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Parameters And Lexical Divergence: A Study of Hausa Sign Language

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Abstract
This paper provides an analysis for a phenomenon which described how lexemes are different due to change of parameters in Hausa Sign Language (HSL) formation. Sign can be different from one to another as a result of changing one of the following: hand (s), movement, location and orientation. This article tries to identify the meaning variations as a result of the changing of parameter in sign formation. Therefore, it shows how the parameters are functioning within lexemes formation in HSL. Data were collected from the deaf who used to gathering in various centres within the eight local governments in Kano State and other data sourced from textual (books, pamphlets and research works) such as Gwammaja (2014; 2018) and Schmaling (2011; 2013 & 2016). The Hand Tiers Model initiated by Sandler (1989) was employed for the purpose of the analysis. The article identified lexical classes of different sign formation, with one or two hands. It is found that the signs differ as a result of orientation function within sign formation. It also exposed the locations used in sign production.

Keywords: Lexeme sign formation, Lexeme Divergence, Signs Parameters, Signs Orientation and Hand Divergence

Introduction

Morphology is devoted to the study of rules governing the formation of words in human language. The internal structure of a word may consist of a minimal unit, which may constitute a word by itself or minimal units which may be word parts themselves. Such minimal units (s) are referred to as morphemes and they are the basic minimum units at the level of morphology (Udoh et al, 2019: 107)). In the word formation of spoken languages, different morphemes were used such as free morphemes and functional morphemes. But in sign language, which is the natural languages of the deaf, the lexical signs are produced via hand, movement, location and orientation. It is often observed by morphologists that contemporary work in theoretical morphology has little impact on formal theories of grammar, which on average are content with a view of morphology quite close to that offered by the post-Bloomfieldian morphemic device. A notable exception to this situation is the pervasive use in Head-driven Phrase Structure Grammar (henceforth HPSG) of the distinction between words and lexemes familiar from Word and Paradigm approaches to morphology (Blevins, 2016).

This article aims to identify the total parameters used by Hausa deaf people in lexical formation. It also explains how the parameters have changed meaning as a result of using different parameters in sign formation within Hausa deaf language. The study adopted Hand Tier (Sandler, 1989) as framework for this study which comprises the function of hand location, movement and location (body or neutral space) as well as the final parameter known as orientation, which initiated by Battison (1978). This theory is used for the analysis of this article.

Literature Review

Schmaling (2000) outlines the phonological and morphological processes in Hausa sign language (HSL). According to her, "the morphological processes include simultaneous affixation, which may be used for both derivation and inflection and involves one or more of the following: classifiers (HS morphemes, orientation, location and movement 'ORI, LOC, MOV', hand arrangement as well as incorporation of non-manuals information." She confirms that "handshape (HS) known as classifiers are found in Hausa Sign Language (HSL) and treated them as

manipulators and substitutors (which comprise SASSes, handling and object classifiers) (P.54).” The book explains some issues concerning the morphemes and how they function in the lexical sign formation of HSL. She uses some icons, which are too technical and would make it difficult for the readers to differentiate the signs because sign language is a language of visual gesture; so, it needs pictures for illustration, but in her work, there is no single picture for illustration. She also used some signs which can be understood only by Hausa deaf signers who attended western education school. She also (2011) displays how the different lexical signs of family relation names in HSL are formed. She mentions lexical signs of families such as bàaba ‘father’, uwaa ‘mother’ and yaaròo ‘boy’ as well as `yaa ‘daughter’, ɗaa ‘son’, ɗan uwaa ‘brother’ and `yar uwaa ‘sister’ and also shows pictures of wedding, greeting and guest signs. She contributes a lot to the development of lexical signs of Hausa Sign Language because she shows pictures of some kinship lexical signs of HSL used by Hausa deaf signers in their daily communication. In addition, Schmaling (2013) establishes signs related to communication issues in Hausa sign language (HSL). She demonstrates lexical signs like daaɗii ‘delicious’, kyâu ‘beauty’, àmfàanii ‘importance’, baabù ‘there is none’ and àkwai ‘there is’, etc. However, she illustrates some pictures portraying some lexical signs of Hausa sign language, which are used by Hausa deaf signers in their daily affairs.

Gwammaja (2013) discusses the Hausa sign classifiers and its types, which relate to size, shape specifiers (SASSes), semantics, body and instrumental classifiers. He cites many examples of each of the classifiers in HSL with an analysis. Therefore, Gwammaja (2013) has displayed both single and double handed articulators used in signs production of HSL. He has mentioned the function of the parameters on numeration, incorporation of morphemes, mouth and double handed (balanced and unbalanced) signs formation. Finally, Gwammaja (2015) reveals the orientation (finger(s) selection and palm facing) as the ultimate parameter among the four parameters employed in lexical sign formation of Hausa sign language. He describes static and dynamic orientation as well as the roles played by palm and finger(s) selection in sign production. Furthermore, he defines the term deaf and its types, differences as well as sign parameters. He also identifies the inflectional processes of HSL

through the changes of orientation, movement, and location. In addition, he demonstrates how inflection operates on the nouns and adjectives and also displays factors that are operative in the formation of new lexical sign via derivation from one grammatical class to another, such as noun to verb or verb to adjective and vice visa. None of the above reviewed literature that shared the same scope with this article.

Signs Parameters and Lexical Sign Formation in HSL

Stokoe (1960) analysed sign formation in American Sign Languages (ASL) and devised the first system for describing the signs in that language. He named his system cherology which is analogous to the word "phonology" used in analysing spoken language. This system consists of three parameters, or *cheremes* (from the Greek word *cheir*, for hand). The three parameters are: tabula or tab (the location of the sign), designator or *dez* (the handshapes for forming the sign) and signation or sign (the movement of the body part forming the sign). Stokoe proposes that the parameters are, by themselves meaningless elements, but can combine simultaneously to form signs in language in ways similar to the combination of phonemes to form meaningful units in spoken language. In this system, there are twelve tabs, nineteen dezes, and twenty-four signs (Valli et al. 2005). A fourth parameter is added to Stokoe's system known as orientation (palm facing as well as fingers extension) which was invented by Robbin Battison (1978, cited in Wilbur 1980).
The parameters used in ASL for lexical formation is also applicable to Hausa Sign Languages.

Based on the data we gathered no lexical sign that is formed without using one of the parameters (hand, movement, location and orientation). In any formation of sign lexeme, the parameters such as hand, movement, location and orientation. This movement of hand can be a path movement of the hand from one location to another, either on the body or neutral space and a change in the position of the fingers, such as opening or closing; a change in the orientation of the hand could define the meaning.

Methodology

The methodology of gathering data for this study comprises primary and secondary procedure. The research is qualitative in nature.

Population

The article aimed to study the Antonymy formation by Hausa Deaf people in Kano State. Target populace of the study are deaf meeting in some deaf centres within the eight selected Local Governments of Kano Metropolis (Municipal, Dala, Fagge, Nassarawa, Gwale, Tarauni, Kumbotso and Ungogo) irrespective of their age, educational qualification, marital status, occupation.

Sampling Techniques

For the sample size and nature of the study, it is inappropriate to employ the whole population as the subject of the study, rather a fraction of population was purposively selected and worked on to represent all population of the deaf in centres of eight Local Government of Kano Metropolis. The study used the cluster sampling technique in order to locate the area of our target respondents. The centres comprise Tudun Maliki and Panshekara (Kumbotso), Ƙoƙi and Gidan Shattima (Municipal), Fagge and Gobirawa (Fagge), Tudun Wada and Kwanar Jaba (Nassarawa), Ɗorayi and Ɗiso (Gwale), Gyaɗi-Gyaɗi and Unguwa Uku (Tarauni), Ƙulƙul and Jakara (Dala) as well as Gayawa and Fanisau (Ungogo). We selected eighty (80) respondents, five from each centre.

Data Collection

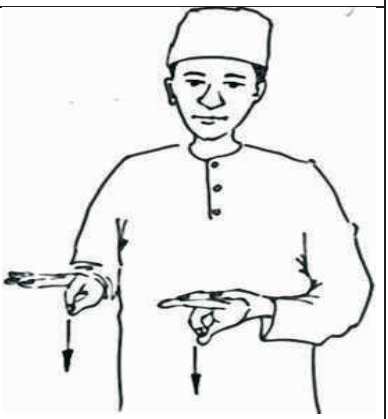
We gathered the eighty (80) respondents at Almunazzama Adult school located opposite gidan Maitangaran (Tal'udu) in Kano city. The data were collected from our respondents in two ways: firstly, we asked them to produce some lexical signs related to grammatical items such as noun sign, pronouns, verbs, adverbs. Secondly we show them some lexical related to grammatical class on flip charts and ask them to produced their sign. During the lexical signs production by deaf respondents, I used a camera for coverage their performance. Later, all the signs produced by respondents were drawn by (Kamal and Nafi'u). The drawn pictures were employed for the analysis of this article. Substantial information was also collected from my deaf friends in our daily conversation as well as via observations when the deaf were conversing in joints. Finally, some data were also found from written documents on Hausa sign language.

Lexemes Divergence

Like any sign language, Hausa deaf language lexeme signs are those they used in their daily discussion. The language has some grammatical items such as: noun, pronoun, verbs, adverbs, and adjectives etc. The Hausa deaf sign are produced via using the four parameters namely, hand, movement, location and orientation. None of the HSL signs can be produced without the above parameters. Once a parameter changes, then the meaning would be changed instantly. Let us see how meaning changes in the lexical sign of Hausa Sign Language.

Lexemes with Hand Divergence

Handshapes refer to the shape of the hand articulating a sign. Some researchers make use of feature chart for the description of all possible HS; others assume a set of basic HS, which are further specified with a number of distinctive features. Phonemically, there is a large number of Handshapes (HS) in HSL. This category deals with lexemes signs which are formed by hand(s) parameter. Below are the signs of pictures formed with hand(s).

S/N	One hand	Two hands
1.	 a. wannan 'this'	 b. yan 'today'

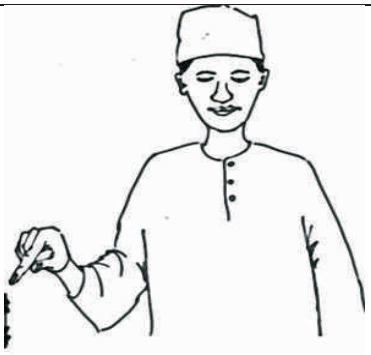
2.	 a. wannan 'this'	 b. yanzu 'now
3.	 a. Su 'they'	 **b.** mu 'we'

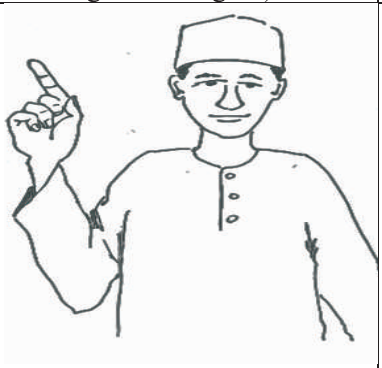
Figure 1

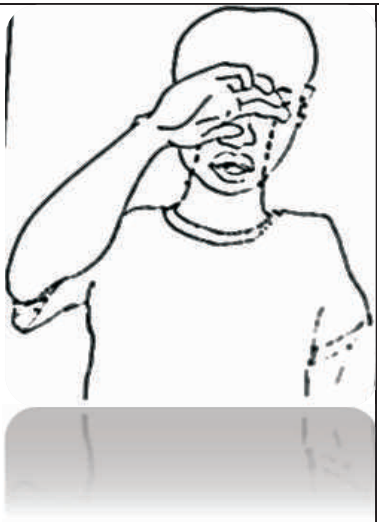
These signs show how Hausa signs produced with hand(s). In example 1a, one hand moves into the neutral space with an extension of an index finger and palm facing down wards to produce the sign of *wannan* 'this' whereas sign of 1b which is known as *yanzu* 'now' is formed by using two hands to move into the neutral space the with selection of the thumb and the index finger to for a ring shape and the remaining fingers extended. Therefore, the sign of 2a is produced in the same format with 1a. But in the sign of 2b, the sign is produced with the two hands moving into a neutral space with an extension of the index finger and the palm

facing down wards. In the sign of *su* 'they', only one hand moves to the neutral space with an index finger selection and palm facing downwards as well as a rounded movement (secondary movement) whereas in 3b, the sign is formed with two hands movement in a neutral space with an index finger extension and the palm facing palm down. All the fingers are slightly folded.

Lexemes with Location Divergence

Location refers to the point in space or on the body in which a related sign is to be produced. These locations are used to refer to or indicate objects (or loci) of interest, physical, present objects, persons, directions, or locations of the environment by pointing (deixis-showing), or indication of location in space or body being used as proxies to represent absent referents in discourse (Schmaling, 2000: 98-99). Therefore, signs are formed in either neutral space or on the body locations. See picture below:

	Neutral space location (away from signer ear region)	Neutral space location (closer to signer ear region)
4.	 a. Ta 'she'	 b. Ya 'he'
	Body location (eye region)	Body location (mouth region)

5	 a. kuka 'cry'	 b. dariya 'laugh'
	Body location (ear region)	Body location (mouth region)
6.	 a. Zaƙi 'sweet'	 b. Tsami 'lime'
	Neutral space location (closer to the signer)	Neutral space location (away from the signer)

7.	 a. Nan 'here'	 b. Can 'there'

Figure 2

The above signs show how the signs are formed in various locations. As we can see from sign 4a, the sign of *Ta* 'she' produced when hand is moved away from the shoulder side of the signer with an index finger extension as well as palm facing away from the signer while 4b, is opposite to 4a sign. Still in the sign of 5a, hand is moving to the neutral face (eye region) with all the fingers extension and palm facing away from the signer while, sign in 5b is formed when the hand is moved to the face (mouth region) with extension of all the fingers as well as to keep waving from right to left and vice-visa. However, the 6a sign is produced when the hand is moved to the ear location with selection of an index finger as well as palm facing away of the signer. In the sign of 6b, the hand is moving to the mouth location with an index extension and palm facing the signer. Finally, the signs of both 7a and 7b are showing the location of sign formation. In 7a, the sign produces when the hand moving to the neutral location which is closer to the signer while 7b sign produces if the hand moving to neutral space that indicated the distance from the signer.

Lexemes with movement Divergence

Sign can be either static or have path movement between two locations. Movement can occur on the body/face or in space. There may also be movement from the body into space and vice versa. Movement may also involve interaction between the two hands (separate, come together,

approach each other, contact each other), and the hands can move simultaneously and alternatively (Schmaling, 2000: 98-99). In the picture below, we can see how the lexical meaning changed as a result of hand movement.

	Movement (above head with second movement)	Movement (above head)
8.	 a. Fanka 'fan'	 b. Allah 'God'
	Movement (towards the signer)	Movement (away from the signer)

9.	 a. ɗauko ‘take’	 b. Ajiye ‘drop’
	Movement (up wards ‘shoulder’)	Movement (down wards ‘waist’)
10.	 a. babba ‘big’	 b. ƙarami ‘small’
	Movement (straight)	Movement (rotation)

11.	 a. Wannan 'this'	 b. Su 'they'

Figure 3

As in examples 8-11, all signs demonstrated different movements in the sign(s) formation in the Hausa sign language. In sign 8a, the hand moves to the neutral space (above the signer head) with an index extension and palm facing away from the signer, slightly rotating (second movement). In sign 8b, the hand moves to the same location as for 8a with the same orientation (finger extension and palm facing away from the signer). Therefore, in sign 9a, double hands move to the neutral space with all fingers extension and palm facing towards the signer whereas, sign 9b produces only if the double hands are moved to the space with all fingers selection and the palm facing away from the signer. Hence, the sign of 10a is produced when hand is moving to the space (shoulder side) with all fingers extension and palm facing downwards while the sign of 10b produces if the hand is moving to the space (waist side) with all fingers selection and palm facing the same as in 10a. In example 11a, the one hand moves into the neutral space with an extension of an index finger and palm facing downwards to produce the sign of *wannan* 'this'. Therefore, in the sign of *su* 'they', is only produced when a hand moves to the neutral space, with an index finger selection and palm facing down wards as well as rounded movement (secondary movement).

Lexemes with Orientation Divergence

Orientation is one of the morphemes primes which differentiate among varieties of signs within a sign language. It comprises information in both the location the palm is facing and the finger(s) selection during sign formation. Orientation might remain static within a monomorphemic sign and it may also be changed (Battison, 1973).

	Orientation (all fingers spread)	Orientation (All fingers bent)
12.	 a. Bazawara 'divorce woman'	 b. Budurwa 'matured girl'
	Orientation (Two fingers selection)	Orientation (One finger selection)

13.	 a. Mace 'female'	 b. Namiji 'male'
	Orientation (Four fingers selection)	Orientation (Two fingers selection)
14.	 a. Citta 'next four days'	 b. Jibi 'next tomorrow'
	Orientation (Six fingers selection)	Orientation (Eight fingers selection)

15.	 a. Shida 'six'	 b.Takwas 'eight'

Figure 4

Therefore, in sign 12a, the hand is moving to the body (breast region) with all fingers extension and palm facing towards the signer whereas sign 12b is produced if the hand moves to the body location (breast region) with all fingers folded. In 13a, the sign forms when the hand is moving into the neutral space with the index and middle fingers extension and palm facing downwards whereas 13b gets produced if the hand moves into the empty space with an index finger extension and palm facing downwards. In 14a and 14b signs, there are two movements: first hand moves to the ear region and then to neutral space but the orientation differs; the same happens in 15a and 15b.

Discussion

Based on the descriptions above, we can see that sign can be different in meaning if one or two parameters change in the process of sign formation. As we observed in 1a and 1b, the sign of 1a is formed with one hand parameter while the sign of 1b is formed with two hands parameter but they share the same movement and location. It is also the same as in 2a and 2b as well as in 3a and 3b. Hence, from sign 4 to 7, we express how the different location cause the change of meaning in the sign formation of HSL. In 4a and 4b, the procedure of the signs is the

same but the differ in location. As in sign 4a, the location is away from the signer's ear region while 4b is to the signer's ear region. Then, the sign of 5a is formed in the eye region whereas 5b is formed in the mouth region. The 6a and 6b share the same process of sign formation but differ in location. The location of producing the signs is what cause the change of meaning, the same in 7a and 7b. The next parameter in this analysis is movement. Different movements can change the meaning of a sign even if the remaining parameters are all the same in formation. As can be seen from 8-11. In 8a, the signs sharing the parameter in sign formation that is hand, movement, location and orientation, but what makes the difference here is the second movement of sign 8a. In 9a, the sign is made with the double hands moving away from the signer while 9b, the sign is formed when double hands move towards the signer. The same with 10a and 10b, in the sign of 10a, the hand parameter moves upward (shoulder) in the neutral space whereas in 10b, the sign forms when the hand moves to the waist location in neutral space. But sign 11 have similarities with sign 8 in terms of the second movement in the process of sign formation. Then, sign 12-15 are signs form with different orientation parameter which make the meaning to be different. In sign 12a and 12b, they are produced with the same hand movement and location but differ in term of the orientation because the 12a is formed with all fingers extended while in 12b all the fingers are bent. The same in 13a where the sign forms with the selection of two fingers (index and middle) while sign 13b forms with selection of only one finger (index). However, in sign 14, the finger selection shows the different orientation which resulted into different meanings of the signs of 14a and 14b. Finally, in sign 15, the finger extension led to the different of meanings of sign 15a and 15b.

Conclusion

This article discussed the parameters such as hand, movement, location and orientation, which are used in lexical sign formation of the Hausa Sign Language. We used some drawings to illustrate how hand(s) can move to the locations of either space or body and how the fingers are selected as well as where palm(s) are facing during the lexical sign formation. The signs were selected and allocated to the various figures for the analysis. The paper identified the signs, which are formed, either by single or double hands. It also found signs, which varied due to the

location of the sign formation. The paper also revealed how the orientation parameter functioned in sign formation as well as in the change of meaning. Finally, the article exposed how the signs differed due to movement varieties in the process of sign formation. The pictures of various lexical signs show how one sign differ from other in the process of formation. The divergences of signs are thus clear and easier to identify.

Suggestions

The Hausa Sign Language is a virgin language and there are so many areas in which nothing has been done. We recommend that future studies are needed in these various areas on Hausa Sign Language. It should also explore the following wider considerations and how they mark the function of parameters in lexical signs formation of Hausa Sign Language. Although some of the signs' formations identified having considerable potential to produce lexical signs in HSL, there is a need for further systematic studies across all these areas. Future studies in this area, which should involve phonology, morphology, syntax, semantics, and pragmatics as well as all those found in speech form can also be found in sign languages, including the Hausa Sign Language. Such studies are necessary if we need to advance the knowledge of sign language of Hausa as well as if these would be used in our curriculum for teaching and learning in our special schools. To do this, it would be important to document aspects of the language for the language to be free from language endangerment.

This article has studied the lexical sign divergences in Hausa Sign Language, which is the main focus of this article. It also used Sandler theory for the analysis of how signs are formed by using hand movement, location and orientation (parameters). Therefore, there is still so much to be done. For those who have interest in this field of study, they can do further studies or look at other angles for the survival of the Hausa Sign Language. It is advised that the government should fund such research works seeing that nowadays the sign language is being used to interpret political, economic and social issues.

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