evidence for an active process of grammaticization in TSL. The gender and number affixes find their ultimate source in TSL nouns and numerals. Two of the auxiliary verbs have their source in TSL agreement verbs, and the third may stem from the concatenation of two

personal pronouns.

The study pointed up a large number of linguistic features associated with the verbal system in TSL. Some are easily found in other languages, both signed and spoken, yet others so far seem to be unique to TSL. A major finding of the research was to point out that sign languages may differ as much from each other as they do from spoken languages.

**2.24**    Chang Hsueho (1993) reexamined the report prepared by Ku Yushan and others from the Deaf Sign Language Research Association back in 1983 (Zhonghua Minguo Longren Shouyu Yanjiu Hui 1983) and summarized the findings. Some interesting statistics from her report include:

| | |
|---|---|
| Total number of signs in *Shouyu Huace*: | 1,766 |
| Total number of signs in *Shou Neng Sheng Qiao*: | 752 |
| Number of signs in common between the two: | 275 |
| Different signs in *Shouyu Huace* that committee accepted: | 84 |
| Different signs in *Shouyu Huace* that committee rejected: | 175 |
| Different signs in *Shouyu Huace* where committee was split: | 9 |

Chang also pointed out that the *Shouyu Huace* was character-based, whereas *Shou Neng Sheng Qiao* was meaning-based.

**2.25**    Beginning in the 1990s, a concentrated effort was undertaken by a number of different groups to provide training to those individuals who desired to become sign language interpreters, for which there was and still is a pressing need. The National Association of the Deaf of the Republic of China (Zhonghua Minguo Longren Xiehui 1994) compiled a book of student reflections at the end of one of these six-month interpreter training sessions, and its opening words, entitled "Rescue our Mother Language— Natural Sign Language", were written by Ku Yushan, the president of the association. Ku called for the recognition of "natural sign language" (i.e., TSL) as the native language of the Deaf population, just as other minority languages of Taiwan (Hakka, Atayal, Paiwan, etc.) have been recognized. He rightly criticized sign language publications by the ROC government put together by non-native users of the language, namely hearing people, and asks why deaf people would want to use materials in whose compilation they were not allowed to participate.

**2.26**    Beginning in 1997, Chao Yuping began publishing a series of four sign language textbooks (Chao 1997a, b, c, 1999), which are remarkable in that they are the

result of the efforts of an editing team headed up by a Deaf individual. Chao himself has bridged the hearing and Deaf worlds in that he has served as president of the National Association of the Deaf of the Republic of China and has also worked with hearing people in the Ministry of Education to aid in the development of signs for instructional purposes. The first three books in the *Sign Language Master* series cover a large number of signs presented in line drawings and accompanied by Chinese and English translations, descriptions of the signs, cultural and grammatical information, sign language equivalents of Chinese idioms, self-testing material, and indices. The fourth volume in the series is different in that the signs are presented with actual photographs of signers describing the accompanying pictures, largely without Chinese translations. Other sections of the same volume deal with the history of sign language in general, the history of TSL in particular, TSL compound signs, TSL sentence structure, name signs, and Deaf culture.

In 1998, Chao and his team published two more sign language texts. The first (Chao 1998a) is an admirable attempt at pairing already existing TSL signs with Chinese characters, yet being careful to distinguish between alternate meanings of characters, such as *yun* meaning "to transport" vs. the same *yun* meaning "luck". A few months later, Chao followed this up with a book designed for children (Chao 1998b) that presents basic signs accompanied by cartoon drawings suggestive of the meanings of each sign. I shall leave it for future researchers to determine how well the sign selection in this series of books tallies with current TSL usage.

**2.27** In 1998, I was invited to serve as coordinator of a TSL interpreter training program being sponsored by the Taipei City Government's Bureau of Labor Affairs. After working with Ting Lifen and a committee made up of representatives of the various associations for the deaf in the Taipei area, a series of lessons were planned and developed. These were eventually expanded upon and published in two volumes by the Bureau of Labor Affairs of the Taipei City Government under the title *Shouyu Fanyi Peixun Jiaocai* (Taipei City Government, Bureau of Labor Affairs 2001, 2002). The books were accompanied by CD-ROMs which presented the signs and conversations and also provided practice in sign-to-voice interpreting.

While in Taiwan I taught the group of prospective interpreters a two-month long course in TSL linguistics in which I presented the results of my previous research, especially my Ph.D. dissertation. I also made two presentations on TSL linguistics at Yang-Ming University that were well received (Smith 1999). I also began work on databases and symbol systems that would be used in compiling a comprehensive dictionary of TSL that would include all dialects and variations of the language, as a key resource for learners of the language, the same purpose that Stokoe's *Dictionary of American Sign*

*Language* served in the U.S. (Stokoe et al. 1965). With that goal I began the development of a Microsoft Access database that would contain phonetic information about individual signs that could then be linked to other databases with information about usage, etymology, etc.

**2.28**   Ever since Jean Ann spent five months at the Chiying School for the Deaf in Kaohsiung back in the early 1990s, she has been a prolific writer on several aspects of TSL phonetics and phonology, specifically the interaction between the physiology of the hand and the ease of production and relative frequency of specific hand configurations in TSL (Ann 1991a, b, 1992a, b, 1993, 1996a, b, 1998a, b, 2003, Ann & Peng 1994, 2000). I shall not attempt to summarize all of her research here, but it has been a significant contribution not only to the literature on TSL phonology, but to sign language phonology in general.

**2.29**   Daisuke Sasaki (Sasaki 2001) is doing the type of research that I have always wanted to do. By comparing the vocabulary and structure of three related languages—Japanese Sign Language, Taiwan Sign Language, and Korean Sign Language—he is attempting to answer such questions as the following: Do individual signs come from Japan, from China, from Hong Kong, from ASL, or from yet other sources? What are the "oldest signs" of TSL? Can we possibly reconstruct proto-forms of signs in the JSL language family by comparing JSL, KSL, and TSL? What processes are active now in the creation of new signs in TSL? How much has TSL changed over the past 50-odd years since Taiwan's retrocession to China? These and other questions are the ones that Sasaki is beginning to take up.

Some of Sasaki's preliminary work has shown that approximately 60% of a sampling of some 600 signs were either the same or similar between TSL and JSL. Delving deeper into those signs which are the same or similar, Sasaki seeks to do comparative studies that could give a more detailed account of what the proto-forms of the signs of these East Asian sign languages would be.

**2.30**   Hsing Minhua (Hsing 1993, 1994, 2001) has been conducting research on the use of TSL in instructional settings. In her doctoral dissertation (Hsing 1994) she noted the following. (1) While teaching, most instructors use a combined oral-manual Total Communication approach. (2) When teachers are unable to produce a particular sign, they used a number of remedial techniques, including (a) switching to TSL, (b) switching to the Mandarin Mouth-Hand System developed by Taipei teacher Chen Tsaiping, (c) using more facial expression, (d) writing on the blackboard, or (e) simply omitting the signs altogether. (3) More experienced teachers, when interviewed, noted that when

students failed to understand their "grammatical sign language" (Signed Chinese), they would switch over to "natural sign language" (TSL), so that the students would understand better. (4) High school students, when interviewed, were evenly divided in their preference for "grammatical sign language" vs. TSL.

Also in her dissertation, Hsing notes that pre-service training in sign language for most teachers at the schools for the deaf was virtually nil, and in many cases the deaf students ended up teaching sign language to their teachers. In a survey conducted in 1993, she discovered that only 6% of the hearing teachers were confident about their ability in sign language, whereas, on the contrary, the deaf teachers were totally at ease in their signing ability, presenting a strong contrast with the hearing teachers.

Her 2001 presentation concerned how sign language learners feel about certain aspects of their sign language classes. To quote from her abstract: "Nearly all students believed sign language courses would be beneficial for their future teaching. Most students preferred the team teaching model (one deaf teacher and one hearing teacher), followed by the deaf teacher model. Students took the course because of professional needs or interests, or both. Sign language courses should be divided into basic and advanced ones." For those students enrolled in advanced level sign language courses, Hsing notes: "Students learned how to add vivid facial expressions and body movement more confidently and fluently when they use sign language to make complete daily-life sentences than before. Besides, they understood more grammar and syntactic structure of Natural Sign Language. Students believed that sign language can be introduced to different educational settings, for example, special classes for students with hearing impairments, regular classes for hearing students, or people in the society."

**2.31**    Diana Chiu (see this volume) has been working with Professor Daisy Hung at National Yang-Ming University conducting a series of psycholinguistic and neurolinguistic studies of TSL.

**2.32**    Adam Schembri (Schembri 2002) compares polycomponential verbs of motion and location (otherwise known as "classifier predicates") in three signed languages, Auslan (Australian Sign Language), ASL, and TSL. He finds that there are important cross-linguistic differences in the use of handshape morphemes to represent referents. Uses of space and some features of movement appear, however, to be highly similar in these three unrelated signed languages. He notes points of similarity in signed language and gesture, and suggests that many of the spatial and movement features of polycomponential verbs appear to be transparently related to their meanings, rendering problematic attempts to analyze them as morphemes in the traditional sense.

**2.33**    James Tai and his colleagues at National Chung Cheng University have received a four-year grant from the National Science Council to conduct linguistic and psycholinguistic research on TSL. Specific goals include building on previous work to produce a scholarly reference grammar, a comparative grammar of TSL and Signed Chinese for research and pedagogy, and a graphic web-based dictionary of TSL. Professor Jane Tsay is focusing on the phonology, Professor James Myers is leading the research on morphology and psycholinguistics, Professors James Tai and Jung-hsing Chang are heading up the syntax portion including the lexicon, and Professor Oscal Tzyhchiang Chen is working on the development of the digital graphic dictionary. The purpose of this research is both to bring TSL to the attention of the international linguistic community, and to provide materials of practical use for the teaching of the deaf in Taiwan.

**2.34**    Hsinhsien Lee and colleagues (Lee et al. 2001) compared the hand configurations that appeared in the Ministry of Education's *Shouyu Huace* publications and the signs appearing in the two volumes of *Shou Neng Sheng Qiao*. They found no significant differences in the patterns of preferred handshapes in TSL vs. Signed Chinese. Their results showed that although Signed Chinese is an artificial sign system, it still conforms to physiological constraints on hand configuration. This implies that pedagogical sign creators will tend to use signs that are easier to articulate, just as natural signers have done. The results suggest that what differs between SC and TSL does not lie in handshape alone. After all, the articulation of handshapes is in a large part constrained by physiology. More research into the phonological differences between TSL and SC is required for a deeper understanding of the natures of these two systems.

## 3. Suggestions for future research

Although much research has already been conducted on Taiwan Sign Language, much more research still needs to be done in order to fully understand the complex mechanisms by which Deaf people in Taiwan convey their thoughts fluidly and naturally in their native language. Among the many remaining areas of research are the following.

### 3.1 Phonological research

Further study is needed of TSL hand configurations, locations, movement patterns, orientation issues, timing of segments, non-manual signals accompanying specific signs, one- vs. two-handed signs, and so forth. There is a pressing need to develop a usable

notational system for TSL. There have been those who have claimed that there is no writing system for sign languages. This is simply not true. Sign languages around the world have been successfully and faithfully recorded by means of the SignWriting notation originally developed in the United States by Valerie Sutton (www.signwriting.org). Not only is the system useful in the making of dictionaries, such as the impressive trilingual LIBRAS-Portuguese-English dictionary published recently in Brazil (LIBRAS is the official name of Brazilian Sign Language), but it can also be used in writing textbooks completely in sign language, and has been used in this way by schools for the deaf in Nicaragua and Germany.

## 3.2 Morphological and syntactic research

Far and beyond the need to understand basic TSL word order (which I still maintain to be SVO despite claims to the contrary by novice researchers in Taiwan), much research needs to be done to understand the complexities of TSL morphology, which I believe is key to the understanding of the inner workings of the language. This includes research into negation and negative incorporation, verb/noun pairs, question words, auxiliaries, and such non-manual signals as brow raising, eye gaze, body shifts, head movements, etc.

## 3.3 TSL at the discourse level

No language can be studied at the level of the individual sentence. An understanding of context and anaphora are critical to understanding the meaning of TSL utterances. Among specific areas of research might be eyeblinks, turn-taking, correction devices, feedback mechanisms, pronoun reference, etc. Groundbreaking research into the nature of gesture (in its specifically linguistic sense) in TSL has been begun by Susan Duncan, and this needs to be followed up by the analysis of TSL discourse in natural settings in order to get an accurate picture of how gesture is superimposed upon the utterances of the language.

## 3.4 Comprehensive dictionary of TSL

No language is considered a language until a comprehensive dictionary is produced that pulls together the richness of its vocabulary. One needs to look no further than Stokoe's groundbreaking 1965 *Dictionary of American Sign Language* to see the impact that a dictionary can have on the acceptance of a language. The ideal dictionary of TSL would contain a vast number of signs and variant forms of signs culled from all

dialects of the language, and would include etymological information, comparisons with other sign languages, examples of usage, faithful translations into Chinese and/or English, a description of the production of the sign, clear indications as to handshape, location, movement, orientation, and any accompanying non-manual signals. To produce such a dictionary, there is a strong need for dialect research and data collection, such as is being proposed by Huteson, Hurlbut, and Chou (in progress).

## 3.5 Research into other sign languages

Whatever happened to Kaohsiung Sign Language? When I visited the Chiying School back in the late 1970s, I discovered a language that was very much distinct from the TSL that I had been learning, and I took numerous notes of the signs being used by the students there. By the time Jean Ann arrived at the school in the early 1990s, the school had apparently switched over to TSL. So what happened in the 1980s? I feel that research needs to be done to see what we can reconstruct of that earlier language, including comparisons between it and the sign language of the Nantong area near Shanghai where the former principal Jiang Sinong came from to see how much resemblance there actually was.

Also, and perhaps more urgently, researchers should be sent to the village of Minjian, which has a inordinately large population of Deaf women married to hearing spouses in a effort to determine what kind of communication they are using. Research into such sign language isolates, which include Rennelese Sign Language in the Pacific and Providence Island Sign Language off the northern coast of Colombia, have greatly enhanced our knowledge of sign language development.

## 3.6 Sign language development

All languages can grow, and wise leaders within the Deaf community can help TSL grow to better meet the needs of an ever-changing world. Deaf researchers should gather together to collect signs for technical terms in such fields as medicine, law, religion, science, sex, art, and social work, and the results of this work should be disseminated appropriately. Research into the TSL number system needs to be done in order to accurately describe the expression of mathematical functions, fractions, time concepts, monetary divisions, and the like. TSL place names need to be codified for the teaching of geography, and could be published in the form of a TSL atlas. Other targets of investigation could be studies into TSL airwriting (*kongshu*), palmwriting (*zhangshu*), character signs, name signs, and so forth.

## 3.7 Preparation of instructional materials

There is still a great need to prepare more TSL textbooks and teaching materials, videos, CDs, books, etc., especially at the advanced levels. Work should also begin towards the establishment of a TSL teacher testing and certification program. More Deaf people need to be trained in TSL linguistics; there is nothing more valuable than a well-trained native researcher. Finally, there is a need to establish a TSL research website to help people worldwide stay in touch and publish their findings online.

## 3.8 Research into Deaf history

Over the next few years I personally hope to be able to revisit a book (Smith, in preparation) that I began writing in 1980. The book is a historical overview of the development of educational programs for the Deaf in the Republic of China, from the mid-1800s to 1980, when I collected the material, with perhaps a brief chapter chronicling the major events from 1980 to the present. In compiling this work, I have called upon both Chinese and English language sources.

The first chapter deals with the history of deaf education in mainland China from the beginnings to 1949. Chapter two treats the development of deaf education in Taiwan from the beginnings to 1945. Chapter three covers events in the period from 1949 to 1980, and chapter four is a report on the status of deaf education in Taiwan as of 1980. Another very important part of the history, which very much needs to be told, is what has happened within the Deaf community itself, outside of the school setting. This brings me to an important point.

I strongly encourage Deaf people themselves to take up the task of recording their own history and making it available to the younger generation of Deaf people in Taiwan. The members of every cultural and ethnic group need to be taught their own history, and learn to respect, love, and be proud of their own culture. If I were to poll a group of students at any of the public schools for the deaf in Taiwan, I wonder how many of them could tell me who Lin Wensheng was? If those of you who know who he was do not pass on this information to the younger generation, it will be lost forever.

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# 台灣手語研究之歷史概況

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　　本文概述了關於台灣手語研究的歷史。在描述了關於台灣手語的起源以後，本文注意到台灣手語的研究起步相當晚，第一篇關於台灣手語研究的文章到 1950 年代後期才產生 (Li 1959)。從 1960 年到 1970 年代初期，在台灣各地的聾人學校皆備有"中國手語"和"文法手語"的典籍。本文作者在 1970 年代中期開始進行台灣手語詞彙的收集和分類，並撰寫有關台灣手語之非手勢符號、詞序、複合詞、語音和音韻、及揚眉等語言學相關的文章。作者的學術論文 (Smith 1989) 是第一本關於台灣手語研究的博士論文。從那時起，其他研究者開始重視台灣手語，中華民國聾人協會並出版了兩本台灣手語的教科書 (Smith and Ting 1979, 1984)。在 1990 年代後期，作者參加台北市政府所策劃之手語翻譯人員培訓教材的專案計畫。近年來，一些語言學家傾力深入探討台灣手語，《語言暨語言學》期刊有關台灣手語專刊的出版即是其中的一項成果。本文對於未來研究工作的建議包括研究台灣手語的篇章，製作一本全面性的台灣手語字典，籌劃更具深度的教材，以及研究台灣聾人的歷史。如果瞭解這個歷史的人不將其傳遞給年輕的一代，那麼它將永遠消失。

關鍵詞：手語，台灣手語，語言學的歷史，字典，聾人文化史