Morphological Reduplication in Zimbabwean Sign Language

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Abstract
This study presents an analysis of morphological reduplication in Zimbabwean Sign Language (ZSL), an officially recognized yet under-documented language. Despite reduplication being a fundamental morphological process across sign languages for encoding grammatical and semantic functions, its specific manifestations in ZSL remain unexplored. Utilizing a qualitative methodology, this study employed digital ethnography and native-speaker intuition to analyze a corpus of naturalistic ZSL videos sourced from Deaf organizations and institutions. Data was analyzed through the theoretical lenses of Theta theory and Speech Act theory to elucidate the relationship between form, meaning and function. The study concludes that reduplication in ZSL is not merely a repetitive gesture but a core, rule-governed grammatical mechanism whose form is motivated by semantic structure. These findings make a significant contribution to the linguistic documentation of ZSL and have profound implications for sign language typology, demonstrating how understudied languages can reveal unique morphological innovations. Furthermore, this study provides an essential foundation for applied domains, including ZSL pedagogy, curriculum development and creation of more accurate linguistic resources for the Deaf community in Zimbabwe.

Keywords: Zimbabwean sign language; morphological reduplication; sign language typology; morphosyntax; non-manual morphology; linguistic documentation.

Introduction

The repetition of a sign, or reduplication, is a common morphological stratergy in Sign Languages (SLs), used systematically to modify meaning. Research has shown that this process can signal a range of functions. According to Putri (2019), reduplication is a common word formation process in both spoken and sign languages, where part of a word or sign is repeated, in order to yield a systematic change in meaning, for example,

'bye-bye.' It is a widely observed phenomenon across many of the world's sign languages, where a sign is repeated once or more times to convey additional semantic or grammatical meaning (Börstell, 2014).. Reduplication has been found to encode a range of functions, including plurality, intensity, aspect and distribution among others (Wilbur, 2005). However, specific patterns and functions of reduplication can vary considerably across different SLs communities. While reduplication

in SLs has been well documented for languages like American Sign Language (ASL), German Sign Language (DGS), Swedish Sign Language (SSL), among others, much less is known about this morphological process in Zimbabwe Sign Language (ZSL). ZSL is an understudied sign language used by the Deaf community in Zimbabwe, with limited research available on its structure and grammar.

This study filled the gap by providing a comprehensive analysis of morphological reduplication in ZSL. Specifically, it investigated the types of reduplicative patterns observed in the language and the semantic and grammatical functions that these patterns encode. By examining reduplication in ZSL, this study contributes to a broader understanding of sign language typology and the morphological resources available in visual-spatial languages. The introduction situates the current study within existing literature on sign language reduplication, highlighting the need for more research on understudied languages like ZSL. It outlines the key objectives and research questions driving the investigation of morphological reduplication in ZSL. This introduction lays the foundation for subsequent sections, which present the methodology, analysis and discussion of the findings.

The linguistic reality of Zimbabwe, as a multilingual country, is complex. Scholars like Amber (2017) have recorded as many as thirty-four languages, encompassing a wide range of categories from indigenous majorities to immigrant and sign languages. These are English, Shona, Ndebele, Chewa, Chibarwe, Kalanga, Koisan, Kunda, Lozi, Manyika, Nambya, Ndau, Nsenga, Shangani, Sotho, Tshwao, Tonga, Tswana, Venda, Xhosa, Afrikaans, Chinese, Dutch, French, German, Greek, Gujarati, Hindi, Italian, Polish, Portuguese, Chilapalapa, sign language and American Sign Language. This stands in contrast to the nation's formal legal framework. The Constitution of Zimbabwe officially recognizes only sixteen of these languages (Government of Zimbabwe, 2023). Therefore, a gap exists between the comprehensive scholarly record of the country's languages and the more selective official designation, highlighting the nuanced relationship between linguistic presence and state recognition.

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As shown in the extract, not all the languages Amber (2017) identifies are recognized in the constitution as official languages. ASL, for example, is not listed as well and there could not be found in the preliminary investigations of this study any other study that listed its existence and the users of ASL in Zimbabwe. This study focused on the sign language officially recognized as listed in the constitution. In Zimbabwe, there are approximately 300,000 Deaf and Hard of Hearing people spread over the country, who use SL to communicate (Gwarisa, 2018). Yet ZSL has no genetic links with any of the existing spoken languages in the country (Musengi et al., 2013).

In the 1890s, Rhodesia was divided into two provinces: Matabeleland in the west and Mashonaland in the east (Ngara, 1982). The division was premised along linguistic lines and based on numerical dominance of languages that were spoken in the country. Shona and Ndebele were the languages of the majority with Shona speakers occupying the central and eastern region while Ndebele speakers occupied the western region. The provinces were, thus, given nomenclature according to the languages of majority people in the areas. Ngara (1982) explains that the division was done to manage the extensive ethnic diversity that characterized the country. Even though over the years, the two main provinces were

further divided and Zimbabwe now has ten provinces (Manicaland, Matabeleland North and South, Midlands, Masvingo, Mashonaland East, West and Central, Harare and Bulawayo, Shona and Ndebele have remained the dominant local languages identified in both literature and policy documents. Thus, languages in Zimbabwe are categorised into major/main and minor (Ndlovu, 2009; Government of Zimbabwe, 1987, The Director's Circular 2007). Shona and Ndebele are the main/major languages while the rest are minority based on number of speakers (Government of Zimbabwe, 1987). Sign language in Zimbabwe falls under minority languages.

When the Zimbabwean Sign Language was given an official status under Section 6 of Zimbabwean Constitution, it triggered many scholars to produce literature in view of the Deaf and the hard of hearing in the country. For example, Mutswanga and Mapuranga (2014) investigated the perceptions of the hearing people on sign language usage to Deaf learners. Mutswanga and Sithole (2014) examined the perceptions of the Deaf on sign language teaching as well as communication by hearing people. Ndlovu (2014) examined the proficiency of sign language among facilitators of Deaf learners in Bulawayo primary schools. ZSL came into view in the 1940s when the missionaries-built schools for the Deaf, and it is in these schools, up to now, where most Deaf children acquire the language.

ZSL is a language officially recognized under the Constitution of Zimbabwe of 2013, Act 20 (Amendment Number) Section 6 (4), which stipulates that, "the state must promote and advance the use of sign language, as well as creating conditions for its development." The Zimbabwean government further introduced a Sign Language Bill in 2015, which aligns with the Constitution of Zimbabwe (Government of Zimbabwe, 2013), which acknowledges sign language as an official language and aims to promote its use in public life, education, media and government, oversee its development, standardization and provide for interpretation of services in public institutions and events among other things. As is the case with other minority languages in the country, there are no existing formal descriptive grammars on ZSL. Provision of a formal description of the language is therefore advancement of the language in terms of documentation and, by so doing, implementation of language policy.

Sign Languages are natural languages used by Deaf communities worldwide as their primary way of communication. Sign Languages are rich in visual-gestural expressions, utilizing hand shapes, facial expressions and body movements to convey meaning. In Zimbabwe, demographic data on the Deaf population in Zimbabwe is scarce, but existing studies suggest a significant number of Deaf individuals, particularly in urban centers (Mpofu & Chimhenga, 2013). Estimates suggest that sign language plays a crucial role in the lives of approximately 300,000 Deaf citizens, enabling them to engage in various social, educational and professional contexts. Among these 300,000 Deaf citizens of Zimbabwe, thousands receive education in ZSL at different levels (Deaf Zimbabwe Trust, 2015). There are several schools for the Deaf in Zimbabwe, which include Emerald Hill School for the Deaf, established long back in 1927, Henry Murray School for the Deaf, established in 1947, Jairos Jiri Naran School for the Deaf, established in 1969, King George VI Centre, Deaf Zimbabwe Trust and Nzeve Deaf Children's Centre. In addition, there are non-signers who are learning the language in various institutions (Mugari & Matende, 2017). In 2019, the Examination Council of Zimbabwe introduced sign language as a formal examination. A syllabus and an examination framework have also been developed for ordinary level and advanced level of education to be conducted alongside other subjects to assess candidates' proficiency in ZSL, including vocabulary, grammar and communication skills. Further, translations and interpretations are taking place in courts, on national broadcasting television and in other public platforms. This is happening when the language has not yet received formal, comprehensive documentation and description.

While sign languages may be widely used within Deaf community contexts, their application in education and other public spheres is often limited due to lack of necessary developments (Aarons & Akach, 1998). Lillo-Martin and Pitcher (2005) mention several advantages of having a morphosyntactic description of sign language, including the fact that it informs the development of teaching materials, curricular and pedagogical approaches, facilitating the

language's investigation into the properties, usage and cognitive processing and enhancing improved understanding between sign language users and non-users fostering greater inclusivity inter alia. An exploration on the linguistic structure of the language is therefore a development, which enables effective teaching and learning as well as the language's utilisation in the areas where it is used.

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Sign Language Linguistic Structure
Sign Languages are natural languages that utilize the visual-gestural modality, rather than the oral-auditory modality of spoken languages. As such, the linguistic structure of sign Languages differs in significant ways from that of spoken languages. Sign languages employ a rich repertoire of manual and non-manual articulators, including the hands, arms, body, face and head to convey meaning (Sandler & Lillo-Martin, 2006). Kiingi (2014) provides a definition that is comparative of SL and spoken languages stating that, "in spoken languages, articulation of language occurs through the mouth and its accompanying articulators and the reception of language occurs primarily via the ears (auditory and aural modality), whereas sign language employs the hands, face and upper body for the purposes of articulation and the eyes as the primary receptor (i.e. the manual or visual modality)." The basic building blocks of sign languages are distinct manual configurations,

movements and locations, which are combined and modified to form meaningful signs.

Lewis and Henderson (2012) identified five elements of SL as Hand shape (or Hand form), Orientation (or Palm Orientation), Location (or Place of Articulation), Movement, and Non-manual markers (e.g Facial Expression). Signs consist of one or more of the five parameters. The smallest element of a sign is a parameter, and if one of these parameters is changed when forming a sign, the meaning of the sign almost always changes. These observations are useful as a basis for analyzing the morphosyntactic structure of sign language. Unlike spoken words, signs are primarily organized in the spatial and temporal dimensions, giving rise to a highly iconic and simultaneous mode of expression (Cuxac, 2000). Additionally, sign languages often utilize classifiers-hand shapes that represent and localize entities and events in the signing space (Emmorey, 2023). These unique structural properties of sign languages have important implications for linguistic processes observed, such as morphological reduplication, which may manifest differently than in their spoken counterparts.

Reduplication
Morphology, the study of word formation, examines the systematic patterns through which languages construct new lexical items from existing elements. These processes are fundamental to linguistic productivity, allowing speakers to generate and comprehend novel words. A central hypothesis in this field, notably advanced by Aronoff (1976), posits that such processes are typically 'word based' operating on entire words belonging to major lexical categories. Within this architectural framework of morphology linguists identify several key operations, with affixation, compounding and reduplication being among the most widespread across the worlds languages. Reduplication, in particular, is a fascinating process that involves the repetition of all or part of a word to achieve a systematic change in meaning or grammatical function. A study of this phenomenon considers its formal properties, such as whether it is full or partial as well as its semantic and functional outcomes, which can range from intensification and plurality to aspectual modification. The following section delves into the specifics of

this process, beginning with its role in spoken language.

Reduplication in Spoken Language

According to Aronoff (1976, p.11), in the hypothesis mentioned, "All regular word-formation processes are word-based. A new word is formed by applying a regular rule to a single already existing word. Both the new word and the existing one are members of major lexical categories." Generally, morphological processes are formed by combining morphemes with words, morphemes with morphemes or words with words to form new words from existing words or morphemes. Morphological processes can be found in the level of affixation, reduplication and compounding. Reduplication is part of a morphological process for word formation by duplicating all basic forms or affixed forms, namely full reduplication or duplicating part of the basic forms, namely partial reduplication. The type of reduplication observes based on form, function and meaning, according to the referral language hierarchy. The process produces words with new meanings or change or does not change the meaning of the origin word (Loe, 2018).

Morphological Reduplication

A defining characteristic of sign language morphology is the use of reduplication, a process where the repetition of signs movement segment serves to modify its meaning or create new word. As Johnston et al. (2016) elaborate, this repetition is purposeful and systematic. The purpose is to modify some aspects of the sign meaning or to create a new lexical item. Börstell (2011) on his investigations on the reduplications of Swedish Sign Language (SSL) mentioned that reduplications in sign languages tend to express repeated actions and plural arguments. Reduplication in

SSL ordinarily communicates majority of occasions and/or referents but may also express intensification, progressing occasion or nonexclusive movement. There are fast reduplications and slow reduplications and there is also doubling reduplication. Bergman (1983) in Kyle and Woll (1989) and Berman (1983) in Kyle and Woll (1989) recognized three morphological forms that verbs experience related to aspectual modulation, namely: fast reduplication, slow reduplication and initial stop.

Reduplication has been found to be a highly productive morphosyntactic practice in sign language, typically occurring in terms of phonology, semantics and lexis (Wilbur, 2005; Pfau & Steinbach, 2003, 2005, 2006 within Germanic and American studies). The term in sign languages has been used by Kiingi (2014) to refer to the phenomenon whereby a sign is articulated repeatedly in either the same location (iterative) or in different locations (distributive). Johnston and Schembri (1999, p. 126) regard it as "repetition of the movement segment in a sign." Gil (2005) disputes equating reduplication to repetition, arguing that reduplication is morphological (i.e. it occurs within words) and therefore distinct from repetition, which is a phenomenon of syntax and discourse. The author further explains that repetition is considered to be generally composed of a single repetition of the lexical movement with a (non-meaningful) return/transition movement in between whereas morphosyntactic reduplication consists of at least two repetitions and sometimes three repetitions and serves grammatical functions (Wilbur, 2005). In Swedish Sign Language , for example, the sign for 'wait' consists of one repetition of the root, but if the sign is reduplicated, the root sign is repeated three times as exemplified below.

1.0) Repetition vs. reduplication in Swedish Sign Language (Bergman & Dahl 1994, p. 402):

WAIT: 'wait' – citation form (the colon indicates one repetition or twice the root).

WAIT+++   'be waiting, wait for a while' – three times the root sign WAIT, the three pluses indicating three repetitions of the root

Kiingi (2014) gives examples of noun signs that refer to concrete objects, such as DRAWER, BOOK and BAG, as including reduplication while the related actions (OPEN-DRAWER, CLOSE-BOOK and PICK-UP-BAG) involve a

single movement, such as pulling, closing and lifting in Ugandan Sign Language (UgSL).

Functions of Sign Reduplication

Previous studies on British Sign Language, American Sign Language, Ugandan Sign

Language, and Swedish Sign Language, among others, have shown that reduplication is used to express a variety of meanings (Pfau & Steinbach, 2006; Kiingi, 2014; Pfau & Steinbach, 2003). In ASL, for example, reduplication is used for a variety of linguistic purposes, including overt marking of plurality on nouns, aspectual inflection on verbs and nominalisation of verbal forms (Gavriloz et al., 2012). Reduplication has been found readily expressing plurality; both nominal and verbal is also documented in several studies (Fischer, 1973; Klima & Bellugi 1979; Pfau & Steinbach 2005, 2006. According to Gavriloz et al. (2012), reduplication involves the repetition, often partial, of the articulation of a sign.

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Sign Reduplication in Morphological Marking

According to Pfau and Steinbach (2006), reduplication in SL has been thoroughly investigated in German Sign Language (DGS), where it has been found functioning as a productive means of morphological marking. The authors further noted a particularly interesting case where it functions in DGS as reciprocal marking, which does not only involve reduplication but also conversion. Hence, DGS, unlike spoken English and German, does not have a single means of reciprocal marking. Rather, the specific realization depends on the underlying verb type. In DGS, like in other sign

languages, different verb types have to be distinguished, according to morphosyntactic and articulatory properties. These reviewed works are quite informative to this study, which seeks to explore sign formation processes in ZSL.

This review has highlighted significant cross-linguistic variations in how reduplication operates across different sign languages, establishing a robust typological framework. However, a critical gap remains: the morphological process of reduplication has not been systematically investigated within ZSL. It is unknown whether ZSL observes the distictions between external and internal event reduplication, utilizes non-manual (oral) reduplication for aspectual marking or employs a system of dyadic and triadic forms as described in other sign languages. Therefore, this study sought to analyze the forms and functions of reduplication in ZSL. Using the established typologies of Johnston (2001, 2014) as a framework, this study sought to identify and describe specific patterns whether manual or oral, external or internal, dyadic or triadic, that are operational in ZSL, thereby contributing to a broader typological understanding of this phenomenon in understudied sign languages.

Theoretical Framework

Theta theory was used as the main theoretical framework to analyse and discover, for example, relationships between semantic roles, such as agent, theme, patient, experiencer and syntactic positions in sentences in ZSL. The Speech Act theory was used as a tool for utterance analysis to establish the connection between ZSL compound forms, the communicative functions, which these forms are capable of serving, and the contexts in which the compound elements can have communicative functions. The integration of speech act theory and theta theory emerged as a powerful approach for analyzing the complexities of sign language morphosyntax. Researchers in this field, including scholars like Austin (1962), Searle (1969), Fischer (1978), Lillo-Martin and Klima (1990), Lucas (1989, 1995) have demonstrated how these two theoretical frameworks can complement each other, offering a comprehensive understanding of the form, meaning, and use of linguistic structures in sign languages. The study used discourse segments from video clips, which are

already published online as data sources. To use these videos in this study, permission was granted from owners of the websites and Facebook pages, such as Deaf Media Trust, Miss Deaf Pride, Sunrise Academy, Emerald Hill School of the Deaf, Danhiko School of the Deaf and Deaf Zimbabwe Trust School.

Methodology

The study adopted a qualitative approach, which is descriptive and explanatory in nature. The choice of the qualitative research approach was based on a desire to collect detailed information that would enable succinct description of ZSL compound formation. This explained the choice of discourse segments taken out of natural interactions for analysis from websites of organizations and institutions for the Deaf.

Design

The study used descriptive and explanatory designs. This approach was selected to collect detailed, nuanced information that enables a succinct description of the forms and functions of reduplication in ZSL. The design facilitated the analysis of discourse segments extracted from naturalistic interactions within the Deaf community, allowing for an in-depth exploration of this morphological process in its authentic context.

Population and Sampling

The population for this study consisted of all potential ZSL discourse segments published online by Deaf organizations and institutions in Zimbabwe. As the study could not analyze this entire population, a purposive sampling strategy was employed. Video clips (3-5 minutes in length) that exhibited a high frequency of reduplicative structures were specifically selected from websites and Facebook pages of organizations such as Deaf Media Trust, Miss Deaf Pride, Sunrise Sign Language Academy, and institutions including Emerald Hill School of the Deaf, Danhiko School of the Deaf, and Deaf Zimbabwe Trust School. Sampling continued until data saturation was reached, ensuring a comprehensive representation of the phenomenon across various pragmatic contexts like speeches, monologues, and dialogues.

Instruments

This study employed three primary research instruments: a curated digital corpus of video recordings of naturalistic Zimbabwean Sign Language (ZSL), a glossing annotation protocol enhanced with discourse context and semi-structured interviews. The video corpus was assembled from online platforms of Deaf organizations and educational institutions, with collection persisting until data saturation was achieved across various pragmatic contexts like monologues, dialogues, and speeches. The visual data was then analyzed using a glossing system—following established practices where manual signs are represented by English glosses and non-manual features by diacritics—which was improved by incorporating extended discourse segments to aid micro-analysis and contextual accuracy, despite the system's known limitations. Finally, semi-structured interviews were conducted in ZSL with 15 native Deaf signers; this protocol was used to present video excerpts and elicit their feedback on the researcher's morphosyntactic analysis, thereby directly integrating community perspectives into the analytical process.

Validity and Reliability

To ensure the validity and reliability, several strategies were implemented:

Triangulation

Data was cross-verified through three methods: analysis of naturalistic video data, intuitive native-signer analysis and confirmatory interviews with native Deaf participants. The statistical treatment of data relied on methodological triangulation, integrating thematic analysis of a saturated video corpus of Zimbabwean Sign Language (ZSL) from online sources with the researcher's native intuition and semi-structured interviews with 15 native Deaf signers. Video data was systematically coded for morphosyntactic patterns, and these findings were validated through elicitation and discussion during interviews. This multi-method approach ensured the ecological validity and reliability of the analysis by cross-verifying interpretations of sign order, non-manual features, and compound formation directly with the linguistic intuitions of the Deaf community.

Member Checking

Interview participants were presented with the researchers' interpretations of the video data to verify or refute the analysis, strengthening ecological validity.

Thematic Transparency

Thematic analysis was conducted through a systematic process of transcription, coding and theme identification, which inherently promotes both accessibility and transparency.

The process makes the analytical journey accessible by breaking down a complex data set into manageable, traceable steps—from raw data (transcripts), to organized concepts (codes), and finally to broader patterns (themes). This structured approach allows others to understand how the researcher moved from the data to the conclusions. Furthermore, it establishes transparency by creating a clear audit trail. Another researcher can theoretically follow the same steps, examine how codes were derived from specific transcript excerpts, and see how those codes were consolidated into the final themes, thereby demystifying the analytical process and making the findings more credible and verifiable.

Data Analysis Procedure

Data was analyzed using the thematic content analysis, which involved repeatedly watching and clipping selected video segments, transcribing and glossing the ZSL data observed in the videos, manually coding the glossed data for instances and patterns of reduplication and searching for, reviewing and defining emergent themes related to the form and function of reduplication. It also involved analyzing the data through the lens of Theta Theory to understand semantic-syntactic relationships and Speech Act Theory.

Ethical Considerations

The study utilized publicly available online video data. Permission to use these videos was sought and granted from the administrators of the respective websites and Facebook pages (Deaf Media Trust, Miss Deaf Pride, etc.). The purpose of the study was clearly explained to these institutions and organizations. For the interviewed participants, informed consent was obtained. All participants were native Deaf signers and active community members who volunteered to share their linguistic intuitions. Interviews were conducted in ZSL, and the data was handled with confidentiality and respect for the community's cultural and linguistic identity.

Findings and Discussion

The final word-level phenomena to be explored in this section is reduplication. Many sign categories in ZSL exploit different patterns of movement to create variations in meaning. One of the most important of these modifications is reduplication (repetition of the movement segment in a sign). Data showed different types of reduplication in ZSL, including iterative and distributive, fast and slow, sideward and backward oral reduplication without manual reduplication. It also emerged that reduplication in ZSL comprises some expressions namely, plural arguments, repeated actions, progressing occasion, intensification and reciprocal meaning as presented and discussed in detail below.

Overt Marking of Plurality on Nouns

The analysis confirmed that reduplication functions as a highly productive morphosyntactic strategy in ZSL, one primary function of which is to mark plurality, as evidenced by the following examples from a Deaf television interview:

HOME++ TOWN HARARE

'They are many houses in Harare'

(b)   ZSL FATHER ME CAR+++

'My father has many cars.

In example (2.1a) the sign for HOME is repeated twice from right to left depending on the non-dominant hand of the signer. The sign is articulated on the lateral side and it is not body anchored. Analysis of data revealed that nouns in ZSL are sometimes assumed to be singular in the absence of a numerical sign or a plural marker. The plurality of the noun, HOME is shown by reduplication of a sign in different location (distributive form) and a numerical sign is not necessarily used to mark plurality. Nominal signs in ZSL, for example, CAR as shown in example (2.1b) whose articulation is anchored on the body, cannot be subject to distributive reduplication in ZSL.

In example (2.1b), the sign CAR is a body anchored sign and it is (in iterative form) articulated repeatedly in the same location. The crooked D handshape edge of the knuckle touches the anterior aspect, centrally on the neck below the chin once when articulating the sign CAR. If repeated, it becomes plural 'cars. Some nominal signs, for example, BOOK can be articulated repeatedly either in a distributive or iterative form. Horizontal open palm of both hands closes and then open facing upwards to depict the action of opening a book. If repeated in distributive and iterative forms, the sign becomes a plural for 'books. The findings above confirms Fischer (1973) and Klima and Bellugi's (1979) observations, where they established that nouns in American Sign Language can be pluralized through reduplication. The grammar of British Sign Language explicitly describes reduplication as a method for indicating plurality on nouns (Sutton-Spence & Woll, 1999).

Kiingi's (2014) work is significant for an African context. He gives examples of noun signs that refer to concrete objects, such as DRAWER, BOOK and BAG, as including reduplication to mark plurality. This provides a direct parallel to the findings of this study, suggesting a real feature or a common morphological strategy across African sign languages. Data which were gathered from ZSL discourses show that noun reduplication comes in two types: simple and sideward reduplication. Example (2.1b) is in simple reduplication form because the sign CAR can be repeated once or more times to show plurality. This type of reduplication is similar to reduplication in spoken languages (Burkova & Filimonova, 2014). Under simple reduplication, the movement of the noun is repeated at some location within the signing space while sideward reduplication implies that the repetition is combined with a sideward movement (Pfau & Steinbach, 2006). The choice between simple and sideward reduplication in ZSL largely depends on phonological properties of the base noun.

Further, two handed reduplications as exemplified in example (2.1a) involves two hands, and so it is a modality specific phenomenon. In ZSL, reduplication appears less constrained as shown in example (2.1a) and (2.1b) because all noun types can undergo at least one type of reduplication (i.e simple/sideward) but do not block it altogether.

Reduplication Expressing Intensification
Reduplication is used to convey a range of meanings in ZSL, such as intensification as shown below.

(2.2a)   ZSL SCHOOL RUN FAST++

'You must run fast to school'

(b)   ZSL MEETING NOW++ COME

'Come to the meeting now!'

(c)   ZSL SCHOOL YOU++ GO

        'You must go to school'

(d)   ZSL COOK YOU++

        'You must cook'

In example (2.2a), the verb sign for FAST, (b) tense sign for NOW and (c) a pronoun sign YOU are repeated two times to emphasize and to show intensification. The signer can repeat the sign FAST and NOW two times to convey the message 'hurry up' and to express the need for urgency. The pronoun YOU in example (c) is repeated twice to show the need for urgency to go to school and the word *must* is infused in the sign YOU when repeated to show intensity in ZSL. Language intensity entails a quality of language that indicates the degree to which action toward a concept deviate from neutrality (Rogen, 2009). ZSL discourses revealed that non-manual reduplication is used to express intensive duration usually in combination with simple manual reduplication as shown in example (2.2a), with the non-manual markers for FAST being squinted eyes and raised eyebrows. And for example (b) NOW, the non-manual markers are squinted eyes and lowered eyebrows. It also emerged from the data that non-manual markers e.g tensing of the muscles around the nose, eye gaze and head nods are used to provide turn-taking cues and back-channel feedback for regulating conversations.

American Sign Language provides some of the dearest and most studied examples of intensifying reduplication. Klima and Bellugi (1979) identified a specific aspectual form called 'Protractive' or 'Durational' aspect, where rapid, tense repetition of a sign intensifies its meaning; for example SICK (single movement) SICK +++ (fast, tense repetition) means 'very sick' or chronically ill. Research on Italian Sign Language by Pizzuto and Corazza (1996) has shown that reduplication, particularly with a faster and more tense manner, is used for adverbial modification and intensification; for example, the sign for BEAT (as in hitting) can be reduplicated with a rapid, short movement to mean 'beat repeatedly and intensely.' The finding that ZSL uses reduplication for intensification (e.g FAST ++ for very fast, NOW++ for 'right now' is perfectly aligned with a universal trend in sign language morphology.

Reduplication Expressing Progression Occasion
Data gathered from ZSL discourses showed that reduplication in ZSL can express progression occasion as shown below.

(2.3a) ZSL   LETTERS LONG AGO COMMUNICATE

        'Letters were used to communicate a long time ago'

In example (2.3a), the description of the sign for LONG AGO had a bent B handshape palm facing backwards with some arch movements, lowered eyebrows and squinted eyes repeated many times to show a progression occasion of something that happened in the past. The core

meaning of the progressive is two-fold: duration and dynamicity (Wang & Wu, 2020). Duration means that the progressive applies to activities in progress which are ongoing and have no clear endpoints, for example, *I am crying* and *He is crying* while dynamicity means that the

progressive describes a situation being susceptible to change. It should be noted that the progressive is difficult in terms of its multi-functions and one to many form meaning mappings (Wu et al., 2007). In addition to the basic functions of indicating ongoing actions, it co-occurs with non-prototypical progressive verbs to denote repeated actions as in *He was coughing all day,* futurality as in *Tapiwa is winning the race* and subjective attitude as in *You are always complaining.* Progressive occasion can be past and present as below:

(b) ZSL   HE CRY++

‘He is crying.’

(c) ZSL   BUS SHE WAIT++

‘She was waiting for the bus.’

The first sentence in (b) expresses that the crying is ongoing now (present progressive) and likely to continue for a while; the verb sign CRY when articulated, the index fingers of both hands are located on the lower eyelids and move down the cheeks and this is repeated twice whereas the second sentence in (c) indicates that the waiting was happening over a period of time in the past (past progressive). The verb sign WAIT description is bent B fingers moving from the front towards the signer and the sign WAIT is repeated twice. ZSL employs a widespread typology strategy, where the repetition and modification of verb movement parameter serve as the primary morphological device for encoding progressive and durative aspect, direct mirroring the systems documented in British Sign Language, American Sign Language, Swedish Sign Language and German Sign Language (Pfau & Steinbach, 2003, 2006), Sutton-Spence & Woll (1999), Bergman (1983), Klima & Bellugi, 1979).

Reduplication Expressing Reciprocal Meaning
A particularly interesting case of reduplication in ZSL is reciprocal. marking as shown in the examples below.

(2.4a) ZSL JOHN MARY SHOOK++ HANDS

‘John and Mary shook hands.’

ZSL   DEAF HEARING STUDENTS COMMUNICATE++

(b)   ‘Deaf students communicate with hearing students.’

(c) ZSL JOHN MARY HUGGED++

‘John and Mary hugged each other.’

The signs for *shook, communicate* and *hugged* are verbs and are reciprocal expressions with double signs which use the right and left hand moving reciprocally. In example (2.4a), horizontal open palms move up and down to depict shaking of hands and it is repeated twice to express reciprocal meaning. In example b), the horizontal C handshape moves twice from the left to the right vice versa to depict giving and mutual relationship. The description of the sign HUGGED is open palm from both hands and they cross each other to touch both arms from left to right twice as exemplified in example (c). Although lexical reciprocals tend to be analyzed as distinctive (idiosyncratic), some phonological specifications are interesting among the inherently reciprocal verbs as observed by Lourenco and Figueiredo (2023). The first one is that all of them are bimanual. Pfau and Steinbach (2003) assert that one of the reciprocalization strategies used in DGS German Sign Language is to take a one-handed verb and copy its hand specifications into the second hand, resulting in a two-handed derived reciprocal. This strategy is also attested in Libras as a reciprocalisation mechanism. In ZSL, reciprocals are produced with two hands, a structure that suggests an iconic semantic mapping where each hand corresponds to a distinct participant in the event. Considering that each hand would be mapping (at least) one participant, and the hands are coding the very same event as exemplified above in example (2.4a-c) or collection of sub-events, it can be concluded that these participants share the same properties with one being the agent and the other the patient (e.g thematic relation) with respect to the event.

Another observation concerned the movement specifications of these verbs. Two different types of movements were identified, single (and repeated) movement and alternate movement (John shakes up with Mary) John communicates up with Mary. In (2.4a), the verb SHAKE-UP denotes a singular event that involves John shaking up with Mary and Mary shaking up with John. Therefore, the participants in this event are in a symmetrical relation. On the other hand, in (b), there seems to be a plurality of sub-events, some of which are events of A communicating with B and some of B communicating with A. The reciprocity in (b) is a result of an accumulation

of sub-events. The verbs like *hug, shake* and *communicate* in (2.4a-c) can be called symmetrical reciprocal verbs (Siloni, 2012) or reciprocal verbs with irreducible symmetry (Dimitriadis, 2008).

However, the fact that reciprocal verbs that are not symmetrical have an alternate movement might not be accidental in ZSL. Kuhn (2015, p. 124) notes that, even in French Sign Language, some verbs can have their form changed in order to indicate pluractionality. He calls "/alt/" the morpheme that is pronounced as the "alternating motion of the two hands" and that "entails that a plurality of events vary with respect to their thematic arguments" (Kuhn 2015, p. 126). According to Lourenco and Figueiredo (2023), in the case of the non-symmetrical reciprocal constructions, the alternate movement might be coding the presence of a plurality of sub-events, in which the participants alternate their thematic roles in a reciprocal way. In contrast, the symmetrical verbs have a single movement, which correlates with the fact that they denote a single event in which both arguments have identical (symmetrical) participation (Lourenco & Figueiredo, 2023). ZSL aligns with a robust typological pattern observed in French Sign Language, German Sign Language, American Sign Language and Libras, where reciprocity is derived through morphological modification of the verb.

The key modification entails reduplication and alternating movement, a process that is deeply iconic and modality-specific, exploiting the spatial affordances of the visual-gestural modality. This places the analysis of the ZSL reciprocals firmly within the mainstream of contemporary sign language linguistic research.

This section showed how the process of reduplication works, interacts with certain suprasegmental features in Sign Language and how it interacts with the semantic and syntactic features of the verb on which it operates. As in spoken languages, reduplication in ZSL was shown in some cases to cause phonological case manual changes internal to the new word. Thus for example, the sign FATHER or WORK is repeated twice when signed alone but when combined with the second sign the internal movement or repetition is eliminated. The data analyzed revealed that in ZSL, reduplication can be iterative and distributive, fast and slow,

sideward and backward as well as oral without manual reduplication. It was revealed that it comprises of expressions namely arguments, repeated actions, progressing occasion, intensification and reciprocal marking.

Conclusions and Recommendations
Conclusions
In conclusion, this study has demonstrated that morphological reduplication is a fundamental, robust and highly systematic process in ZSL, serving as a critical mechanism for expressing a wide range of semantic and grammatical functions. The investigation reveals a diverse typology of reduplicative patterns, including iterative and distributive forms, variations in speed and direction and the significant finding of oral reduplication without manual accompaniment. The analysis concludes that these forms are not arbitrary but are strategically deployed to convey core meanings, such as nominal plurality, verbal intensification, progressive aspect and reciprocal relationships. The identification of distinct movement patterns in reciprocal verbs, where alternating movement iconically represents a plurality of sub-events and single movement denotes a unified, symmetrical event, underscores the profound interconnection between phonological form and semantic interpretation in ZSL. Ultimately, this study confirms that reduplication is a central, rule-governed pillar of ZSL morphology, whose complexity and productivity are essential to the language's expressiveness and grammatical structure.

Recommendations
Based on the conclusions, several key recommendations are proposed to advance the development and understanding of the ZSL. First, it is strongly recommended that the linguists and Deaf community in Zimbabwe collaborate on a comprehensive language documentation project to create a large, annotated video corpus and a descriptive grammar, which is urgently needed to preserve the language and serve as a foundation for future work. Second, the findings on reduplication should be immediately integrated into ZSL pedagogical materials and curricula to move language instruction beyond vocabulary acquisition towards a deeper understanding of its grammatical system, thereby benefiting both Deaf learners and L2 students. Third, it is recommended that lexicographers incorporate

these morphological patterns into future ZSL dictionaries to aid standardization and accessibility. Finally, further research should be encouraged to explore the acquisition of these structures, their neurological processing and to conduct comparative studies with other regional sign languages. It is also imperative that government bodies responsible for implementing the sign language Bill utilize this research to inform policy, support further linguistic studies and ensure the accurate use of ZSL in public services and media, thereby fulfilling the constitutional mandate to promote and develop the language.

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