Japanese Sign Language (JSL) Toponym Etiology Reveals Constraints on Positional Salience in Korean Sign Language (KSL) Toponym Formation

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1 Introduction

Korean Sign Language (KSL) presents an interesting question about toponym generation. Ji (2022) finds that KSL toponyms that index the source Korean name semantics typically favor representation of the first source morpheme; however, a certain class of KSL toponyms appear to arbitrarily index either the first or second morpheme. This indexation puzzle suggests an underlying structural or social influence on the generation of KSL toponym outputs. There has been a growing body of work examining the etymology of sign toponyms, which opens the way for quantitative investigations to unearth the etiology or motivation behind sign toponym generation. This body of work may provide insights to the KSL toponym question.

2 Social and Structural Influences on Sign Toponyms

Factors that influence the distribution of endonyms and exonyms in other sign languages such as Japanese Sign Language (JSL) may offer insight into the Ji (2022) semantic indexation question. Sign toponyms typically fall into one of two large categories: endonyms, signs independent of a spoken/written source name, or exonyms, signs that index some part of the source toponym. For example, Japanese Sign Language (JSL) represents the prefecture name *Nara* with a

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monomorphemic endonym depicting the famous *Daibutsu* 'Big Buddha' statue, while a bimorphemic exonym indexes the source Japanese name of the prefecture *Ishikawa* with the signs ISHI 石 'stone' + KAWA 川 'river' (George 2022). Endonym-favoring inventories include Tibetan Sign Language (TibetSL) (Hofer 2021), Ban Khor Sign Language (BKSL) in Thailand (Nonaka 2015), and Adamorobe Sign Language (AdaSL) in Ghana (Nyst and Baker 2003). Exonym favoring inventories include Japanese Sign Language (JSL) (George 2022), Korean Sign Language (KSL) (Ji 2022, Park and Jeong 2019), Taiwan Sign Language (TSL) (Chang 2011), and American Sign Language (ASL) (Kelly-Jones et al. 1981).

Social and structural influences appear to affect the generation of endonyms or exonyms across sign languages. Social influences include literacy, and the influence of prominent community members. Structural influences include the attraction of semantically transparent morphemes and output constraints.

Sign languages in populations with relatively high rates of literacy tend to index written source toponyms, producing predominately exonyms, whereas populations with lower rates of literacy tend to largely produce endonymic toponyms (Peng & Clouse 1977, Nonaka 2012, Nonaka 2015, Nonaka et al. 2015, Nonaka et al. 2020, Hofer 2021). The influence of formal education appears to reinforce the generation and spread of exonyms over time, and in some cases such as JSL, appears to lead to a decline in the use of endonymic toponyms (George 2022). Greater mobility and access to affordable means of video communication on smart phones appear to create broader networks of signers spread nationally that make the use of transparently indexed toponyms more felicitous for communication among varied signing communities; Hofer (2021) provides a discussion of how smart phone and map application use influence TibetSL toponyms.

Prominent community members help to select and shape the types of toponyms preferred (Stamp et al. 2014, Hofer 2021). Labov (2001) demonstrates how key community members can drive spoken language shift, and similarly, the work of Stamp et al. (2014) on BSL and Hofer (2021) on TibetSL provide specific instances of how community leaders and members shape toponym selection and spread. These studies show the significance of community membership and influence.

Nyst and Baker (2003) and Lutzenberger (2018) for the sign language of the Netherlands (NGT) recognize possible output constraints that mark sign anthroponyms, or personal name signs. They find that one-handed signs near the top of the head appear disproportionately in anthroponyms relative to other parts of the sign inventory and propose that this distribution represents a way to mark such signs as names.

Another structural influence on sign toponym outputs includes the attraction of semantically transparent source morphemes (Peng & Clouse 1977, Sutton-Spence & Woll 1999, McKee & McKee 2000, George 2022). JSL generates toponyms isomorphic to highly morphologically transparent Japanese characters of the source toponym at a disproportionally higher rate than expected. George (2022) investigates the distribution of roughly 900 JSL prefecture and city names listed in National Sign Language Toponym Map (Japan Federation of the Deaf et al. 2009). The most common source name character signs—*kawa* 川 'river', *shoo* 小 'small', *san* 三 'three', *naka* 中 'inside', and *i* 井 'well'—are represented in JSL toponym outputs 94% (93/99) of the time; this contrasts with a 59% (1151/1935) rate of representation of the remaining toponym character inputs. Other sign languages favor indexation to semantically transparent toponym morphemes. McKee and McKee (2000) find that New Zealand Sign Language (NZSL) surnames tend to map to highly semantically transparent names such as *Brown*. Sutton-Spence and Woll (1999) provide British Sign Language (BSL) tokens that represent the first letter of a semantically opaque initial source morpheme, followed by a mapping of the semantics of the second morpheme; for instance, *Montrose* becomes m-ROSE.

With respect to the flouting of initial morpheme preservation in a subset of KSL toponyms, any combination of social and structural factors offers a possible explanation. This work considers the influence of semantic salience; since JSL and KSL are related sign languages and JSL evidences such structural influence, this hypothesis merits investigation.

3 Method

This investigation of KSL toponyms analyses the data provided by the Ji (2022) description and examples of KSL toponyms. KSL toponyms that represented only the semantics of the second source name morpheme were examined; the input Korean toponym morphemes were evaluated to determine which had more transparent semantics, the initial morpheme or the second morpheme. Possible meanings for each morpheme were culled and then judged introspectively to decide which source morpheme had a more accessible meaning. For comparisons sake, certain KSL toponyms that represented only the initial morpheme semantics of the input were examined in the same way.

4 The Ji (2022) Classifications

Ji (2022) analyzed 106 KSL toponyms of metro city names in Gwangju from the *Gwangju Metropolitan City Sign Name Booklet Publication Project* by the Gwangju Association of Deaf People. Ji (2022) categorizes the KSL toponym database into five formation classes: 1) endonyms; 2) phonologically indexed names; 3) *hangul* (Korean script) initialized names; 4) semantically indexed names; and 5) blended names, *hangul* initialized and semantically indexed names.

Endonyms consist of source name independent signs such as 양동 *Yang-tong*, which is represented in KSL by reference to the Yangdong Market (Ji 2022: 172). The sign concatenates the signs for ECONOMY + PEOPLE, producing a toponym completely independent of the name *Yang* 陽, meaning 'sun'.

Phonologically indexed names represent the pronunciation of the source name, independent of the semantics. An example is the town *San-swu* 산수 山水 'mountain' + 'water' represented as MATH 算数, a homophone of the town name (Ji 2022: 171).

Hangul initialized names index the initial phoneme of each source morpheme. The signs for both *So-chon* 소촌 and *Nong-seng* 농성 index the initial consonants of each morpheme via the fingerspelling alphabet equivalent (Table 1).[1]

[1] In this paper, all sign language images from Ji (2022) are cited from Gwangju Metropolitan Association of the Deaf (2021).

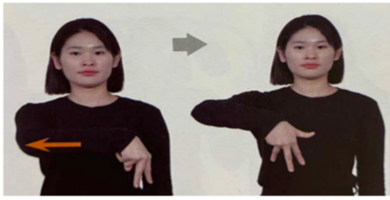	
[ㅅ] moves from the left to the right while changing to fingerspell [ㅊ]	[ㅅ] moves from top to bottom into the hand fingerspelling [ㄴ]
소촌	농성
***So*-*ch*on**	***N*ong-*s*eng**
‘little village’	‘fortress castle’

Table 1: *Hangul* Initialized Names (Ji 2022: 156)

Semantically indexed names make up the most common type of KSL toponym. Examples include *Ken-kwuk* 건국 ESTABLISH + COUNTRY and *Mang-wel* 망월 HOPE + MOON (Table 2).

		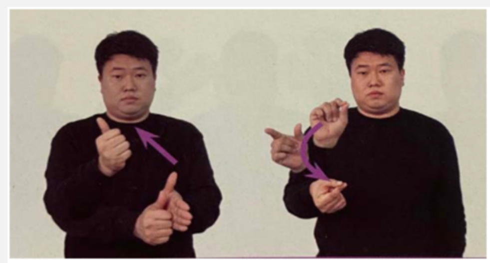	
ESTABLISH	COUNTRY	HOPE	MOON
設	**国**	**希**	**月**
건	국	망	월
ken	*kwuk*	*mang*	*wel*
‘establish’	**‘country’**	**‘hope’**	**‘moon’**

Table 2: Semantically Indexed Names (Ji 2022: 159)

Many semantically indexed names only represent the first morpheme, for instance:

- *Kyeylim-tong* (鷄林洞) → KYE (鷄) ‘chicken’
- *Kakhwa-tong* (角化洞) → KAK (角) ‘horn’
- *Songceng-tong* (松汀洞) → SONG (松) ‘pine tree’
- *Ssangchon-tong* (雙村洞) → SSANG (雙) ‘twins’
- *Yencey-tong* (蓮提洞) → YEN (蓮) ‘lotus’
- *Hyotek-tong* (孝德洞) → HYO (孝): ‘filial piety’

Blended names describe *hangul* initialized and semantically indexed names. The semantics of the initial morpheme of the source word appears in the KSL output concatenated with the fingerspelling of the first fingerspelled phoneme of the name. For instance the sign for *Kum-nam* 금남 concatenates k-KEUM, which indexes the first source morpheme semantics and initial consonant in a blended sign (Table 3).

						
ㅍ-FLAT	ㅂ-FLY		ㄱ-TREASURE		BIRD + ㅂ-PHOENIX	
平	**飛**	鴉	**錦**	南	**鳳**	仙
평	비	아	금	남	봉	선
***ph**yeng*	***p**i*	*a*	***k**um*	*nam*	***p**ong*	*sen*
'flat'	**'fly'**	'crow'	**'silk'**	'south'	**'phoenix'**	'hermit'

Table 3: Blended — First Consonant Initialized + First Morpheme Semantics Indexed (Ji 2022: 174–5)

KSL toponyms may also represent the initial consonant of the source name and blend it with the semantics of the second morpheme; these examples flout the convention of favoring the initial morpheme semantics. For example, *May-wol* emerges as m-WOL and does not represent the semantics of the first morpheme (Table 4).

							
ㅁ-MONTH		ㄴ-DOOR		ㅅ-DRAGON		ㅇ-MOUNTAIN	
每	月	樓	門	臣	龍	梧	峙
매	월	누	문	신	용	오	치
***m**ay*	*wel*	***n**wu*	*mun*	***s**in*	*yong*	***o***	*chi*
'every'	**'month'**	'building'	**'door'**	'vassal'	**'dragon'**	'Parasol tree'	**'peak'**

Table 4: Blended — First consonant initialized + Second morpheme semantics indexed (Ji 2022: 175–176)

5 Positional Prominence and Semantic Salience

Table 5 shows the distribution of source morpheme indices in blended toponyms from the Ji (2022) dataset. Of the sixteen blended names, ten index the semantics of the initial morpheme of the source toponym and ten index the semantics of the second morpheme. In nonblended KSL toponyms, when the semantics of the source toponym is represented, either the first or both morphemes' semantics appear in the KSL toponym. The blends present a contrast in that they license representation of the semantics of a lone second morpheme, so present an apparent exception. Why do the blends flout the normal preference for a sole initial morpheme representation?

Represent prominent position's semantics	First morpheme	Second morpheme	Tokens
☺	initial + semantic	——	4
☹	**initial**	**semantic**	**6**
☺	initial + semantic	semantic	4
☺	semantic	initial	*Samto* 삼도 (三道)
☺	initial + semantic	initial	*Hwaceng* 화정 (花亭)

Table 5: Blends — Initialization + Semantics Distribution

Ji (2022) explains that the position initial source morpheme has greater salience as it is consistently represented. With respect to blended exonyms the first morpheme is marked as more important because either the first phoneme or the first morpheme is always represented. Representation of the initial phoneme licenses the representation of the second morpheme's semantics.

However, there is no account to explain why blended names appear to arbitrarily represent the semantics of either the first or second morpheme. Apart from the six tokens, when a source morpheme's semantics appear in an exonymic toponym output the semantics of the initial morpheme are consistently represented in the Ji (2022) database; as a result, an account that deals with the non-represented initial morpheme semantics is necessary to account for the distribution of the blends.

The Li (2002) account of representation of the initial morpheme reflects a feature of Positional Salience. Positional Salience refers to the phenomena in which linguistic components in prominent positions are oftentimes preserved. Various frameworks such as Positional Faithfulness (Beckman 1998) address such features; for instance, word initial positions are typically cited as salient. KSL appears to favor indexation to some initial component of the source Korean toponym due to the salience of the initial position of the name. In cases in which the initial morpheme semantics is disfavored over the second morpheme, it is possible that a structural constraint inhibits the indexation of the initial morpheme's semantics.

This study investigates semantic salience as the possible constraint, since it comports with crosslinguistic observations that relatively semantically transparent source toponyms tend to emerge as indices in sign toponym outputs, as previously discussed for JSL (Peng & Clouse 1977, George 2022), NZSL (McKee & McKee 2000) and BSL (Sutton-Spence & Woll 1999). Table 4 provides four instances where the second morpheme semantics remains in the output while the initial morpheme has only the initial consonant represented. The range of possible meanings for each morpheme is described and then used to judge introspectively the relative accessibility or semantic transparency of each morpheme. Each morpheme was compared based on its possible range of meanings. Words with more fundamental meanings or Chinese character references in the pairings are considered more semantically transparent and license the skipping of the initial morpheme to represent the semantics of the second morpheme.

5.1 Blended Toponyms: First Consonant Initialized + Second Morpheme Semantics Indexed

In the toponym 매월 前月 'every' + 'moon' *May-wel*, 'moon', seems to have greater semantic salience than 'every'. The KSL sign MOON represents a character sign that traces the shape of a basic Chinese character so analogically bears similarity to salient character signs in JSL. The Korean word 월 can translate to 'month' or 'moon', depending on the context in which it is used, so appears to serve as a fundamental word. The Korean word '매' can have multiple meanings depending on the context; the current context suggests that 'every' serves as the most appropriate translation.

In 누문 樓門 'building' + 'door' *Nwu-mun*, 'door' represents a relatively more fundamental Chinese character than 'building' so has greater semantic transparency from that standpoint. The Korean word 누 can have multiple meanings depending on the context so in addition to the word 'building', it could refer to various words such as 'who', 'someone', or 'anyone'; in this case it seems complementary to 'door'. The Korean word 문 can have multiple meanings depending on the context; it could mean 'door', 'gate', 'document', or 'question', among other meanings.

In 신용 臣龍 'vassal' + 'dragon' *Sin-yong*, 'dragon' appears to provide the least ambiguous meaning and holds symbolic significance, so appears more semantically salient. The Korean word 신 can have several meanings such as 'god', 'deity', 'new', 'belief', or 'faith'. The Korean word '용' typically translates as 'dragon'.

In 오치 梧峙 'parasol tree' + 'peak' *O-chi*, KSL represents the source morpheme 'peak' as MOUNTAIN, a basic Chinese character sign that has high semantic salience and transparency. The Korean word 오 can have multiple meanings depending on the context. It could mean 'come', 'five', or 'crow', among other meanings; however, the Chinese character to which it refers, 梧, translates to 'parasol tree', a tree native to East Asia with large, distinctive leaves. The Korean word 치 can have several meanings depending on the context. It could translate to 'tooth', 'strike', 'chess', or 'measurement', among other possible meanings. The Chinese character that it refers to, 峙, translates to 'stand' or 'upright' in reference to a mountain or object in a prominent position.

Another name described by Ji (2022) is 백운 白雲 'white' + 'cloud' *Paek-wun*, which translates as ㅂ-CLOUD , seems to support the less semantically transparent morpheme. 'White' as a basic color term and Chinese character sign appears more semantically transparent than the word 'cloud'. The Korean word 백 could mean 'hundred', 'white', or 'back'. 운 could mean 'luck,' 'fate,' 'cloud,' or 'ship'. The context suggests that 'white' + 'cloud' represents a consistent translation.

Arguably, since four of the five names appear to prefer words with greater source morpheme transparency there may be support for the idea that relatively more semantically salient morphemes in the second position are licensed over toponym initial morphemes.

5.2 Blended Toponyms: First Consonant Initialized + First Morpheme Semantics Indexed

To truly test the hypothesis on the salience of semantic transparency, it is necessary to provide the same examination for blended outputs that preserve the initial morpheme. A successful test requires the second input morpheme to carry more opaque semantics than the initial morpheme. The three bimorphemic KSL examples from Table 3 receive an examination in this section.

The toponym 비아 飛鴉 'fly' + 'crow' emerges as 'fly', which represents a more basic character than 'crow', so appears to preserve the most semantically transparent morpheme. For 금남

錦南 'silk' + 'south', 'south' appears more transparent since it represents a fundamental Chinese character related to a cardinal direction; however 'treasure' the closest KSL equivalent representing the word 'silk' is preserved, thus the toponym fails to preserve the most semantically salient morpheme. In the third name, 봉선 鳳仙 'phoenix' + 'hermit', 'phoenix' is indexed in the output. Since KSL lacks a word for 'phoenix', it is represented by the sign 'bird' concatenated with 'tail-feathers', and 'bird' likely carries more semantic transparency than 'hermit'.

Examining the blended toponyms that solely represent the initial morpheme semantics shows two cases out of three that appear to support the indexation of the most semantically transparent source morpheme.

6 Constraints on the Representation of Nonprominent Morpheme Semantics

The findings of the introspective observations suggest that semantic transparency or salience may serve as a factor in the selection of the indexed morpheme output. The inconsistency in the semantic transparency results signals either the need for additional constraints or the presence of an unconsidered factor.

In response to the presentation, an audience member suggested that the phonological shape of the KSL output toponym may carry influence, and more easily produced outputs will be preferred over less phonologically efficient outputs. A key example appears in Table 3 with 비아 飛鴉 'fly' + 'crow' with an output ㅂ-FLY, in which the fingerspelled ㅂ 'b' assimilates naturally with FLY. A phonological output constraint would be a logical next step for careful examination.

Perhaps the most accessible way to test both the semantic source input and phonological output hypotheses would be to quantitatively examine the distribution of all segment and morpheme frequencies in the entire Ji (2022) dataset. George (2022) shows for JSL that statistically significant outputs tend to have structurally salient features. Similarly, KSL outputs could be examined for patterns that elucidate the motivation for KSL toponym output shapes.

This study presents a relevant question about KSL toponyms grounded in a broader examination of sign toponym typology. While this work remains inconclusive, it points to possible directions for identifying constraints that drive KSL toponym formation.

This study relies heavily upon the introspective judgement of the relative semantic salience of each KSL morpheme input so offers an unsatisfactory analysis that lacks empirical rigor. Further work grounded in testable hypotheses is required to demonstrate the effect of semantic salience or other constraints that drive the choice of KSL toponym outputs.

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