

Bilingual-bimodal Acquisition of Spatial Referencing in Cantonese and Hong Kong Sign Language Narratives



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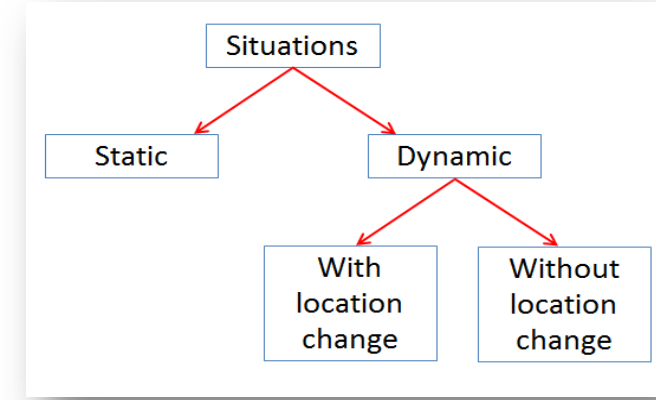
1. Purpose of this poster presentation

- Spatial referencing refers to the knowledge of using appropriate linguistic means to refer to "locations" in discourse. Spatial referencing requires organizing the flow of spatial information in discourse and more generally relating utterances to their contexts of use (Hickmann 2003).
- This research project aims at investigating the **acquisition of spatial referencing in Cantonese and Hong Kong Sign Language (HKSL) narratives** by the Deaf/hard of hearing (D/HH) children studying in a **sign bilingual co-enrollment program** in Hong Kong.

2. Background

2.1 Basic types of situations in which entities are spatially related

- Talmy (1975, 1983, 1985, 2000): Spatial reference involves a basic schema defined by Figure and Ground. Figure is the entity about which motion and/or location is predicated and Ground refers to the entity to which the figure is related.



- (a) **Static situation:** The predicate does not involve any motion of the figure.

Cantonese example:

HKSL example: There are three baby mice in a basket.

有	三隻老鼠BB	喺	個籃	入面
jau5	samm1zek3	hai2	go3 laam2	jap6min6
	lou5syu2BB			
Have	three baby mice	locate	the basket	inside
Existential-marker	FigureNP	Coverb	GroundNP	Localizer



FigureNP GroundCL + FigureCL

- (b) **Dynamic situation without a location change:** The predicate involves some displacement of the figure in relation to the ground, but does not overtly indicate a change in location.

Cantonese example:

兔仔	喺	草地	上	跳
tou3zai2	hai2	cou2dei6	soeng6	tiu3
Rabbit	locate	grass	top	jump
FigureNP	Coverb	GroundNP	Localizer	MannerVerb



- (c) **Dynamic situation with a change of location:** The predicate describes a motion of the figure which results in a change of its location.

Cantonese example:

HKSL example: (Mother mouse) jumps off the table.

(老鼠媽媽)	喺	上面	跳	落嚟
(lou5syu2	hai2	toi2	soeng6	tiu3
maa1maa1)		min6		lok6 lei6
(Mouse	locate	table	top	jump
mother)				down
Coverb	GroundNP	Localizer	MannerVerb	PathVerb



2.2 Packing of information of motion events - three typological types

- Talmy (1985, 2000) proposes a two-way typology to classify languages according to how the elements of Path, Manner, Motion and Cause are conflated with Figure and Ground in a motion event.
 - Satellite-framed languages:** The Manner and Motion are expressed in the main verb root while other information such as Path can be encoded by devices such as prepositions / postpositions and adverbials.
 - English: My sister rushed into the kitchen from the living room.
 - (rush: Motion + Manner; into: Path)
 - Verb-framed languages:** The main verb conflates Motion and Path. Manner is optionally expressed as an adverbial or gerundive constituent.
 - French: Le bébé enter dans la cuisine en marchant / courant / rampant.
 - 'The baby enters in the kitchen by walking / running / crawling.' Hickmann 2003:71)
- Slobin & Hoitin (1994), Slobin (2004): propose "complex verb-framed/equipollently-framed languages" as the third type to cover languages where both Manner and Path are expressed as main verbs. Examples include Chinese (both Manner and Path are expressed as main verbs) and American Sign Language (Path is obligatorily encoded as a main verb and Manner can be optionally encoded as a verb sequentially before a path verb, or an affix simultaneously incorporating into a path verb).

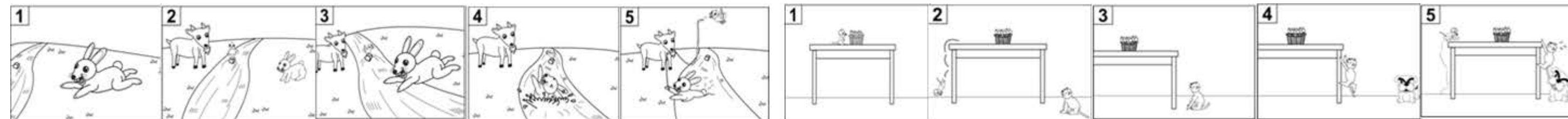
3. Research Questions & Methodology

3.1 Research questions

- Are Hong Kong Sign Language and Cantonese, a Chinese language widely spoken in Hong Kong, typologically similar in the expressions of spatial information?
- How do Deaf/hard of hearing children who are exposed to both languages in an education setting acquire spatial referencing in these two languages?
- Previous studies suggest that complex morphology may hinder the acquisition of spatial devices. Given that HKSL, as in other sign languages, requires the manipulation of the signing space when expressing spatial information, would it pose a bigger acquisition hurdle to Deaf/hard of hearing children?

3.2 Methodology

Fifteen Deaf/hard of hearing children participated in a story-telling task. The two stories are adapted from the Horse Story and Cat Story of Hickmann (2003). Four native Deaf signers and six native Cantonese speakers provide the baseline data.



The fifteen children are assigned to four levels of spoken and sign language proficiency.

	Spoken language proficiency (Expressive Language Scale of the Cantonese version of <i>The Reynell Developmental Language Scales</i>)	Sign language proficiency (Judgement by three native signers basing on content, lexical choice, word order, non-manuals and use of space)
Level 4 (Highest)	5	3
Level 3	4	5
Level 2	4	4
Level 1 (Lowest)	2	3

Table 1: Proficiency levels of the 15 Deaf/hard of hearing children

4. Findings

4.1 Adult Cantonese and adult HKSL

4.1.1 Types of Situations in narratives

Situations	Adult Cantonese data (12 stories)		Adult HKSL data (8 stories)	
	No. of token N _c =79	No. of tokens per story	No. of token N _{HKSL} =144	No. of tokens per story
Dynamic (without any spatial information)	1 (1.3%)	0.08	2 (1.4%)	0.25
Dynamic (change of location indicated)	37 (46.8%)	3.08	92 (63.9%)	11.5
Static (location indicated)	41 (51.9%)	3.42	50 (34.7%)	6.25

Table 2: Different situation types in adult Cantonese and adult HKSL data

- Among the adult Cantonese and HKSL data, there are only a few tokens of dynamic situations without any spatial information. Location or change of locations is encoded in most of the adult speech and sign data.
- HKSL provides more details than Cantonese does on motions and locations. The predominance of spatial information in HKSL discourse is mainly attributed to a high frequency of dynamic situations with a change of location.

4.1.2 Elements conflated in static and dynamic situations in adult Cantonese and HKSL narratives

- All of the static situations in the two sets of adult data contain spatial information (i.e., overt mention of Ground, localizers or spatial anchoring).
- One major difference between HKSL and Cantonese is that Path (signaled by classifier constructions) in HKSL can express spatial information, hence Ground is not always needed.
- Note that in both languages, Path is present in nearly all dynamic situations (97.4% in Cantonese, 97.9% in HKSL), whereas Manner is expressed less than half of the time (47.4% in Cantonese, 40.4% in HKSL). This provides preliminary evidence that both languages belong to "complex verb-framed languages" where Path is obligatorily encoded as verbs with Manner only optionally expressed.

Combinations	Adult Cantonese (all contain localizers)	Adult HKSL (all are spatially anchored)
Figure	1 (2.5%)	12 (24%)
Figure + Manner	0 (0%)	1 (2%)
Ground + Figure	36 (90%)	29 (58%)
Ground + Figure + Manner	3 (7.5%)	9 (18%)
Total:	40 (100%)	50 (100%)

Table 3: Elements encoded in static situations in adult Cantonese and HKSL

Combinations	Adult Cantonese	Adult HKSL
Figure + Path	0 (0%)	22 (23.4%)
Figure + Manner	1 (2.6%)	2 (2.1%)
Figure + Path + Manner	1 (2.6%)	15 (16%)
Ground + Figure + Path	20 (52.6%)	34 (36.2%)
Ground + Figure + Path + Manner	16 (42.1%)	21 (22.3%)
Total:	38 (100%)	94 (100%)

Table 4: Elements encoded in dynamic situations in adult Cantonese and HKSL

- This provides preliminary evidence that both languages belong to "complex verb-framed languages" where Path is obligatorily encoded as verbs with Manner only optionally expressed.

4.2 Acquisition of Cantonese and HKSL by the 15 Deaf/hard of hearing children

4.2.1 Types of Situations

- Dynamic situations (with no spatial information), which are almost non-existent in adult Cantonese and HKSL, account for over 30% of the Deaf/hard of hearing children's data, suggesting that they do have difficulty expressing spatial information in dynamic situations.
- Note further that these children also proportionally express far fewer static situations than adults do in both languages (Cantonese adults - 51.9%; HKSL - 34.7%).
- As the children's Cantonese proficiency improves, there is a gradual increase of spatial marking in dynamic and static situations. Such developmental trends are much less obvious in the HKSL data.

Situation Types	Child Cantonese	Child HKSL
Dynamic (without spatial information)	46 (37.7%)	48 (33.1%)
Dynamic (change of location indicated)	46 (37.7%)	70 (48.3%)
Static (without spatial information)	1 (0.8%)	9 (6.2%)
Static (location indicated)	29 (23.8%)	18 (12.4%)
Total:	122 (100%)	145 (100%)

Table 5: Different types of situations in child Cantonese and HKSL data

Situation Types	Level 1	Level 2	Level 3	Level 4
Dynamic (without spatial information)	11 (73.3%)	18 (54.5%)	9 (28.1%)	8 (19%)
Dynamic (change of location indicated)	2 (13.3%)	9 (27.3%)	14 (43.8%)	21 (50%)
Static (without spatial information)	1 (6.7%)	0 (0%)	0 (0%)	0 (0%)
Static (location indicated)	1 (6.7%)	6 (18.2%)	9 (28.1%)	13 (31.0%)
Total:	15 (100%)	33 (100%)	32 (100%)	42 (100%)

Table 6: Frequencies of different situation types in child Cantonese data

HKSL Deaf Kids Situation Types	Level 1	Level 2	Level 3	Level 4
Dynamic (without spatial information)	7 (46.7%)	17 (48.6%)	11 (22.9%)	13 (27.7%)
Dynamic (change of location indicated)	8 (53.3%)	13 (37.1%)	26 (54.2%)	23 (48.9%)
Static (without spatial information)	0 (0%)	4 (11.4%)	2 (4.2%)	3 (6.4%)
Static (location indicated)	0 (0%)	1 (2.9%)	9 (18.8%)	8 (17%)
Total:	15 (100%)	35 (100%)	48 (100%)	47 (100%)

Table 7: Frequencies of different situation types in child HKSL data

- Hence, there is preliminary evidence that the Deaf/hard of hearing children are having more difficulty in acquiring spatial devices in HKSL.

4.2.2 Elements encoded in different situations in child Cantonese and HKSL

Elements encoded in static situations	Child Cantonese		Child HKSL	
	Static (no spatial information)	Static (location indicated)	Static (no spatial information)	Static (location indicated)
Figure NP only			3 (33.3%)	
Figure + Manner	1 (100%)		4 (44.4%)	
Figure + Localizer/Spatial Locus		5 (17.2%)		2 (11.1%)
Ground + Figure		18 (62.1%)	2 (22.2%)	13 (72.2%)
Ground + Figure + Manner		6 (20.7%)		3 (16.7%)
Total:	1 (100%)	29 (100%)	9 (100%)	18 (100%)

Table 8: Elements encoded in static situations in child Cantonese and HKSL

Elements encoded in dynamic situations	Child Cantonese		Child HKSL	
	Dynamic (no spatial information)	Dynamic (change of location indicated)	Dynamic (no spatial information)	Dynamic (change of location indicated)
Figure + Manner	30 (65.2%)		27 (56.3%)	
Ground + Figure + Manner	16 (34.8%)		3 (6.3%)	
Figure + Path		9 (19.6%)	16 (33.3%)	26 (37.1%)
Figure + Path + Manner		4 (8.7%)	1 (2.1%)	3 (4.3%)
Ground + Figure + Path		13 (28.3%)	1 (2.1%)	30 (42.9%)
Ground + Figure + Path + Manner		20 (43.5%)		11 (15.7%)
Total:	46 (100%)	46 (100%)	48 (100%)	70 (100%)

Table 9: Elements encoded in dynamic situations in child Cantonese and HKSL

- Deaf/hard of hearing children fail to indicate spatial information in dynamic situation in both Cantonese and HKSL narratives. Even when Ground is indicated, children may fail to indicate its spatial relationship with the Figure.

Cantonese example:

貓	爬	檯	貓	爬	上	張檯
maau1	paa4	toi2	maau1	paa4	soeng6	zoeng1 toi2
Cat	climb	table	Cat	climb	table	table
Figure	Manner	Ground	Target form:	Path		

(Level 3 Cantonese proficiency)

HKSL example: RABBIT HAPPY HILL RUN (Level 2 HKSL proficiency)



- Deaf/hard of hearing children also appear to have more difficulty in using Path verbs in HKSL than in Cantonese. This is because Path verbs in HKSL are usually classifier constructions that must also be anchored well in space. Initially Deaf/hard of hearing children may prefer to use lexical Path verbs that do not anchor the motion in space.

HKSL example: CAT GO-WAY (Lexical Path Verb) (Level 3 HKSL proficiency)



5. Concluding Remarks

- The Deaf/hard of hearing children's performance in representing spatial information is slightly better in Cantonese than in HKSL, even though their access to Cantonese is limited and HKSL input is adequate and visually accessible.
- Such difficulty is likely to arise from the complex spatial morphology associated with Path verbs, the simultaneous representation of Ground and Figure in classifier constructions.