

FRAMES OF REFERENCE IN DHOLUO: A COGNITIVE SEMANTIC APPROACH

BY

AWINO OGELO

C50/ 72360/2014

**A RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILMENT OF THE REQUIREMENT OF THE AWARD OF
THE DEGREE OF MASTER OF ARTS IN LINGUISTICS**

DEPARTMENT OF LINGUISTICS AND LANGUAGES

UNIVERSITY OF NAIROBI

AUGUST 2017

DECLARATION

This research project is my original work and has not been submitted for examination in any other university.

Signature..... Date.....

Awino Ogelo

This project has been submitted for examination with my approval as the university supervisor.

Signature..... Date

Dr. Helga Schroeder

Dedication

To you

Son *Awino T T Junior*

To you

Siz Jesca, Bro Henry, Siz Minju, Bro Wuonlindsey & Siz Mindanny

To you

My late brother *Wuonaudrey*

MAY GOD BLESS

Acknowledgement

I thank the Lord Almighty for His love, His grace and His protection during the entire time of the MA studies

My sincere gratitude to my supervisor Dr. Helga Schroeder. Thank you for making semantics so attractive an area for me. I will be forever grateful for your valuable pieces of advice, gentle guidance and positive criticism. I am particularly appreciative of your constant push and reminders to soldier on even when distance and other engagements threatened to derail my progress. May God give you strength and health to extend the same unfailing support to others

Much gratitude to all the MA linguistics team of professors who took us through the entire process. Special thanks to Dr Zipporah Otiso for her wise counsel and direction concerning the MA programme.

I will always be grateful to these friends, who at one point or the other during the process of study supported or encouraged me; Bele, Mariga, Aju, Jackie, Marrey, MinT & Mindrae plus my MA classmates (Mokereira, Jane, the JAOs, Muturi, Suzie and all the rest) – God bless you.

Abstract

The research aimed to investigate the nature of Frames of Reference found in Dholuo. The study makes central the embodied thesis (a principle of the cognitive semantic approach which asserts that the structure of the human body shapes the human experience) as a descriptive tool to analyse the nature of the predominant Frame of reference in Dholuo (the intrinsic system) from amongst the allocentric and egocentric frames. The study found out that the bodily experience of Dholuo speakers heavily influence how they describe their environment. By transferring their body-part naming system to parts of objects (things) within their environment, Dholuo speakers are able to spatially describe the location of other objects (figures) in relation to parts of an already identified ground object. The study also validates the Neo-Whorfian assertion that aspects of language influence thought, by conducting two experiments- *Animal in a row* and *the Palmers mirror image test*. These experiments tested the relationship between the linguistic domain and the non-linguistic cognitive faculties of a Luo speaker. The tasks revealed that Dholuo speakers encode non-linguistic cognitive tasks in the same intrinsic frame as the predominant coordinate system in the language (Intrinsic system). The fact that Dholuo intrinsically interpret non-linguistic cognitive tasks as opposed to the Dutch for instance, who extrinsically interpret the same tasks, is in tandem with Linguistic relativity which states that speakers of different languages describe the world differently.

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List of Abbreviations

1PERS – First Person

2D- Two dimensional

3D- three dimensional

3PERS- Third person

ART – Article

BU – Boro Ukwala

DET- Determiner

DUPLO- trade mark for a company that makes plastic toys

FOR – Frame (s) of Reference

KSN – Kisumu South Nyanza

L 2 R – Left to right

LOC – Locative

PERF PST- Perfective in the past (past perfect)

PL- Plural

POSS-Possessive

PREP- Preposition

PRES –Present tense

R 2 L – Right to left

SING- Singular

SUBJ- subject

Definition of Terms

Absolute frame of reference- In this type of frame of reference, objects are represented with respect to fixed bearings within the environment such as the cardinal orientation

Angular descriptions – descriptions that involve coordinates

Angular specification – descriptions that involve the use of coordinates (FOR)

Egocentric frame of reference – this is a system where objects are spatially described with respect to the observer (ego).

Environment centred/allocentric reference frames makes use of the environmental elements to locate objects. There are two types of environment centred reference system; absolute and landmark systems

Figure – this refers to the object whose position has to be located.

Frames of reference- This entails the use of coordinate systems to locate the positions of objects (figure) in relation to some specified ground. In this study, Frames of Reference is used synonymously with coordinate systems

Goal – this is the landmark to which motion is directed

Ground- this refers to the object from whose position the figure is to be described/located. The term **relatum** mean the same as the term ground as used in this study

Intrinsic Frame of Reference- This entails the coding of objects with respect to their intrinsic axis. The coordinates are determined by the facets of the ground object.

Landmark system locates objects in relation to the salient features of the environment such as physical features like mountains, lakes, monumental buildings

Linguistic determinism- means language categories influence non-linguistic cognition such as memory, perception or thinking.

Linguistic relativity- as contrasted with linguistic determinism refers to the view that speakers of different languages think differently that is, linguistic categories influence aspects of an individual's thinking.

Non-angular descriptions – descriptions that use other spatial locative structures like contiguity and topology but does not involve coordinates

Non-static relationship- spatial relationship that involves motion

Participants- This refers to the individuals whom the researcher engaged during the research in collecting data. The terms respondents, informants, consultants and interviewee are used synonymously with the term participant

Relative Frame of Reference- under this Frame of Reference, objects are represented based on the perceiver's perspective of the world.

Researcher- refers to the individuals who participated in the interviewing of the participants during the data collection process. The study uses experimenter and interviewer to mean the same as the researcher

Source – this is the landmark from which the motion originates

Spatial Cognition- This is a system of mental frameworks that entails domains necessary for an individual's ability to recognize shapes, navigate successfully, and locate positions in relation to body parts among other things

Static relationship- spatial relationships that do not involve motion

Whorfian Hypothesis (weak version) – the principle which states that aspects of language influence thought. (Strong version) –the assertion that an individual's language dictates their world view

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CHAPTER ONE

INTRODUCTION

1.0. Introduction

In this study, the concept of spatial coordinate systems in Dholuo is semantically investigated. The spatial coordinate system normally referred to as the Frames of Reference is a concept within the theory of Cognitive Semantics. It therefore means that our study is hinged on Cognitive Semantic theory.

1.1. Background

1.1.1. Background to the language

Dholuo is a Western Nilotic language spoken in Kenya and some parts of Tanzania by the Luo people. Ochieng (1985:85) states that the Luos trace their roots to around Wau in the grasslands of Bahr-el Ghazal province of Sudan (presently the country of South Sudan). Greenberg (1966:85), explains that Dholuo belongs to the Nilotic group which is a sub branch of the Eastern Sudanic family that traces its origin to the Chari-Nile branch of the larger Nilo-Saharan language family.

The Luos are approximately four million in number, according to the 2009 Census. The majority of them are found in Kisumu, Siaya, Homabay and Migori counties in Western Kenya. A significant number of Dholuo speakers are also found in other areas of Kenya more specifically the urban areas like Nairobi, Mombasa and Nakuru where they reside and work. It is also possible to find other Luos in other parts of the country.

Several scholars affirm that there are two mutually intelligible dialects of Dholuo, whose differences are marked by grammar, vocabulary and phonology. Amongst them are Safford (1967), Okombo (1986), Oduol (1990) and Odhiambo (2011:1). The latter explains that one of the dialects is the Kisumu-South Nyanza (KSN) dialect spoken in the present day Kisumu, Homabay and Migori counties. The other dialect is what Oduol refers to as the Boro -Ukwala dialect (BU) which is mostly concentrated in today's Siaya County. He further states that the KSN is the standard dialect since it used in a wider geographical area as well as in radio broadcast and in the bible. This study therefore adopts the KSN dialect.

1.1.2. Background to the study

Cognitive linguistics focusses on the relationship between language and cognition and the involvement of language in processing and conveying of information. Spatial cognition, a domain within cognitive semantics, has representations that exist across several modalities. Such modalities include vision, touch, and gestures (Levinson 2003:25). Those modalities that do not directly involve language can be generally referred to as Non-linguistic spatial domains, while the other aspect that makes use of semantic properties is the Linguistic spatial domain. The linguistic spatial domain majorly concerns itself with motion and location. Key to motion description are goal (the landmark toward which motion is directed), and source (the landmark from which motion comes known as the trajector). The linguistic spatial domain does involve description about temporal dimension, change of location, manner of motion and other attributes. Descriptions involving change of location include use of figure (object to be located) and ground (the entity with respect to which the object is to be located).

Two classes emerge out of static locative spatial description. The class that makes use of the coordinate system and the other that does not. The first class makes use of the coordinate system or Frames of Reference in locating objects also known as the angular specification in locative description. In this type of description, a figure must be at a removed distance from the ground object; the coordinate systems then specify an angle that defines the figure's precise location. This makes it possible for the figure's position to be identified with respect to the ground.

Talmy (2000) as cited in Vyvyan & Green (2006) explains that spatial representation is configured along three parameters;

Figure/ground asymmetry - Between the figure and the ground, the former is given more prominence since it is the entity that needs to be identified. The ground becomes the reference object that enables the figure to be identified with precision.

Relative proximity of figure and ground - The choice of words that is used to describe the position of the figure in relation to the ground object depends on the proximity between them. A figure can be in contact with, adjacent to, or at some distance from the ground object.

Frames of reference - Reference frames are a system of coordinates which a language uses to locate objects in relation to the ground objects. Levinson (2003) classifies Frames of Reference into three types; intrinsic, relative and absolute.

The locative class that does not employ the Frames of Reference makes use spatial relators like place names (toponymy), deixis and topology. Such relators majorly employ contiguity and coincidence as opposed to angular specification in describing location. Our primary focus is on the angular specification (Frames of Reference) and how they are realized in Dholuo. The other area of interest is the relationship that exists between the Linguistic spatial notions and the non-linguistic spatial aspect within Dholuo.

1.2. Statement of the problem

Studies have shown that there are three main Frame of References that all languages can choose from, a pointer towards the universality of the Frames of Reference. It has also been documented that Frames of Reference can be realised both at the semantic (linguistic) as well as the propositional (conceptual) level within the spatial domain. Studies have as well revealed that there's a likelihood that a language may have all the three Frames of Reference but almost all languages choose a specific one as the most dominant. Once a language has opted for one of these Frames of Reference as the primary one, then most systems that support language like reasoning, use of gestures are likely to provide information in the same Frame of Reference.

By investigating the types of underlying coordinate systems using the cognitive semantics approach, this research aims to find out the predominant Frame of Reference in Dholuo. Most scholars amongst them, Atoh (2001) , Anyim (2010) , Ochola (2011) , Adoyo (2013) , Otieno (2014) who have researched on Semantics of Dholuo have concentrated on Cognitive semantics. That being the case, it is only Ochola (2011) who has touched on an aspect of spatial cognition with cognitive semantics. She has analysed Dholuo prepositions within the spatial domain using the image schema approach, a concept within cognitive semantic theory. Invaluable as her work is, it does not present to the fore the underlying coordinate systems that the speakers of Dholuo employ in expressing spatial relationships. Ngina (2015) whose work is of utmost importance in relation to this study, looked at spatial expressions in Ki-Kamba using the concept of Frames of Reference. However no attempt has been made to investigate the underlying coordinate system and identify the Primary Frame of Reference.

1.3. Research Questions

- 1) Does Dholuo have the intrinsic, the relative, the absolute or all three coordinate systems?
- 2) Which of the three coordinate systems is predominant in Dholuo?
- 3) How are the coordinate systems presented in Dholuo language?
- 4) Does the relationship between the predominant frame of reference in Dholuo and other non-linguistic spatial domains reveal the relativity hypothesis?

1.4. Objectives

- 1) To investigate if Dholuo language has any or all the three frames of reference
- 2) To identify the predominant coordinate system in Dholuo
- 3) To find out which grammatical categories capture the coordinate systems in the Dholuo
- 4) To establish whether the relationship between the frames of reference in the linguistic and the non-linguistic domains reveal the relativity hypothesis.

1.5. Rationale of the Study

Frame of reference is very significant to the general understanding of spatial cognition. According to Levinson (2003), its genesis as it is presently perceived, can be traced to Gestalt theories of perception. Rock (1992:404) as cited by Levinson (2003) explains that ‘there exists an organisation of units that collectively serve to identify a coordinate system with respect to which certain properties of objects, including the phenomenal self, are gauged’. This notion exposes the fundamental role that frames of reference play in explaining motion and locative description of objects within a spatial framework. Whereas the presence of frames of reference findings have been proven through research from languages like Guugu Yimithirr and Tzeltal, an attempt to validate these finding using Dholuo has not been undertaken thus far and this justifies the study. This research therefore is not only vital in validating the relevant tenets of cognitive semantic approach, but in providing a general insight into the understanding of the relationships between spatial domains within the larger spatial cognition framework. It therefore proves to be academically valuable.

1.6. The Scope and Limitations of the Study

This study aims to semantically analyse the frames of reference in Dholuo using the Cognitive semantic theory. Frames of Reference use coordinates to specify locations of objects. The predominant frame of reference is then identified and its influence on non-linguistics spatial sub-domains is noted. This in essence exposes the relationship between language, mental representation and human experience as stipulated within the theory of cognitive semantics. The study also employs the linguistic relativity theory to expound on the relationship between language and thought. This study does not focus on the other spatial domains that do not use coordinates such as deictic and topological notions, but only mentions them en passant. The non-static spatial domain like motion description in which direction both towards goal and from source is central, is also not our area of interest but only mentioned briefly.

1.7. Literature Review

1.7.1. Review of the Literature in Dholuo

Dholuo has been researched on extensively by a number of scholars both renowned and upcoming. Dholuo being a language like any other can be broadly split into five levels of analysis. Phonology, semantics, sociolinguistics, syntax and morphology. Several scholars have researched on all these aspects of the language amongst them being Omondi (1982) who researched on the major syntactic structures of Dholuo, Okombo (1982) whose focus was the interplay between morphology and phonology in Dholuo, Oduol (1990) whose sociolinguistic approach exposed Dholuo dialects, Odour (1994) who researched on Dholuo syllable structure, Atoh (2001) who looked at Dholuo nouns using semantic field theory and Okello (2007) whose focus was morphological reduplication in Dholuo. These researches and others not mentioned expose the amount of study that has been undertaken in Dholuo. As far as research in Dholuo is concerned, these are some of the pioneer studies upon which most of the later Semantic, morpho-phonological as well as syntactic research have a foundation. The semantic research is particularly directly linked to our present study (cognitive semantics) thus proving very significant.

The past decade has witnessed a rise in studies focussing on cognitive linguistics, cognitive semantics to be precise. Since an established language like Dholuo is used extensively,

possibilities that it is likely to draw a magnitude of interest from amongst such linguistic scholars is high. It is therefore expected that some of the most recent studies in Dholuo are based on cognitive linguistics and more specifically within the domain of cognitive semantics. Ochola (2011) did an analysis of Dholuo spatial preposition using the concept of image schema, within the domain of cognitive semantics. Adoyo (2013) focused on a semantic analysis of Dholuo verbs as used in metaphors using the conceptual metaphor theory. Otieno (2014) has done a comprehensive research on Dholuo metonymy, a concept within the framework of cognitive linguistics, using the cognitive semantic approach. My research will be hinged on the same domain of cognitive linguistic and my approach will be the cognitive semantic theory just like three aforementioned scholars.

1.7.2. Literature Review on the concept of frame of reference

Frames of reference is a concept that involves the use of coordinate systems in locating the positions of objects within space. As Levinson (2003) puts it, it traces its origin to Gestalt theories of perception. (Rock 1992:404) as quoted in Levinson (ibid) states that Frames of Reference encompasses ‘a unit that collectively serve to identify coordinate system with respect to which certain properties of objects, including the phenomenal self are gauged.’ Evans & Chilton (2010) define Frame of Reference as ‘a three dimensional coordinate system with a scalar quantity, that involves direction and non- metric distance.’ They explain that there is a variation on the coordinate system depending on the set up of the language in question. It therefore means that the orientation of the axes can be based on the self, can be based on someone else or on the environment.

According to Levinson (2003:26), even though much of the previous studies involving spatial cognition (frame of reference) have been done in other disciplines like psychology, philosophy and brain sciences, a considerable amount of research has gone into linguistics too. In linguistics, studies have been undertaken in both static and motion spatial domains. Topological notions for example, as Levinson (ibid) explains, has been studied in reference to closed class-morphemes like prepositions by Miller and Johnson-Liard (1976) ,Vandeloise (1991) as well as Talmy (1979) in emphasising the view that topological relations are in closed class morphemes. Deixis in reference to spatial expressions have also been studied with Fortescue (1988) and Jacobson (1984) focusing on the Eskimo languages. (Bowman et al 1955, 1996, 2000) as cited in Levinson

(2003) has done considerable research on spatial motion domain specifically on Korean languages.

Even though this study majorly relies on Levinson's tripartite classification of Frames of reference, a slightly different sub-categorization is noted. Pani and Dupree (1994) as cited in (Shelton & McNamara, 2001) classify Frames of Reference as Egocentric and Environmental reference systems. Egocentric reference systems specify location and orientation with respect to the observer. The ego is involved either directly, through mapping of coordinates onto the ground object (ego centred /relative) or indirectly, by defining objects' facets (object centred/Intrinsic). Environmental reference systems define spatial notions in relation to the elements of the environment. Under the environment centred system is the absolute system that utilizes fixed bearings such as the perceived direction of gravity as well use of cardinal orientation. The other category under the environment reference system is the allocentric system, which makes use of landmarks and weather elements

Levinson (ibid) has attempted a number of empirical analyses to test the types of frames of references that underlie various languages (Dutch, English, Hai, Tzeltal and Guugu Yimithirr). In this task, his main focus was to identify the predominant frames of references in the languages in question and investigate if there exists a correlation between such frames of reference found within language and the non-linguistic spatial faculties. His findings are fascinating. Whereas some languages have the ego centred systems as the predominant (Dutch and English), other languages (Hai, Tzeltal and Guugu Yimithirr) have the absolute system as the most commonly used with spatial description. Most notably was the observation that the predominant frame of reference in the language influences and is similar to that which dictates other spatial modalities. Levinson's thesis is useful to this research not only in our attempt to test the outcome of his empirical analysis against Dholuo but most importantly in terms of the strategies that he employs in realizing these results. One such technique that Levinson uses which is integral to our research especially in identifying the relative system is use of mappings. That is, use of translation, reflection and rotation, all employed in an attempt to locate the position of the figure in relation to the ground.

Antunano (2010) conducted a study to identify spatial relators in the Basque language. Her aim was to identify the linguistic elements that Basque speakers use to describe and conceptualize

space. Her research majorly concentrated on topological notions adopting what Levinson et al (2004) describe as topological relational markers. The major markers that she identified were spatial cases (locative case, ablative case and allative case), spatial nouns as well as motion verbs (simple, derived and compound verbs). During her verification of the topological markers, she used a booklet called *Topological Relation Picture series* that has number of on-line drawings that illustrate different topological spatial relations. She could then ask the informants questions concerning the location of the figure in relation to the ground and note down the markers that the informants used. The most frequently used markers would then be identified as the dominant one of that particular language. Antunano's empirical research is valuable to this study since one of the methodologies used here is similar to the use of the Topological Relation Picture series that requires informant to identify picture location in relation to some specified ground.

Shinohara and Matsunaka (2010) examined the uses and meanings of three Japanese spatial lexemes *mae* (front), *ushiro* (back) and *saki* (ahead). They also tried to advance Levinson's position that frames of reference are linguistically encoded by relating to previous research conducted in Japanese spatial lexemes like *mae* (front), *saki* (ahead) and *temae* (front). Shinohara and Matsunaka (2010) quotes (Matsunaka and Shinohara 2004,2005) who explain that *mae*, *saki* and *temae* as exhibiting restriction in the choice of Frame of reference thus making it hard for one to shift from one frame of reference to another. They explain that such restrictions are only possible if the frames of Reference are linguistically encoded. The empirical research on Japanese spatial language is important as it emphasises the position adopted in this research, which is the same as that taken by Levinson that Frames of Reference are found within the language.

To test the relationship between spatial language and the corresponding non-linguistic components, (Brown & Levinson, 1993; Pederson et al. 1998), conducted a number of experiments. The researchers identified Dutch and Tzeltal as the language of comparison. The predominant frame of reference in Dutch and Tzeltal is relative and absolute FOR respectively. The experiment's tasks involved reconstructing a spatial arrangement in a different setting to replicate the first arrangement that was constituted by the researcher. It was hypothesised that the participants from the two languages would reconstruct the spatial array in such a way that their respective predominant FOR is reflected in those particular re-arrangements. The results of the

experiment showed that majority of the Dutch speaking participants reassembled the array while maintaining left /right relations, reflecting a relative frame of reference. The Tzeltal speakers arranged the spatial scene north/south of each other as is the case of the absolute frame of reference. From their analysis, Pederson et al. (1998) concluded that the predominant FOR in a participant's language is reflected on the conceptual coding that the participant uses in non-linguistic tasks Brown and Levinson too came to a similar conclusion.

Danziger (2011) explored the relationship between the predominant FOR in Mayan (intrinsic) and the problem solving strategies amongst the speakers by conducting extensive experimental tasks. She approached her experiments by basing the classification of the FOR on Levinson's earlier binary (intrinsic) versus ternary (extrinsic) differentiation (Danziger 2011), where binary entails object centred and direct relations while ternary includes relative and absolute FORs. The reason for this classification, she explains, is that 'it separates FOR types according to their sensitivity to rotation possibilities of participant, ground, and figure-ground array' (Levinson, 1996, modified in Danziger, 2010) as cited in (Danziger 2011). Rotation manipulations enables each type of FOR to acquire a unique identity which would in turn be used for investigating non-linguistic aspects of cognition like problem solving strategies.

While acknowledging the simplicity of the *Animal-in-a-row* task, Danziger points out that the task only differentiates extrinsic FOR, that is, relative from absolute, but it does not differentiate the extrinsic from the intrinsic FORs. (cf. Levinson et al., 2002; Li and Gleitman, 2002) as cited in (Danziger 2011). Languages that predominantly use the intrinsic FOR do not depend on the identity and order of the animals in the arrangement and therefore rotation would not yield an accurate prediction of the relationship between spatial language and non-linguistic tasks.

A different task such as the *Palmer's mirror image task* explicitly differentiates the intrinsic from extrinsic FORs as reflected in non-linguistic tasks. In this task, printed shapes on plasticized cards are presented to participants who figure out if the shapes in question should be considered as being the same to or different from their mirror image counterparts (Levinson and Brown, 1994; Danziger, 1999) as cited in (Danziger 2011). The idea behind differentiating the mirror images is that in intrinsic encodings the images are indistinguishable as opposed to the

cases of extrinsic encodings. It is predicted that the languages with a predominant intrinsic system would treat the mirror images as identical as opposed to those with extrinsic FOR who would distinguish them. Danziger (1999) report that most Mopan speakers judged the mirror images to be equivalents affirming the assertion that aspects of language may influence thought.

Danziger however points out that one apparent flaw to the Palmer's task is that cultural and literacy differences and not language, may majorly contribute to the influence on judgement by the participants. The major concern surrounding the literacy differences is in the teaching of Roman alphabet that emphasizes on treating two dimensional mirror images as distinct from each other. This can be addressed by using three rather than two dimensional images.

In Dholuo, Ochola (2011) delved into the analysis of topological relators, specifically Dholuo prepositions. Even though her approach majored on non-angular specifications, her analysis is valuable since it exposes some aspects of spatial language within the realm of spatial cognition in Dholuo. Ngina (2015) analysed the spatial prepositions and determiners in Ki-kamba using the cognitive semantic approach through the concept of frames of reference. In her description of the spatial expressions, she unearthed the underlying frames of reference that Ki-kamba speakers use as they converse. She found out that both object centred and ego-centred coordinate systems are used in Ki-kamba with the absolute system tied to specific instances. This work, though based on a different language and focused on a specific dimension (used spatial expression), lays a strong foundation to this research which also intends to unearth the frames of reference that are used in Dholuo.

1.7.3. Literature Review on the relationship between language and thought

The debate surrounding the relationship between language and thought has attracted a host of views across disciplines – from cognitive sciences, anthropology to psychology. Levinson et al (2002) suggests that there appears to be two main schools of thought concerning the relationship between linguistic systems and conceptualization. The first line of speculation led by, among others, Fodor (1975), Landau & Jackendoff (1993) and Pinker (1994) proposes that language merely uses a universal conceptual base from which it acts as an output/input - pointing towards the existence of a language of thought. The other school of thought assumes that language may

play a role in reorganizing and reshaping the underlying cognitive domains such as space which may account for the unique properties of human thinking (Dennett, 1991; Lucy, 1992a; Spelke & Tsivkin, 2001) as cited in (Levinson et al, 2002). Most cognitive linguists share in the second line of argument and believe that a person's language reflects aspects of their conceptual domains. Cross linguistic differences should therefore indicate underlying conceptual differences.

According to Pederson & Nuyts (1997:4), positions taken by different scholars concerning the relationship between language and thought could be considered to be in some kind of continuum - with extreme views at both ends and moderate positions in the middle. At one end is the idea that language is the 'tool of thought' that is, people think through language. A case in point is the German philosopher, Johann Herder, who held the view that speech is 'thinking aloud' Pederson & Nuyts (1997:5). At the other extreme is the notion that language is independent of thought. Proponents of this view (such as Chomsky) explain that the only linkage between the two lies in complex systems that make it possible for the mapping of information from one entity to the other. Pederson & Nuyts (1997) further explain that between the two extremes are various views taken by different scholars which he divides into two;

- Language is derived from thought
- Thought is influenced by language

In as much as the two extremes have a few proponents backing them, the two intermediary positions are relatively common and have drawn much debate within the cognitive science circles and other related disciplines like psychology and anthropology. According to Pederson (1997), the psychologist Wilhelm Wundt argued that conceptualization gives rise to language. The same view is shared by the developmental psychologist Piaget, who believes that the acquisition of language by children depends on the child's cognitive development.

The position that thought is influenced by language is shared by among others, philosopher Wilhelm von Humboldt who believed that language structure leads to the organization of thought. Vygotsky too shares the same school of thought that a child's internalization of aspects of speech contributes to conceptualization.

1.8. Theoretical Framework

A brief explanation on the theories upon which this study is hinged is highlighted under this section. The Semantic cognitive theory and its basic assumptions are noted. A detailed description of the linguistic relativity approach is also included in this section. The relativity approach is important since it broadens our understanding of the issues under consideration.

1.8.1. Cognitive Semantic Theory

Cognitive semantic theory is found within the confines of Cognitive Linguistics. According to the Mentalists assertion, one's native language present them with experiences that dictate their perception of the world. Lee (2002:110) defines Cognitive Linguistics as a linguistic theory that explains how language contributes to the process of cognition. He explains that the role of grammar is to link the cognitive content (semantic meaning) to form (phonology). Richards & Schmidt (1985:91) explain that Cognitive Linguistics focusses on the relationship between language and cognition and the involvement of language in processing and conveying of information. Of greater importance is their observation that Cognitive Linguistics entails the relationship between Language and thought.

Cognitive semantics is a domain of cognitive linguistics. Its general view is that meaning is not found within the external world as the realists put it, instead it emphasises that meaning is conceptual, that is, it is based on a person's perception and comprehension. Taylor (1989:83) points out that as opposed to the structuralists who assert that meaning is independent of cognitive structures; the cognitivists' approach is that meaning has a cognitive bearing which is embedded in patterns of knowledge and beliefs. These knowledge and beliefs, as Saeed (1997:344) puts it are formed out of people's experience of 'growing up and acting in the world' Jackendoff (1987:123) plainly puts it that meanings of utterances are equivalent to the conceptual structures.

Evans et.al (2006) gives an insight into the arrangement of the cognitive semantic paradigm. They do not consider it as a single entity but as a multifaceted theoretical framework. It therefore means that this theory has a number of domains that arise from within it. Such concepts include the image schema, metaphor and metonymy, mental spaces as well as the frames of reference.

The other aspect of cognitive semantic theory that is of essence to this study are the tenets or principles that are useful in regulating the complementary, overlapping and sometimes competing conceptual structures within the theory.

The first tenet is that *conceptual structure is embodied*; also referred to as the embodied cognition thesis. Embodied thesis asserts that the nature/structure of the human body shapes the human experience. Embodiment refers to the structure of the human body both physically (physique and morphology) as well as the conceptual orientation. Both the physique and the human brain contribute to the general understanding of the human mind. It means therefore that the human thought and feelings are not autonomous but are linked to the bodily orientation. The human morphology and their physical environment make it possible for them to understand and talk about or describe the things they interact with. Language therefore becomes a manifestation of this cognitive embodiment (Vyvyan & Green 2006:46). One common example given by most linguists that reinforces the idea of embodied cognition and its universality in humans is in the colour realm. Vyvyan (2006) explains that when different organisms have different colour realms, they experience colours differently. Pigeons for example that have four colour channels as opposed to the three of humans would have a larger range of colours accessible to them hence will experience colours differently from humans. The same concept of embodiment and difference in experience can be said of humming birds' movement in response to gravity as compared to men's

Evans et al (2006) supports this by indicating that humans talk about what they perceive and this perception is largely influenced by the nature of their bodies. Lakoff (1987) concludes that 'our brains take the input from the rest of our bodies'. They seem to suggest that humans can only perceive the world from a human specific perspective and can only come up and describe concepts that relate to their bodily orientation. This assumption is core to the analysis of the findings from this study as both the intrinsic and relative frames of reference make use of bodily orientation to describe spatial locative relations.

The second tenet of the cognitive semantic approach is that *the semantic structure is conceptual*. This principle relates meaning components to concepts. A concept within the realms of cognitive semantics is a basic mental construct. The major claim of this assumption therefore

is that the meaning component of a lexical item found within an utterance is in the mind of the speaker of that particular utterance. For a hearer to make sense of what has been uttered, factors like context have to be considered but for the speaker, it lies in their mental domain.

The other principle of cognitive semantic theory is that *semantic representation is encyclopaedic*. Semantic representation within this principle refers to the conventional meanings of words and other linguistic expressions. Words therefore act as avenues through which vast repositories of knowledge specific to a particular domain can be accessed. Encyclopaedic knowledge encapsulates linguistic knowledge and is based on human interaction with others (social experience). Moore and Carling (1982) as quoted in Langacker (1987:155) state that ‘Linguistic expressions are not meaningful in and of themselves, but only through access they afford to different stores of knowledge they allow us to make sense of them.’ That being the stand of the two, other Cognitive semanticists suggest that even though words serve as windows to some vast knowledge, it does not mean that words and linguistic expressions have lost their conventionality, rather the conventionality of word meaning serves as a prompt for meaning construction by selecting the intended interpretation against the available context in which the utterance is made.

The fourth tenet holds that *meaning construction is conceptualisation*. This assumption posits that linguistic units are prompts to meaning constructions but not encoders of meanings in themselves. Meaning is not instantaneous but a construction that makes use of the linguistic units as prompts, that depend on the encyclopaedic knowledge and ends up at the mental sphere (conceptual level)

Away from cognitive semantic theory, an interesting aspect of language on non-linguistic tasks is noted. Fulga (2012) quotes (Landau et al 2009) who suggested that language does not permanently change cognitive representations but only regulates non-linguistic representations. Other scholars do not fully concur with Landau that language fully regulates spatial non-linguistic representations but only some aspects of the non-linguistic cognitive faculties. (Papafraou et al, 2008) as quoted by Fulga (2012) conducted experiments on how the paths of an object in motion can be described by different languages; both the satellite-framed languages and the verb-framed language speakers. It was noted that in describing linguistic tasks, participants from the two distinct languages portrayed differences in their description of motion

paths (meaning the language orientation played a major part in this difference). In non-linguistic undertaking (memorization) it was realized that both groups paid attention to almost the same details irrespective of the language background. The experiments explain that it's not an obvious fact that linguistic aspects would ordinarily be reflected in non-linguistic undertakings

Munnich et al (2001) as quoted in Fulga (2012) confirms that there is no obvious relationship between linguistic and non-linguistic aspects when he found differences between different languages (Japanese, Korean/ English). His task entailed describing locations of objects around reference points. He found out that whereas there were glowing differences in such a linguistic task, the same was not wholesomely true when it came to recalling spatial relationships that they had a short interval before came into contact with; recall is a task that involves memorization which is a non-linguistic activity.

Fulga (2012) summarizes all these by positing that 'so much more happens in the mind than is encoded in language, which would mean that the linguistic differences do not necessarily imply cognitive diversity.'

Levinson (2003:293) seems to concur with the other scholars like Fulga, Munichel and Landau by expressing his reservations about the assertion (presented by the above assumptions) that the semantics of a language is wholly equivalent and identical to the conceptual representation. However, he acknowledges that there is some aspects of similarity between the semantics of a language and conceptualization and refers to this as 'partial isomorphism'. This aspect of the theory is important to our study especially in relation to my forth objective that relates the predominant frames of reference to other spatial notions

1.8.2. Linguistic Relativity Approach

Linguistic relativity hypothesis is at the heart of the debate about the interplay between language and thought. Lucy (1997) proposes three levels upon which language is said to influence thought.

Semiotic level is concerned about the influence of any natural language on thinking. The focus in this case is between the human species with an established linguistic code against other non-human species and if the availability or lack of it (code) has an effect on the thought processes of the organism in question.

Structural level focuses on how speaking a particular language (s) may influence the thinking of the speaker. Does the morpho-syntactic configuration of Dutch, English or Dholuo influence how the respective speakers of those languages understand reality?

Functional level is about how the use of language in a particular way may influence thinking. When language is used for a formalised discussion versus the use of the same language in ordinary chit chat, does the choice of words for the different conversational scenes have any bearing on the thinking of the speakers? Lucy explains that with the advent of discourse analyses, this level has attracted increasing interests from scholars

Even though the three levels are in a sense interrelated and discussing one touches on all of them, the focus of this study is the structural level - that seeks to determine whether structural differences in various languages influence thinking.

1.8.2.1. Background to linguistic relativity hypothesis

Whorf, in his articles, which were reprinted in 1956, presents a bold formulation of Linguistic relativity that sparked much debate in the years that followed; the following excerpts from Pederson (1997:6) highlights his formulation

The automatic involuntary patterns of language are not the same for all men but specific for each language and constitute the formalized side of the language or its grammar. From this fact proceeds what I have called the 'linguistic relativity principle' which means in informal terms that users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers, but must arrive at somewhat different views of the world (1956:221)

An alternative formulation that he presented was;

We are thus introduced to a new principle of relativity, which holds that all observers are not led by the same physical evidence to the same picture of the universe, unless their linguistic backgrounds are similar or can in some way be calibrated (1956: 214)

Whorf's linguistic relativity principle which later became known as the Sapir -Whorf hypothesis, prompted a series of empirical studies. Much of these studies, basing the arguments on the premise of language universals as in the case of language independent domains like colour realms, found fault with Whorf's assertion which was considered extreme. It is therefore not the intention of this study to dwell much on Sapir – Whorf hypothesis in its original form, but to consider recent empirical findings in linguistic anthropology, cognitive psychology and cognitive linguistics, which partially attests to the Sapir- Whorf –hypothesis. These recent realizations suggest that language does influence (and not determine as Whorf put it) thought and action. This new understanding is famously referred to as the Neo- Whorfian hypothesis. The strong version of Whorfian hypothesis is that language entirely determine thought. A speaker will therefore only access cognitive categories that correspond to their linguistic faculties. The weak version states that the structure of a language may influence the performance of cognitive processes. It is the weak version that aligns to Neo- Whorfian hypothesis upon which this study is based.

1.8.2.2. Structure of linguistic relativity hypothesis

Within the claim that *properties of language* have some influence on the *patterns of thought* on *reality*, Lucy 1997 identifies three basic components;

Properties of language in this case majorly concerns morpho-syntactic elements which vary from one language to another. Dholuo for example uses of body part system to identify spatial terms that is used by the Frames of Reference in describing spatial scenes. Such word formation process is core to morphology

Patterns of thought include all the aspects of cognition from perception, inference, memory, attention and so on

Reality encompasses the basic everyday human experience or particular contextualized experience or the general human awareness (understanding) of their immediate environment

Lucy emphasizes the importance of language in linking patterns of thought and reality of thought. Language is crucial to the interpretation of reality as well as influencing thought about that reality. The argument put forward here is that since such interpretation arises from the selection of some aspects of experience unique to a particular group of speakers of a language,

each language would therefore have a particular interpretation of reality and not a universal one. The influence on reality of thought occurs when the language interpretation reflects the behaviours that are attributed to cognitive activity.

Pederson (1997:22) and Vyvyan & Green (2006:96) mention two concepts crucial to the understanding of the structure of Neo- Whorfian hypothesis;

- Linguistic determinism
- Linguistic relativity

Linguistic determinism broadly refers to the causal influence from linguistic to cognitive patterns (Pederson 1997:22). The term linguistic determinism is however specifically understood to imply that language categories influence non-linguistic cognition such as memory, perception or thinking. Following the idea of linguistic determinism, language could be said to facilitate human conceptualization. Cognitive linguists believe that language can be viewed as a means of externalizing thoughts. It therefore means that different ways of expressing ideas in language represent patterns of thoughts. (Vyvyan & Green 2006:96)

Linguistic relativity as contrasted with linguistic determinism refers to the view that speakers of different languages think differently. This view is informed by the assertion that differences exist in linguistic categories across languages and the linguistic categories influence aspects of an individual's thinking. (Pederson 1997:24, Vyvyan & Green 2006:95).

1.8.2.3. Relevance of linguistic relativity Hypothesis to our study

The study highlights a number of experiments conducted by various scholars which try to give validity to both linguistic relativity and linguistic determinism. These experiments (*Animals-in-a-row* and the *Palmers mirror image*) are replicated in our study and the results analysed. The linguistic relativity hypothesis comes in handy in analysing the outcomes of these tasks. For instance, the reassembly of a spatial array by a Luo participant whose dominant FOR is the intrinsic, in a manner that reflects intrinsic encodings, is in tandem with the idea that linguistic categories influence non-linguistic cognition (linguistic determinism). Such a participant would interpret spatial scene differently from another whose dominant FOR is the relative. Such a case

therefore reinforces the assertion that speakers of different languages interpret their environment differently hence have different world views

1.9. Research Methodology

1.9.1 Research Design

The study conducted three major field researches. The aim of the **first field research** was to find out the nature of FOR used in Dholuo and to identify the most dominant one. The tasks involved in this particular field research included presenting participants with different spatial arrays (made of toys) comprised of a figure and a ground for them to describe the positions of the figures in relation to the ground objects. Other tasks involved identifying physical locations such as towns in relation to other defined features or places.

The **second field research** was specific to finding out how Dholuo uses the allocentric system for navigation. It involved interviewing participants about the use of the landmarks and cardinal direction in navigating their way around the lake.

The **third field research** aimed at investigating the relationship between language and thought (linguistic relativity). The consultants in this case were taken through the *Animals- in-a row* and the *Mirror image* tasks in an attempt to determine the relationship between linguistic and non-linguistic spatial domain. The two tasks involved solving simple cognitive tasks by means of reassembling spatial arrays and classifying mirror images as similar or different. The third field research was particularly aimed at answering the fourth objective of this study.

1.9.2. Data Collection

In the first field research, the researcher used two Dholuo published texts (Stafford 1967) *An Elementary Luo Grammar with Vocabularies* and (Kibuye 1935) *Dholuo Grammar*. These texts helped to identify the nature of the spatial relators (grammatical categories) that are used by native speakers of Dholuo in expressing spatial relationships.

Most of the data was collected through the involvement of participants. A total of ten participants were interviewed, six males and four females with an age range of between 17 to 70 years. All the ten participants were competent native Dholuo speakers. All the participants were either residents or they worked at Kobodo division, Ndhiwa sub-county in Homabay county.

The participants were required to describe a range of locative positions of objects (figure) relative to the specified reference points (ground) .This was done using portable toy figures symbolic of familiar everyday structures like a tree, a ball, a car, a human figure and others of equal relevance. The positions of these objects were then swapped and the informants required to describe their locations, having labelled the figure and the ground distinctly. The exchange between the figure and the ground was done systematically so as to generate the right data that would be useful in identifying the predominant Frame of reference in the language.

The other task that the informants were subjected to entails the use of pictures with images of objects, people, structures and others. The participants were required to describe the position or location of a particular image in relation to another image within the same picture. This was then repeated with the other informants and the outcomes compared and noted

The informants were also subjected to identifying locations of towns by way of using the cardinal orientations. Five respondents were interviewed in Siaya and three in Ahero. Their mode of description were noted and later analysed in line with the set study objectives.

The researcher also sampled Dholuo stories from a number of Dholuo story books and pre-primary Dholuo grammar books. He identified the spatial locative relators like prepositions that were used within those particular stories.

Most importantly, the researcher used his first-hand experience as a native speaker of Dholuo in collecting the data. His personal involvement in everyday ordinary conversations with a number of natives in a natural setting that includes, work place, market, place of worship, bus stops and other areas where Dholuo is spoken was proved to be very significant to the study. He was conscious enough to take note of the relevant data that proved vital in the final analysis of the findings.

The second field research was specific to finding out how Dholuo uses the allocentric system for navigation. It involved interviewing participants about the use of the landmarks and cardinal direction in navigating their way around the lake.

A total of six participants were interviewed during this field research. Their ages ranged between 27 to 55 years and they were all males. Three participants were interviewed at Sori beach, two at Sindo beach and one at Nyandiwa beach. Sori beach is in Nyatike Sub County, Migori County.

Both Sindo and Nyandiwa beaches are in Suba Sub-County, Homabay County. All six participants were fishermen and residents of those respective beaches.

The participants were orally interviewed by the researcher who had a questionnaire detailing all the aspects of navigation that were relevant to the study. The nature, types and classification of winds and stars were discussed by the informants. The mechanisms by which fishermen interpret and employ the aspects (such as direction and time) of such navigation cues (winds, stars, waves), were also discussed by the informants. Finally, the researcher also sought clarification on the relevance of these navigation cues amidst the presence of better and accurate technological materials presently, and this too was discussed by the participants.

The third field research was about the *Animals-in-a row task* and the *Mirror image experiments*.

For the Animal-in- a row task, the following conditions prevailed;

Site

The experiment was conducted in a school environment since the participants were students. The school is in a rural setting, in Migori County, Awendo Sub-county Manyatta division. Two locations were selected for the experiment within the school, one indoor and the other outdoor. The indoor task was conducted in a classroom with both the doors and the windows closed. The outdoor task was conducted outside the classrooms. Both results were compared

Layout

In both the indoor and outdoor tasks, the tables were placed at a distance of about two metres apart. The participants sat in between the two tables first facing the stimulus table and then swivels at 180 degrees to face the recall table. The stimuli were arranged in a left right axis in the stimulus table. The participants were introduced to the stimulus table and then turned to face the recall table.

Participants

Sixteen participants, all students, were recruited for this experiment. The ages of the students ranged from 13 to 17, between grades 6 and 8. Half of the participants were male and the other half female. All the sixteen participants are resident of Manyatta division, a relatively rural environment. They all exhibited relative competence in Dholuo language. The first eight, four

boys and four girls participated in the indoor task while the other eight were subjected to the outdoor experiment.

Materials

The array was created from four toy animals (horse, bird, frog and squirrel) .Their sizes were almost similar but their shapes and colour were different. There was also an artificial house that was played at the extreme right of the presentation table and the extreme left at the recall table during the second version of the experiment

Procedure

There were two versions of the Animals in a row experiment; the first version entails the use of three animals as stimulus both for the presentation table and the recall table. The second round makes use of four animals as stimulus and an additional directional cue placed at the extreme end of both the stimulus and the recall tables.

The interaction of the researcher and the participant was on a one on one basis. For every round of the experiment, the participants were given basic instructions that included practice trials.

For the first version, the researcher set up a row of three animals on the presentation table facing either left or right along an east –west axis. The animals were placed 5cm apart. The participant was given as much time as they required so as to master the arrangement of the animals as they were. Once the participants signalled that they were ready, the array was deconstructed and the participant immediately given the three animals to rebuild on the stimulus table without rotation of the participant’s body. The researcher chipped in and helped make any correction in terms of the order; direction and identity of the animals were the participants to err. This procedure went on repeatedly until the participants’ results became consistent. For the experimental task, the researcher laid the stimulus array on the presentation table as before but informed the participant that that array would be reconstructed elsewhere. Once the participant indicated that they were ready, the array was removed, then the participant was made to wait for 30 seconds before turning at 180 degrees to the recall table where they were presented with the three animals to reconstruct. The researcher offered no assistance during this arrangement and the participant’s performance was regarded as it was. The experiment was repeated three times with each participant. A total of eight participants were involved.

The second version of the experiment follows a similar procedure as the first. The major difference in this case is that the stimulus animals are four instead of three plus an additional

orientation cue in the form of a 'house'. The house would be placed at the far right of the participant on the stimulus table and on the far left on the recall table with the animals either facing it or away from it. The participant is exposed to a stimulus of four animals out of which an array of three row of animals is constructed in the presentation table. The participant was expected to choose three appropriate animals out of the four given to reconstruct the spatial array. During the practice trials, the experimenter chose three out of the four animals and constructed an array of the animals- in a row in the stimulus table. The array would be deconstructed and all four animals would be handed over to the participant for rebuilding without rotation of his or her body. Participant too was to select three out of the four animals to use in rebuilding the array. The experimenter was at hand to help with any correction where necessary. After a number of repetitions with consistent results, the participant was asked whether they were ready, if their response was yes, the task would move to the experimental stage. Here a row of three out of the four animals would be constructed in the stimulus table, the participant would master the arrangement and upon signalling readiness, the array would be deconstructed and the participant expected to replicate the same in the recall table after a time lapse of 30 seconds under a rotation of 180 degrees of the participant's body. He or she is expected to choose the appropriate three animals from the four in the stimulus. Like in all the other cases, the researcher never engaged the participant in a conversation in during the recall stage. This task was repeated three times with every participant.

The first four participants participated in the task under a 180 degree rotation. The other four participants did the same tasks but under a 90 degree rotation.

The same procedure for the two versions was repeated by a set of eight different participants in the outdoor activity.

For the mirror image experiment, the following were the conditions;

Site

The experiment was conducted in the same school environment as the first. Unlike the first experiment, this task was conducted in an ordinary room setting with the doors and windows open

Layout

The task was conducted in a room. The pair of the 3D DUPLO objects were placed before the participants. Both objects were placed adjacent each other on the table to allow proper assessment by the participants.

Participants

Six participants, all students, were recruited for this experiment. The ages of the students ranged from 12 to 15, between grades 5 and 6. Half of the participants were male and the other half female. All the six participants are resident of Manyatta division, a relatively rural environment. They all exhibited relative competence in Dholuo language. The first six, three boys and three girls were introduced to the indoor animal in a row task were the same who took place in the Mirror image task. All the participants were rewarded for their participation

Materials

The objects were constructed from plastic blocks of DUPLO, which are mainly used by kids to build toy houses. The DUPLO blocks come in different lengths and colours. The pieces of blocks have protuberances with a spacing of half inch. The lengths of DUPLO blocks can be approximated by number of protuberances in each.

The current task required two pieces of pink DUPLO blocks of four length protuberances, two pieces of blue DUPLO blocks that are three protuberances long, two pieces of purple square DUPLO blocks of two protuberances each side with forward sloping protrusion.

Procedure

The experimenter explains to the participant that they are engaged in a game about things that are different and others that are not. The task of the participant is to judge whether the pairs of objects presented are similar or different from each other.

The experimenter takes the participant through an initial practice session which involves only the bad match pairs. A pair of DUPLO objects is presented to the participant and the experimenter explains to the participant that the pairs are different, giving reasons for this.

A different set of bad match pairs is then presented to the participant and the question as to whether the objects are similar or different is posed. The participant is expected to spot their difference and give explanations for the same, upon which the experimenter affirms that they are correct. In case the participant is unable to tell the difference or if the participant responds by judging the pair as being similar, the experimenter chips in by correcting the judgement and

giving reasons for that. A second trial of bad match pairs is then presented to the participant and the same different/similar question is asked. If the participant's response is positive then they qualify for the actual experiment, if their responses are inconsistent, then the experimenter thanks the participant and invites the next one.

For the mirror image and identical pairs, the study did not conduct practice trials since it was believed that an initial training would lead to a biased assessment of the pairs and would therefore not generate natural responses.

In the actual experiment, the pairs of the bad match, identical pairs and mirror image pairs are presented to the participants at a randomized order. The participant was encouraged to properly assess the objects by touching them and turning them around to make an informed judgement. Manipulations of the object parts to form the bad match, identical and mirror image shapes was done in the presence of the participant.

1.9.3. Data analysis

For the first field research the study follows a systematic study of (Stafford 1967) *An Elementary Luo Grammar with Vocabularies*. This exposes a number of spatial relators (adverbs, prepositions) which are used by speakers of Dholuo in describing their spatial environment. These spatial relators were identified and noted down. It is against such relators that the researcher was able to gauge whether the data collected from the participants had the right orientation for analysis.

Two participants' responses were not included in the final analysis due to massive inconsistencies. That left eight participants whose responses were noted. From these results the researcher identified the spatial relators that the participants employed during their description of locative positions (both in the case of using the toy-like structures as well as by use of images in pictures). Once these grammatical units were identified, the type of coordinates that was employed through them (spatial relators) in describing spatial locative positions were also identified. The same was repeated on the data that was collected from the participants' observations concerning locations of specific features like schools, church and Lake Victoria in relation to a specific reference point. The coordinate system(s) realized during these analyses were categorised appropriately.

In reference to the Dholuo stories and grammatical descriptions, the researcher isolated the spatial relators within their context of use and figured out the types of Frames of Reference that was employed in describing locative positions of objects from a notable ground referred to in the book.

As for the data collected by the researcher from his everyday interaction with other natives, he consulted three colleagues with native understanding to help verify the accuracy and authenticity of the material that he had collected

It should be noted that in the detailed presentation of the outcome of the *first field research*, the different versions of responses of the eight participants have been collapsed in two major groups herein referred to as *Participant/Respondent 1* and *Participant/Respondent 2*. This detailed analysis is has been presented in chapter two.

For the second field research the responses of the participants interviewed were recorded and later compared. Versions between the participants that had glaring inconsistencies were discarded. Differences were noted and similarities recorded. A tabular presentation of the data was then presented as the final analysis. Discussion of the data followed afterwards. These outcomes are presented in section two of chapter three

For the third field research, in the *animal-in-a-row task*, the responses of the participants were noted and coded for the intrinsic FOR. Particular interest was on the maintenance of the internal arrangement of the array by the participants. The results for both the indoor and the outdoor experimental tasks were also coded and compared.

In the *mirror image experiment*, the responses of the participants were noted. If the participants judged mirror images as identical, the response was coded as intrinsic. If they judged the mirror images as different, then that was coded as the relative Frame of Reference

The results for the third field research tasks (*Animals-in-a-row and mirror image*) have been elaborately presented in *chapter four*.

1.10. Conclusion

The focus of this study, Frame of Reference in Dholuo, has been introduced and the theoretical framework (Cognitive Semantic Theory and the Linguistic relativity approach) upon which this research is founded stated. The background to the language was highlighted and the choice of dialect (the standard KSN one) indicated. Following this is the background to the study where the concept of Frame of Reference is traced to Cognitive Semantics. The types of Frame of Reference available have been mentioned leading to the problem statement where the researcher wonders which predominant Frame of reference could be used by Dholuo speakers in expressing spatial notions.

The research questions have then been presented forth tied to their corresponding objectives which among others, aimed to; investigate the reference frames in Dholuo and identify the predominant one as well as establishing the correlation between linguistic frames and non-linguistic domains. The researcher then mentioned the rationale of study and at the same time indicated the scope after which the terminologies used in the study have been explained, followed by the review of the Literature and a brief insight on the theory. The researcher has then concluded by mentioning the research methods that he employed during his data collection and shown how he analysed the collected data.

CHAPTER TWO

TYPES OF FRAMES OF REFERENCE IN DHOLUO

2.0. Introduction

The main purpose of this chapter is to identify the types of frames of reference that Dholuo speakers employ in expressing spatial relationships. A number of examples drawn from different scenes, where informants were expected to describe locations of specified **figures** while relating them to already identified **ground objects** are discussed in detail. Other examples that involve identifying places (towns) and describing their position in relation to other places is also explained. This discussion eventually reveals the various types of FOR and how they are expressed in Dholuo.

This chapter is divided into four broad areas; the first area gives a brief overview of spatial relations, mentioning its static/motion and angular/non-angular categorization; special emphasis is on the coordinates that bring about angular specification. The second area introduces an in-depth analysis of spatial descriptive data generated from Dholuo speakers. This analysis exposes the types of FOR used in Dholuo. The third area briefly mentions the non-FOR spatial notions and how significant they can be to FOR description. Lastly is the recap of all that has been discussed in the whole chapter.

2.1. Some Considerations

(Levinson and Wilkins 2006) as quoted in Kemmerer (2010:140) explain that Categorical Spatial Relations have sub-classes that differ, but do interact, while maintaining independent semantic fields that are brought about by a specialised set of lexical items and grammatical constructions. Such spatial sub classes entail; deictic relation, topological relations as well as projective relations (FOR). These sub-classes can be grouped into two locative classes; the angular and the non-angular classes. Angular being projective relations, while non-angular includes topological and deictic relations. Even though non-angular relations are not core to this study, their contribution is important since Dholuo sometimes uses topological and deictic elements to express Frames of Reference descriptions.

Spatial relationships cut across a number of domains such as motion and static description. The study is specific to expressing spatial static locative relationships. Levinson et al (2003:66) explains that whereas the angular specifications make use of coordinate systems, the non-angular specification does not hence they are non-FOR. This chapter and by extension the entire study concentrates on the coordinate systems. A brief discussion on the non-FOR system will be presented at the end of the chapter.

FOR employs the use of coordinates to locate the position of a figure in relation to a ground object. Coordinates in the sense used here mean the orientation that makes it possible for the figure's location to be perceived from a particular vantage point. As the following examples illustrate, the coordinates can arise from the ground object, from the perceiver or from the earth's gravitational ordering.

1.

1) *Opira* *ni* *e* *nyim* *kom*
 Ball be (PRES) PREP (LOC) front chair
 (The ball is to the front of the chair)

2) *Orindi* *ni* *e* *bath* *yien* *kor* *ka* *acham*
 Stool be (PRES) PREP (LOC) side tree to ART left
 (The stool is to the left of the tree)

3) *Otieno* *ogedo* *piny* *aora*
 Otieno build (PERF PST) down river
 [Otieno has built (a house) down by the river]

In (1) the figure (ball) is identified in relation to the ground object (chair). The coordinates of the chair makes it possible to identify its front, back and sides. Since the figure faces the part that the coordinates have identified as the front, it therefore becomes easier to mention that it is in its front.

The second example exposes a different set up where the stool (figure) is to the left of the tree. The coordinates in this case arise from the speaker. The speaker is able to identify their left and right (coordinates), which is in turn mapped onto the tree, hence their left becomes the tree's left and their right becomes the tree's right. The stool therefore is to the speaker's left which

translates into the tree's left. This type of example is not frequent in Dholuo. Ordinarily, a speaker would use deixis to describe the same spatial scene, as in;

2.

4) *Orindi ni e bath yien gi koni*
Stool be (PRES) PREP (LOC) beside tree (PREP) this side
(The stool is to this side of the tree)

The coordinates can as well originate from the earth's physical orientation. When Otieno builds a house by the river, it is automatically considered down the slope by Dholuo speakers. This slope has been defined by nature and cannot change irrespective of the speaker's position. This kind of description reveals the absolute frame which will be discussed later in details.

Having talked about coordinates, it is essential to indicate that for the coordinates to help identify precisely the location of the figures in question, there has to be some distance between the said figure and the ground object, from which its position is located. Levinson (ibid) refers to this as **the search domain**. The search domain projects from the identified part of the ground object.

Figure 2.1 illustrates the concept of the search domain

Fig 2.1



In the above diagram, the distance between the figure (ball) and the ground (car) is the search domain.

Levelt (1996:78) as cited in Matsunaka and Shinohara (2010:302) refer to FOR as a perspective system; emphasising on the angle with which a particular figure is identified from within a broader search domain originating from the ground object.

2.2. Spatial representation and description

The diagrams below present sets of arrangements depicting scenes of spatial descriptions. All the arrangements involve descriptions on the horizontal plane. These sets of scenes were presented to ten participants whose task were to spatially describe the locations of the figures in reference to the ground objects provided. Eight of the ten respondents' observations have been presented in the form of two participants' as the section that follow reveals.

Fig 2.2



Fig 2.3



Fig 2.4



Fig 2.5



Fig 2.6



Fig 2.7



Fig 2.8



Fig 2.9



Table 2.1 summarises the native speakers’ spatial descriptions of the arrangements presented by the set of figures above.

Note: The table presents the participant’s responses as translated to English

Table 2.1

	Ground object	Figure	Native speakers’ spatial descriptions	
			Participant 1	Participant 2
Fig 2.2	car	ball	a) The ball is to the front of the car	a) The ball is to the front of the car
Fig 2.3	tree	dog	The dog is behind the tree	The dog is behind the tree
Fig 2.4	car	ball	a) The ball is between me and the car	b) The ball is to the front of the car
Fig 2.5	car	ball	The ball is to the front of the car	The ball is to the front of the car
Fig 2.6	tree	ball	a) The ball is to this side of the tree (pointing) b) The ball is to the right of the tree	a) The ball is to the right of the tree b) The ball is to the side of the tree towards my right hand
Fig 2.7	car	ball	The ball is to the front of the car	The ball is to the front of the car
Fig 2.8	car	ball	The ball is behind the car	The ball is behind the car
Fig 2.9	tree	chair	a) The chair is between me and the tree b) The chair is in front of the tree	b) The chair is to the side of the tree that faces me

2.2.1. Observations

Fig 2.2, 2.5 and 2.7 – In these sets of arrangement, the viewer’s position was not defined, and the participants were asked to relate the position of the ball to that of the car from any angle. All the participants responded as follows;

3.

5) *Opira* *ni* *e* *mbele* *mtoka*
Ball be (PRES) PREP (LOC) front car

(The ball is to the front of the car)

For **Fig 2.3** with the participants assuming the position of the girl (viewer), they all described the spatial scene as;

4.

6) *Guok* *ni* *e* *tok* *yien*
Dog be (PRES) PREP (LOC) back tree

(The dog is behind the tree)

For **Fig 2.4**, some of the respondents had the following description

5.

7) *Opira* *ni* *e* *kind* *a (n)* *gi* *mtoka*
Ball be (PRES) PREP (LOC) between me (1PER SING OBJ) and car

(The ball is between me and the car)

On further instructions to relate the position of the ball only to the car and not themselves, all participants had the following response;

8) *Opira* *ni* *e* *mbele* *mtoka*
Ball be (PRES) PREP (LOC) front car

(The ball is to the front of the car)

Fig 2.6 – Having been directed to assume the position of the viewer (girl), most of the informants had this description

6.

9) *Opira* *ni* *e* *bath* *yien* *gi* *koni (pointing)*
Ball be (PRES) PREP (LOC) beside tree PREP this side

(The ball is to this side of the tree (pointing))

One particular informant had this description

10) *Opira ni e bath yien kor ka achich*
Ball be (PRES) PREP (LOC) beside tree to ART right
(The ball is to the right of the tree)

When requested to describe the arrangement without using deictic terms, some informants described the spatial scene as (10) above while others had the description in (11)

11)
Opira ni e bath yien yo bada kor ka achich
Ball be (PRES) PREP beside tree towards hand (1PRS POSS) to ART right
(The ball is to the side of the tree towards my right hand)

Fig 2.8 – Like in **figures 2.4, 2.5 and 2.7**, in this set of arrangement, the ball remained as the *figure* and the car was maintained as the *ground*. The participants described the scene as follows;
7.

12) *Opira ni e tok mtoka*
Ball be (PRES) PREP (LOC) behind car
(The ball is behind the car)

Fig 2.9 – The task was to describe the chair’s position with reference to the tree. The informant assumed the position of the girl (viewer). Two informants gave the response in sentence (13)

8.
13)
Kom ni e kind a (n) gi yien
Chair be (PRES) PREP (LOC) between me (1PER SING OBJ) and tree
(The chair is between me and the tree)

Others described the spatial scene as (14) and/or (15)

14) *Kom ni e nyim yien*
Chair be (PRES) PREP (LOC) front tree
(The chair is in front of the tree)

15)

Kom ni e bath yien gi ko ma ngiyani

Chair be (PRES) PREP (LOC) beside tree PREP side that looks to (1PER SING OBJ)
(The chair is to the side of the tree that faces me)

A point to note from some of the responses highlighted above is that some respondents used *mbele* while others used *nyim* to describe the ‘front part’ or ‘to the front’. *Mbele* and *nyim* may be classified as synonyms. The major difference between the pair lies in their origin. *Mbele* is a dholuo loan word from kiswahili meaning ‘front’ while *nyim* is a dholuo polysemous word that means manhood (penis) as well as ‘front’. Whereas *nyim* may be deemed more authentic in reference to ‘front’; it was observed that most participants (especially the younger ones, below 40) used the latter when referring to front. We can presume that most younger Dholuo speakers shy away from using *nyim* more frequently because of its manhood connotation. Discussions involving sexuality is considered a taboo in most communities

2.2.2. Discussion

2.2.2.1. Figures 2.2, 2.4, 2.5, 2.7 & 2.8

Fig 2.2, 2.5 and 2.7 – all have similar responses despite differences in arrangements. Asked how they identified the front part of the car, the informants explained that ordinarily, the side of an item that carries its ‘nose’ becomes the front. ‘Nose’ in this case refers to the pointed part of the car that protrudes outwards, in our case, the car bonnet. The ball being located some distance away from ‘the nose’ of the car therefore means that it is in the front position.

The informants were able to recognize the back, the sides and the front (the nose) of the car. The part of the car that carries the nose (bonnet) is its front since noses are ordinarily found to the front of humans. In cases where the car has no apparent protruding ‘nose’ as in the case of buses and Nissan matatus, then the direction that the driver faces when he drives as well as the arrangement of other parts of the car like the side that the seats are facing, would help aid the speakers to identify the car front. When in a car, the parts that are aligned to the sides of the human body, adopt the tag ‘side of the car’ and the part of the car that is opposite the front

becomes the back. It means therefore that Dholuo speakers do transfer their bodily orientation to the objects that they frequently interact with.

This is in tandem with the first tenet of the cognitive Linguistic theory, the embodiment thesis, which states that *the way an individual views and describes the world is largely dictated by their bodily experiences. Their feelings and thoughts are linked to their bodily orientation.* The speakers transfer the body part configurations to objects and mark the object's parts assigning them roles similar to those played by their body parts. The Luo for example equates the protrusion and location of their nose to the protrusion that is seen in cars with bonnets. This makes it very easy for Dholuo speakers to describe location of figures in reference to the ground objects that have such defined features. Because such descriptions are expressed majorly through language, the aspect of embodiment in Dholuo could be considered to be tied to the Neo-Whorfian hypothesis which asserts that aspects of language can influence an individual's thoughts. The bodily orientation of a Luo speaker therefore is crucial in their interpretation of the world around them.

The use of an inherent feature of a ground object to describe the location of a specific figure is what Levinson (2003: 41) refers to as **the intrinsic system**

This system is realised when a salient feature within the ground object, be it front, back or sides is identified and related to a figure by the speaker, through an angle that extends outwards within a search domain that makes it possible to locate accurately the figure in question. Such salient features are regarded as being inherent or intrinsic.

An inherent feature is the basic part of an object, basic in the sense that they are the parts that define that particular object. Such features are functional, for example, the top of a table is the most basic part since it is the part that is widely used.

Referring to **figures 2.2, 2.5 and 2.7** above, the reason for the similar response from both respondents becomes obvious. Once the ball was identified as being in front of the car, with the figure and the ground remaining unmoved, then whichever direction the arrangement took, the description would still be similar. This shows that the change in position of the viewer or the perspective of viewing does not alter the description of spatial scenes involving a ground object that has an inherent part.

The car therefore is a good candidate for the object with an inherent feature since its front, back and sides are easily identifiable. This makes it easy for a figure located within its search domain to be identified and described in spatial terms.

The respondents gave two different responses in describing the spatial scenes in **figure 2.4**. Whereas response (8) is similar to those of **figures 2.2, 2.5 and 2.7** , response (7) is quite different; this difference can be explained as follows;

The spatial arrangement in **fig 2.4** appeared to the informants as, the figure (ball) being more in between the ground and viewer than, it being in front of the car. The close proximity between the viewer, the figure and the ground object could have led the informants into concluding that the position of the figure is more in between the viewer and the car, than being in front of the car

Figure 2.8 represented in the description below, is another example of an intrinsic system;

9.

16) *Opira ni e tok mtoka*
 Ball be (PRES) PREP (LOC) behind car
 (The ball is behind the car)

The back of the car just like the front, is inherent and therefore does not change with the change in the viewer’s position.

The following additional examples explain the intrinsic Frame Of Reference in Dholuo along the-horizontal plane;

10.

17) *Ogudu ni e tie kom*
 Hat be (PRES) PREP (LOC) foot chair
 (A hat is by the foot of the chair)

18) *Nyaroya wuotho e nyim min*
 Calf be walk (PRES PROG) PREP (LOC) front mother (3 PER POSS)
 (A calf is walking in front of its mother)

19) *Otieno* *ochung'* *e* *bath* *ot*
 Otieno be stand (PRES) PREP (LOC) beside house
 (Otieno is standing on the side of the house)

20) *Okombe* *ni* *e* *tok* *kabat*
 Cup be (PRES) PREP (LOC) behind cupboard
 (The cup is behind the cupboard)

In sentence (17) is a figure *ogudu* (hat) and the ground object *kom* (chair). An intrinsic part of the chair *tie* (foot) has been identified out of which a search domain extends. The location of the hat is described in reference to the foot of the chair. The hat is therefore some removed distance away from the chair. This description like most other intrinsic frame of reference does not indicate the direction along which the figure is placed.

Sentence (18) has *nyaroya* (calf) as the figure, *min* (the mother) as the ground. The mother's front has been intrinsically identified upon which the calf's location is described. It should be noted that even though the discussion is restricted to static locative descriptions, the calf and the mother are in motion. The fact that even if the figure and ground are in a unidirectional motion, and the locative description is not interfered with, means that an inherent feature of an object is 'naturally' defined. For example, the front of the cow is not altered even if in motion.

Sentence (19) and (20) present *Otieno* (name of a person) and *okombe* (cup) as figure and *ot* (house) and *kabat* (cupboard) as the ground objects respectively. The features *bath* (side) and *tok* (behind) have been identified as being inherent parts of the grounds mentioned. A search domain extending outwards from the inherent features makes it possible for the locative description of the figures.

Along the vertical axis, Dholuo makes use of the intrinsic FOR as presented in the following examples;

11.

21) *Oyala fuyore e wi yien*

White ants hover (PRES PROG) PREP (LOC) top tree

(White ants are hovering above the house)

22) *Gilop oliero e chuny ot*

Bulb be hang (PRES) PREP (LOC) heart house

(The bulb is hanging from the centre of the house)

In sentence (21), the tree has an inherent *wich* (top). It is from this top that the location of *oyala* (white ants) is identified. The white ants are at a removed distance from the treetop, making the whole description intrinsic

Sentence (22) presents *gilop* (bulb) and *ot* (house) as the figure and the ground respectively. The house has an intrinsic feature *chuny* (centre) from which the locative position of the bulb is described. It should be noted in this example that the verb *liero* (hang) indicates verticality and not in the locative preposition as was in the case of *wi* (top) in the previous example.

2.2.2.2. Figures 2.3, 2.6, & 2.9

The observation of **figure 2.3, 2.6 and 2.9** repeated here as **example 12, 13 and 14** respectively, represent a different set of descriptions from that of the intrinsic system

12. (Figure 2.3b)



29) *Guok* *ni* *e* *tok* *yien*
 Dog be (PRES) PREP (LOC) back tree
 (The dog is behind the tree)

Figure 2.3 presents an interesting observation. Both groups of participants were able to identify that the part of the tree that faced away from the viewer was its ‘back’. The dog therefore stood facing the back/ behind the tree. This description was possible despite the knowledge that the tree has no inherent side or back features. The speakers used **the relative FOR**. This type of system is realized when a figure is at some removed distance from the ground object but the ground either has no specific facet (naturally un-featured) or the facet is deliberately overlooked, giving room for the viewer’s perception. The coordinates arise from the viewer and are mapped onto the ground object from which the figure’s location is identified. The bodily asymmetry of humans makes it possible to realize the front-back as well as the left-right dimensions, which are in turn transferred onto the ground. The spatial relation ceases to be binary as was the case of the intrinsic system- but ternary-bringing together the figure, the ground and the viewer.

It is worth noting that the relative system is not commonly used by the speakers of Dholuo in describing spatial notions. The fact that the respondents instinctively adopted a relative interpretation in describing the scene in **figure 2.3.**, may be explained in a number of ways, but the study only highlights one. They were able to discern that the part of the tree that faces away from the viewer is its back. This is probably due to the fact that in every day interaction amongst the Luo, when an item A is at a location behind item B (where B is an object without any inherent feature), then that automatically becomes the back of B. The search domain therefore extends from the back of the tree towards where the dog is, hence, the description of the dog as being behind the tree.

13. (Figure 2.6b)



23)

Opira ni e bath yien gi koni (pointing)
 Ball be (PRES) PREP (LOC) beside tree PREP this side
 (The ball is to this side of the tree (pointing))

24)

Opira ni e bath yien kor ka achich
 Ball be (PRES) PREP (LOC) beside tree to ART right
 (The ball is to the right of the tree)

25)

Opira ni e bath yien yo bada kor ka achich
 Ball be (PRES) PREP beside tree towards hand (1PRS POSS) to ART right
 (The ball is to the side of the tree towards my right hand)

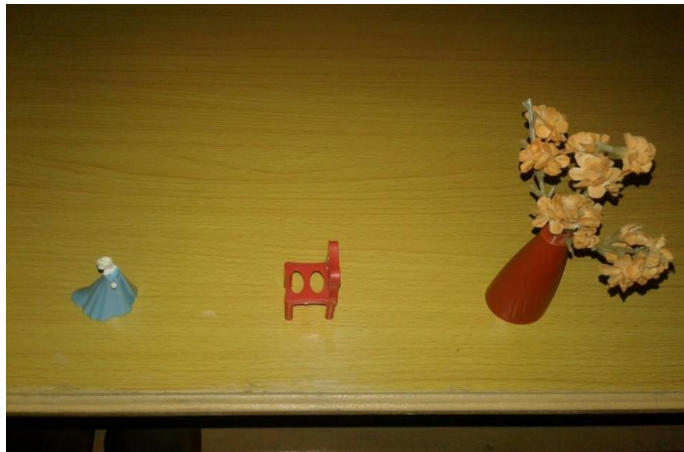
As stated in the preceding example, the tree, having no intrinsic feature presents a challenge to a Dholuo speaker when they want to spatially describe the location of a figure in relation to it. The first response of both groups of participants (23) makes use of deixis. The demonstrative *koni* ‘this side’ in sentence (23) has been used to identify the side of the tree where the ball is located. Use of gestures (pointing) automatically accompanies the use of the demonstratives by the speakers. It should be noted that, in most cases, the immediate (natural) manner in which a Luo speaker would describe a locative position involving ground objects that do not have intrinsic

features, is by the use of deixis. One informant however was quick to transfer his bodily coordinates unto the tree to come up with the description in sentence (24)

Sentences (24) and (25), indicates most of the informants' responses when directed not to use deictic terms. Once they had transferred their bodily coordinates unto the tree, hence the tree adopting a left/right axis, it was therefore easy for some of the participants to describe the location of the figure as being *to the right of the tree*. The second group of informants' perception is slightly different from the first. It can be quite difficult for a Dholuo speaker to internalize the idea that an object with no intrinsic feature can be assigned one. This explains the second group's response where, they do not directly transfer their coordinates to the tree but refers to the figure as being *to the side of the tree that is equivalent to their right hand*. Whereas they acknowledge that the figure is to the right, they do so by making reference to their own body rather than the tree's.

It was also observed that even when restricted to not using deictic terms, the informants could not resist pointing towards the side of the tree that they were referring to. Use of deixis by Dholuo speakers in describing spatial notions would be briefly discussed later.

14. (Figure 2.9b)



26)

<i>Kom</i>	<i>ni</i>	<i>e</i>	<i>mbele</i>	<i>yien</i>
Chair	be (PRES)	PREP (LOC)	front	tree

(The chair is in front of the tree)

27)

Kom ni e bath yien gi ko ma ngiyani
Chair be (PRES) PREP (LOC) beside tree PREP side that looks to me

(The chair is to the side of the tree that faces me)

Sentences (26) and (27) present responses that were made by most respondents in describing the above spatial arrangement. In (26), the position of the chair is identified as ‘front’ of the tree. In arriving at such a description, the informants mapped their coordinates onto the tree and perceived the side that faced them as the front. It would therefore be easy to describe the chair as being to the front of the tree

Sentence (27) describes the spatial arrangement slightly differently. The explanation to this would be that besides transferring their coordinates to the ground thus implicitly identifying its front, the respondents were able to animate the tree by labelling it as ‘looking towards them’. It is only too natural that the part of the body where the eyes are located is the front. The respondents then locate the chair as being within a search domain that extends outwards from the part of the tree that faced them.

2.2.2.3. Subtypes of the Relative FOR System

2.2.2.3.1 Reflection

This involves flipping over the viewer’s coordinates on the ground object. The mirror reflection of the observer’s bodily axes is imposed onto the ground. Take the following example;

15.

28) *Nyathi ochung’ e mbele yiend stima*
Child be stand (PRES) PREP (LOC) front electric pole

(The child is standing in front of the electric pole)

With the idea that an electric pole is unfeatured, then the possibility is that there is a ternary relationship in the above example. There is the figure (child), the ground (pole) and an observer. The figure therefore is between the observer and the ground, where the viewer is facing the

ground (pole). Reflection is realized in such a scenario when the ego's front/back axis is mapped onto the ground under a mirror reflection, that is, under a rotation of 180 degrees so that the part of the pole facing the ego becomes the pole's front, and the side facing away from the ego adopts the back axis. The child being in front of the pole therefore means that a search domain is projected from the part of the pole that is facing the observer. In this subtype, the left/right axis is not affected such that the ego's right becomes the pole's right and the pole adopts the ego's left as its left.

Besides reflection, there are two other subtypes of the relative FOR that Levinson (ibid) refers to as Rotation and Translation. These are briefly discussed below though it is worth noting that the subtype that is commonly used by Dholuo speakers, who employ the relative system in their speech, is reflection. The other two subtypes are rarely, if not used at all in the language

2.2.2.3.2. Rotation

This is realized when the bodily axes of the observer is wholly mapped onto the ground object under a rotation of 180 degrees. As opposed to reflection where only the front/ back axes are affected, this subtype affect even the left/ right axis. Referring to sentence (29), like was the case of reflection, a search domain is projected from the part of the pole facing the observer but the ego's right left axis is reversed. The ego's left becomes the ground's (pole) right and the ego's right becomes the ground's (pole) left

2.2.2.3.3. Translation

The subtype involves shifting onto the ground, the observer's bodily axes without rotation or reflection. Every observer's bodily axes is translated entirely onto the ground object, the front and back of the observer becomes the same as that of the ground and that too applies for the left/right axis. With reference to sentence (28) above, *the child being in front of the pole* would therefore mean, the pole is between the child and the observer, and the part of the pole facing the speaker would be the back of the pole. The front of the speaker and that of the pole would therefore be aligned towards the same direction.

2.2.3. Geocentric Spatial System

2.2.3.1 Overview

The area occupied by the Luo community (Nyanza) is geographically to the West of Kenya. Nyanza has specified South/Central geo-culturally defined regions. The implication is that within Nyanza, there is a defined South/ Central / North axis. Homabay, Migori, Kisii and Nyamira counties are to the South while Kisumu and Siaya counties are in Central Nyanza. The Northern parts extend outside Nyanza to Kakamega upwards to Kitale. Simply put, areas that are ‘below’ Lake Victoria are to the South and those that are either ‘above’ or ‘in front’ of the lake are Central. (*Refer to the map in the appendix*). This geographical/cultural differentiation has been incorporated into the everyday descriptions of places within Nyanza by Dholuo speakers. The data below presents such descriptions.

2.2.3.2 Observations

Two locations (towns) were identified as reference points (ground) in this field experiment. Siaya and Ahero (*refer to the map*). The informants (residents of these towns) were interviewed and asked two questions; Question one was asked to the residents of Siaya while question two was asked to the residents of Ahero

Siaya

Question

To the Informant (at Siaya): *Thoth jopur niang’ yudore kanye thurwa ka?*

(Where in this region do we find most cane farmers?)

Three of them responded as in (29) while two of the informants had (30) as their response

16

29) *Thoth jopur niang’ yudore loka*
Most farmers cane be (PRES PL) find the other side
(Most cane farmers are found on the other side)

30) *Thoth jopur niang’ yudore milambo*
Most farmers cane be (PRES PL) find south
(Most cane farmers are found in the south)

Ahero

Question

To the Informant (at Ahero): *Nam Lolwe nigi kon mane koa gi ka?*

(Which side is L. Victoria from here?)

All the three respondents described the location of the lake as in **(31)**. The third respondent gave an additional response as in **(32)**

31) *Nam ni koni*

The lake be (PRES) this side (pointing)

(The lake is this side (pointing))

32) *Nam ni yo imbo*

The lake be (PRES) towards West (pointing)

(The lake is towards the west (pointing))

2.2.3.3 Discussion

Sentence **(29)** presents a response *loka* lit ‘the other side’ to refer to the South. It should be noted that the term *loka* ‘the other side’ which is commonly used by both the residents of South and Central Nyanza traces its origin to the reference made to an adjacent river bank. *Loka cha* means ‘the other side of the river away from the side where the speaker is’. This term acquired broader meaning when Lake Victoria was used in place of the ‘river’. Since Central Nyanza appears to be separated from South Nyanza by the lake, residents of either side then referred to one another as *Joloka* (residents of the other side). It therefore makes much sense when the respondents referred to the South as *loka*.

Sentence **(30)** is an example of a response where some of the informants make use of cardinal direction in describing the side where most cane farmers are found. Even though in this scenario the ground object is well defined, sentence **(30)** is indicative of typical cardinal spatial descriptions involving locations south of the Lake. The concept of *Milambo* (South) is so culturally defined that irrespective of whichever part of Nyanza the speaker would use as a ground, the South would always remain, making the use of ground unnecessary.

As sentence (31) indicates, when presented with the question, *which side is L.Victoria from here?*, some informants' first reaction was to point towards the direction that they felt the lake was. Others appeared more general by using the cardinal direction sentence (32).

2.2.4. Note on the Allocentric Spatial System

An important point to note concerns this study's approach to the allocentric system. The use of fixed bearings that are environmentally defined, like cardinal direction equivalent to North, South, West and East; or the orientation of the physical features (land marks) such as along the slope, up the hill, down the river etc., to express the location of specific figures in relation to ground objects makes up what we generally refer to as **the allocentric system**. Levinson (2003:90) explains that these bearing define 'an infinite sequence of parallel lines (a conceptual slope) across the environment. Unlike in the first two subtypes where the focus was on the features of the ground object and the ego's perspective, the allocentric system uses coordinates from fixed external bearings. Such bearings may be local land marks or cardinal directions which in most communities are defined in reference to the solar compass, prevailing wind patterns, river drainage (Levinson *ibid*). A figure's location is therefore identified with respect to a ground object in reference to coordinates provided by the environment. Depending on the nature of the arrangement, the right allocentric term would be picked.

The absolute system has been used to refer specifically to the cardinal orientation in this study, while spatial description involving physical features has been categorized as the **Landmark orientation**. Heine (1997) describes the absolute orientation as involving spatial description with objects outside the scope of a face to face interaction, independent of the speaker's position. In other cases, the accuracy of such descriptions involve a reference to the speaker's position. Both orientations form **the allocentric system**.

It is worth noting that the idea that areas within Nyanza Province that are 'below' Lake Victoria are generally referred to as South and those 'above' it Central, makes the lake a central physical feature that helps in spatial description. Such use of physical environmental elements form the **Landmark orientation**. According to Heine (1997), the landmark orientation is culturally defined and uses geographical features to instigate spatial description. The Nyanza South-Central differentiation therefore is as a result of both the absolute (cardinal South/Central) and the land

mark (Lake Victoria) orientations. The absolute system in Dholuo however is not as intricate and accurate as the case of the Australian Guugu Yimithirr language. The speakers of Guugu Yimithirr possess a kind of mental map with accurate absolute angles that enable them to know where the cardinal directions lie. They are able therefore to locate and trace locations with near precision

Ordinarily, deictic description would be used by Dholuo speakers to loosely refer to direction / positions of places. Such descriptions are often accompanied by gestures (pointing). In instances where general locations are to be identified then the cardinal terms are likely to be used. Such cases may include description like – *Chieng tuch ugwe* (the Sun rises from the East). *Imbo mar Kenya* (West of Kenya)

2.3. Non Frames Of Reference Spatial Notions

We have so far discussed spatial description that involves use of coordinates and angular specifications. The non-angular category too has sub-classes such as deixis, toponymy and topology. These sub categories make use of coincidence and/ or contiguity to proximate the location of the figure in reference to some ground object .These are briefly discussed below;

2.3.1. Deixis

Deixis involves non-definite description of places, people and things. Deixis majorly employ demonstratives (pointers) as well as pronouns in expressing spatial notions. Kemmerer (2010:141) says that demonstratives have abstract meanings only understood by relating them to context of discourse. Levinson (2003:70-71) explains that deixis mostly contributes to spatial locative description by providing the location for the participant of speech, making it possible to fit in several other sub domains like Frames Of Reference. Example below explain these

17

33) *Jogo* *ni* *kacha*

Those people be (PRES PL) there

(Those people are there)

34) *Nyiri* *miel* *ka*
Ladies be dance (PROG) here

(Ladies are dancing here)

The deictic expressions *kacha* (there) and *ka* (here) indicate the position of the speaker in relation to the referents. The exact position can only be established by considering the context of speech. In as much as deictic expression show location and distance, it does not on the whole overtly give angular specification.

18.

35) *Opira* *ni* *kucho*
 Ball be (PRES) there (farther away)
 (The ball is at the furthest side)

If the above example is to be looked at in context, the location and distance of the ball can be approximated but the exact viewpoint of the speaker may not be easily figured, a clear indicator that angular specification is missing.

Sentence (23) repeated here as sentence (37) for **fig 2.6**, explains deictic use in Dholuo within the relative FOR

Fig 2.6c



19.

(36)
Opira *ni* *e* *bath* *yien* *gi* *koni (pointing)*
 Ball be (PRES) PREP (LOC) beside tree PREP this side
 (The ball is to this side of the tree (pointing))

The figure above presents a scenario where a Luo speaker is presented with the task of describing the location of an object in relation to a ground object that has no inherent part. Apart from the observer using an angular specification that is, *e bath yien* (beside the tree), the speaker uses deictic term *koni* (this side) to make his description clearer and more specific. This use of deixis is always almost naturally accompanied by gestures (pointing.)

In most Dholuo spatial description whether static or involving motion, the use of deixis is almost an obvious facet, being the first option that the speaker considers.

2.3.2. Toponymy

In cases of Toponymy, named locations offer solution to location specification. Toponymy being a branch of onomastic is specific to studies of place names. The names that are culturally or geographically assigned to places are important in locative specifications. A physical feature, or a highway or an industry may be defined and located with reference to the nearest place to it. The following examples illustrate the cases of toponymy in Dholuo.

20

(37) *Nyathino* *lor* *Jwelu*
Kid (DET) alights baobab tree
(That kid alights by the baobab tree)

In the first case, the meaning of *Jwelu*, a baobab tree, has been extended to refer to a place by the highway where a giant baobab tree exists, and is used as a bus stop.

2.3.3. Topology

This involves the study of geometrical properties that do not change under a transformation. Whereas metric angle and distance could be lost, topological properties remain relatively preserved. The notions that majorly define topology are contact, containment, proximity and contiguity. In most cases, topological notions are encoded in closed class morphemes called adpositions. That being the case, Dholuo has a unique way of expressing spatial relationships using topological notions that are not necessarily restricted to prepositions, but a combination of prepositions and adverbs, as well as use of other spatial morphemes (Heine et al 1991, Heine

1997 and Svorou 1994 as quoted in Levinson 2003) that integrate the use of the body parts. This is illustrated through the following examples

21

38) *Mon uso e chiro*
 Women be sell (PRES PROG) PREP (LOC) market
 (Women are selling in the market)

39) *Paka nindo e bwo kitanda*
 Cat be sleep (PRES PROG) PREP (LOC) under bed
 (The cat is sleeping under the bed)

40) *Leso liero e ng'e kom*
 Sheet be hang (PRES PROG) PREP (LOC) back (human) chair
 (The sheet is hanging on the back of the chair)

41) *An oko*
 (1PERS SUBJ) outside
 (I am outside)

Stafford 1997 identifies the locative preposition *e* as being dominant in most Dholuo expression of locations. This can be confirmed from the above example where it is realized that it can either be used alone (39) or together with either adverbs (40) *e bwo* (under) or the body-part spatial morphemes (41) *e nge'* (on the back) to express topological notions. Sometimes a nominal functioning as an adverbial can be used without including the locative preposition as in the case of (42) *oko* (outside)

2.4. Conclusion

The chapter begins with an introduction to the different sub categories of spatial representation. It then narrows down to the reference frames by first providing an insight to the background of the coordinates that makes angular specification possible. The intrinsic, relative and absolute systems are identified as the major subtypes of spatial description that make use of angular

specification. The intrinsic system is characterised by ground objects with parts that are inherent; making it easier for a Dholuo speaker to describe the locations of figures that are at a removed distance. The relative system which is uncommon amongst Dholuo speakers involves the mapping of the speaker's coordinates onto the ground object and describing the locations of figures from the perspective of the viewer. The study also focussed on the absolute system which uses fixed coordinates that are environmentally defined. The use of the cardinal bearing amongst the Luo in referring to places, is culturally defined since the South part is already definite. It is therefore easy to describe the location of places by making references to the definite South. Lastly, the chapter has briefly mentioned the non-angular specification that entails deixis, toponymy and topology with various examples in Dholuo presented and discussed.

CHAPTER THREE

SPATIAL RELATORS

3.0. Introduction

This chapter is divided into two major sections. Section one briefly revisits the types of FOR identifying the predominant one in Dholuo. The second section discusses the types of spatial relators that the Luo employ when expressing spatial relationships. The major question that we seek to answer in the second section is what different aspects of grammar are responsible for expressing spatial relationship in Dholuo

3.1 Predominant Frame Of Reference in Dholuo

3.1.1. Overview

The previous chapter has given us an insight on the nature of the Frames of Reference that a Luo speaker would use in expressing spatial relationships. It has been observed that both the egocentric (relative and intrinsic) and the allocentric (absolute and landmark) systems are employed by the speakers of the Luo language. To single out a particular system as the most predominant in the language would be a little unjust since each system has its area of specific usage in Dholuo. For instance, the allocentric system is specific to descriptions involving fixed bearings /absolute directions and landmark descriptions while the egocentric descriptions revolve around the ego, be it explicitly (relative) or implicitly (intrinsic). However, between the two systems, the egocentric system makes references to familiar objects such as furniture, buildings, home equipment, people and other elements of nature, and is therefore used more often than the allocentric. On this basis therefore it (**specifically the intrinsic FOR**) is the most dominant. The non-angular deictic system, is important too because it is used alongside both the allocentric and egocentric systems in describing spatial orientation

3.1.2. Relationship between the intrinsic and the relative system

As earlier mentioned, this study recognizes Levison's tripartite categorization of intrinsic, relative and absolute systems, but takes a slight deviation by grouping the Frames Of Reference into two major systems as indicated in the preceding section - allocentric and egocentric. Within

the allocentric system are the absolute and landmark sub-systems (details about this would be discussed in the section that follows).

Our interest in this section is to explain why both the intrinsic and the relative sub systems are classified as egocentric. Egocentric system entails all the spatial descriptions that centres on the person. Heine (1997:11) refers to spatial descriptions where items are in close proximity to the speaker or the hearer as the *deictic orientation*. However our categorization focuses more on the origin of the coordinates and the perspective of the viewer than the closeness to the objects in question. **The relative system** is realized when spatial description is made with reference to the location and perspective of the viewer. The speaker's coordinates are directly mapped to the ground objects through reflection, rotation or translation. Through this mapping, such spatial notions like left, right, front back and side are used to accurately identify the location of the figure. **The intrinsic system** on the other hand appears to be more object-centred than it is ego centred. However, the ego could also directly or indirectly be the source of the intrinsic coordinates. For example;

22

42 *Nyathi* *ochung* *e* *nyima*
 Child be (PRES) stand PREP (LOC) 1PER POSS SING SUBJ front
 (The child is standing in front of me)

The above intrinsic description explains a scenario where the ground object doubles up as the ego. This example shows a case where the intrinsic coordinates directly originate from the ego. Cases involving inanimate ground objects too have an implicit mapping of the coordinates from the ego. Even though Levinson (2003:41-42) asserts that the intrinsic facets of objects are conceptually assigned, evidence proves that the ego has a large influence in determining the features of such objects. In most languages, the body part model is used in assigning these features. Consider **example 24** below;

23

43 *Kom* *ni* *e* *pier* *ot*
 Chair be (PRES) PREP buttocks house
 (The chair is behind the house)

The concept of *pier* (buttocks) is transferred from the human body part to the house. This aspect of conceptual transfer depicts egocentrism. Looked at differently, the house is depicted as having an inherent facet called *pier*. When describing the spatial orientation of a figure, *kom* (chair) in this case, with respect to the ‘buttocks’ of the house, then the intrinsic system is evident.

Example25 presents another spatial scene that explains the overlap between the relative and intrinsic systems

24

44 *John ochung e bath gari gi kor kacham*
 John be (PRES) stand PREP (LOC) side car PREP left
 (John is standing to the left of the car)

From a relative perspective, the position of John must be to the left of the car from the speaker’s point of view. If the speaker were to change their position, then the description would be different. From an intrinsic perspective, the leftness or rightness of a car is determined by its canonical orientation. The left/ right sidedness of the occupants is literally transferred and assigned to the car. John’s position therefore remains left irrespective of the speaker’s position. Despite the difference in the conceptualization of ‘left’ by both systems, the underlying factor in both cases is that the ego either directly or indirectly plays a major role in describing the above spatial orientation. From this approach therefore, it is justifiable to categorize both the intrinsic and the relative systems as egocentric.

3.1.3. Dholuo Primary FOR – Intrinsic System

According to (Diessel 2014), many scholars (Carlson-Radvansky and Irwin 1993, 1994; Clark 1973; Lyons 1977; Millerband Johnson-Laird 1976) believe that the intrinsic system is near if not entirely universal. It therefore means that the intrinsic system is almost found in every language. Except for languages like Guugu Yimithirr which do not use it often, most other languages use it to a degree that can be considered predominant. Mopan Maya of Belize (Honduras) for example, uses it as their most dominant system (Levinson 2003). This means that almost all language conceptualize space from an egocentric (body centred) perspectives. The understanding and description of space revolves around the use of body parts.

3.1.3.1 The Body Part Model

Heine (1997:132,133) explains that the body part model is based on two primary entities; humans and animals. The human body part model is referred to as the anthromorphic and the animal one called zoomorphic models. The human/animal bodies serve as conceptual templates for the development of grammatical categories. Some body parts act as templates depending on their size, shape and location within the body while others depend on the function. Consider the following examples;

25

45) *Wi gari*
Head car
(Front of a car)

46) *Wi ot*
Head house
(Top of a house)

47) *Wi liel*
Head ant-hill
(Top of an ant hill)

The body part *wich* (head) has been used in the above example to express three different concepts. In (45), the head refers to the car bonnet. This choice of grammatical template could be on account of function, bonnet carries the engine just like the head harbours the brain. It could also be as a result of the location, the animal head is in the front and so is the car's head. In sentence (46), the position of the head (top most part) on the human body could be the reason for the top of the house to be referred to as head. In Sentence (47), the ant hill top is equated to the human head probably on account of shape (protrusion).

Dholuo seems to use both the zoomorphic [*wi gari* (head of a car)] and the anthromorphic [*wi liel* (head of an ant hill)] models. The choice of either model depends on the nature and similarity of the object in question to the source domain. The table below summarises instances of the body part model use in Dholuo

Table 3.1 (Meaning of Dholuo body part phrases)

Body part	Phrase	Literal meaning	Actual meaning
Ngech (back side)	<i>Nge' tv</i>	Backside of the tv	Back of the tv
	Ng'e lau	Backside of the dress	Back of the dress
Tok (entire human back region from head to feet)	Tok ot	Behind the house	Behind the house
	Tok tv	Behind the tv	Behind the tv
Ich (stomach)	i ot	Stomach of the house	Inside the house
	i aora	Stomach of the river	In the river
Tielo (leg/foot)	Tie yien	Foot of the tree	At the foot of the tree
	Tie got	Foot of the hill	Foot of the hill
Bat (arm)	Bad yien	Arm of the tree	Branch of the tree
It (ear)	It yien	Ear of the tree	Tree leaves
Lak (tooth)	Lak yoo	Tooth of the road	By the road

In trying to understand the body part models, some scholars have suggested that the conceptual transfer takes a metaphorical approach. Metaphorical because the factors that determine the relationship between the source domain and the target domain involving the body part model are similar to those of metaphors. Such similarities include;

In both body part and metaphors;

- Source and target are different
- The nature of the referent partly resembles the body part with which it shares a name
- The source meaning still has more weight than the newly formed term (Heine, 1997:142)

Other scholars such as Levinson however argue that the body part transfer to animate/inanimate objects is due to the perceived internal geometry and has nothing to do with metaphors (Levinson, 1994:834,835) as cited in (Heine, 1997:141). A greater understanding of the reasons

for the use of the body part model in describing parts of the inanimate objects could be more accurate if the morphological process in the language is considered from a historical perspective.

The everyday ordinary conversations in Dholuo (as in most other languages) frequently make use of the body part terminologies. Since the intrinsic system heavily relies on these terminologies in describing spatial orientations, its usage automatically dominates most conversations. This explains its predominance in Dholuo language.

3.1.4. Use of the allocentric system for navigation

As had been indicated earlier, the allocentric system is the primary means of expressing locative notions involving absolute and landmark orientations. The example below explains how the fishermen use directions of stars and winds to locate beaches and piers along the lake shore. In what closely resembles the methods adopted by ancient voyagers, the Luo fishermen have a way of locating the direction and position of the beaches, from deep within the lake. In case of bad weather when visibility is minimal, the use of stars and wind comes in handy especially since mobile telephone network coverage in the lake is mostly unreliable, rendering GPS navigation impossible. The tables below give a summary of the types of winds and stars and the direction of their movement

NB: Refer to chapter one under methodology for a detailed breakdown of the procedure used in the data collection and analysis for this section

Table 3.2 - Winds

Type of Wind	Direction of motion	Time of movement
<i>Tarai</i> (Dry winds)	Towards the East	9 pm to 11 am
<i>Kuus/ kasikasi</i> (strong winds)	From West to East	2 pm to 3 pm
<i>Marimbe</i> (stronger winds)	From N. West to S. East	11 am to 5 pm (utmost twice a month)
<i>Genya</i> (very strong and destructive winds)	S. West to N. East	1 pm to 4 pm (mostly experienced in August)

Table 3.3 - Stars

Type of stars		Direction of motion	Time of movement
<i>Name</i>	<i>Nature</i>		
<i>Oluoro budho</i>	Shines in a bright reddish manner	From East to West	Sets at 8am (present almost daily)
<i>Ratego / Ongolo</i>	Bright and bigger; exist in twos or threes	Rises from the East	Rises at 3 am
<i>Yungni</i>	Shaky, very bright; comes in a pair of threes	From East to West	Seen in May, June and July during the day
<i>Bar owuor</i>	Indicates transition between the night and morning	From East to West	Seen immediately after sun set (everyday)

The fishermen have knowledge of the Cardinal alignment of the shores and beaches from which they set off to their fishing expedition. For instance, along the lake shore may exist several beaches that are kilometres apart. Take the case of *Karungu* and *Sindo* beaches. Both beaches are to the east from within the lake, (*refer to the appendix for the map*). Between *Karungu* and *Sindo* beaches, the former is further south. Suppose two different groups of fishermen leave *Karungu* and *Sindo* beaches respectively and head towards the lake, the general knowledge that both beaches are to the East, proves to be very crucial. With the help of the specific stars (*bar owuor*) or winds (*kuus*) that move from or to the East, the fishermen are able to easily navigate eastwards. Once closer to the shore, their understanding of south/north geocentric alignment would make it possible for the *Sindo* group to move northwards and the *Karungu* group to move southwards, hence locating their original positions of departure. According to the informants, this method is hardly inaccurate.

3.2. Spatial Relators used in Dholuo

Spatial relators are the elements that speakers use in expressing spatial relationships. Such elements, as used in describing spatial scenes, relate the figure to the ground. Prepositions, adverbials and nouns are examples of such spatial elements. Spatial relators are ordinarily used across all sub-types of the frames of references. The frequency of their use in Dholuo however is dependent on the dominance of the sub-system. For instance, more spatial grammatical elements

Table 3.3 below summarises the set of simple prepositions derived from the above sentences

Table 3.4 Simple preposition in Dholuo

Sentence no.	Simple preposition	Gloss	Noun
48	e	at	door
49	e	of	house
50	e	in	world
51	e	on	mat

When used in isolation, the *e* preposition is used to locate positions of a figure which is in contact with the ground object. Spatial relationships that involve contact between the figure and the ground are expressed in topological notions. Topological relationship is an example of non-angular specification. In (51) for example, the cat is said to be sleeping (in contact) with the mat; the same is true for ‘standing at the door’ (48).

3.2.1 Spatial relators in Dholuo as used by the Intrinsic FOR

In reference to angular specifications (intrinsic FOR), the *e* preposition is attached to specific nouns (mostly body-part nouns). Such an attachment gives rise to the complex/ nomino-prepositions. **Table 3.5** below illustrates the derivation of complex prepositions

Table 3.5 - Derivation of complex prepositions in Dholuo

Simple preposition	Body part		Complex /Nomino preposition	
	Dholuo	English	Dholuo	English
e	bwo	between the legs	e-bwo	under
e	wich	head	e-wi	on top of/ above
e	tiend	leg	e-tie	at the foot of
e	nyim	front	e-nyim	in front of
e	bath	side	e-bath	by the side of

The first tenet of cognitive Linguistic theory – the embodiment cognition thesis, posits that the way an individual views and describes the world is largely dictated by their bodily experiences. Humans identify with their physique and use them in association with their immediate

environment to describe events around them. Their feeling and thoughts are linked to their bodily orientation. This assumption explains the use of body parts by Dholuo speakers in coming up with complex prepositions that they use in describing spatial notions under the intrinsic FOR. This is largely possible because the ground objects under the intrinsic systems have basic features from which references to a particular figure can be made. In most cases these features are functionally similar to those of the body parts from which the transfer of meaning is realized. Take the case of a chair in the Luo speech community. The armrest is referred to as *bad kom* ‘the hand of the chair’, the back rest being the *nge’ kom* (the back of the chair), and the foot of the chair being branded *tie kom* (the legs of the chair). The chair therefore possesses a hand, a back and legs because these parts come into contact with the parts of the body that bear these names.

The complex prepositions, *e-wi* (on top of / above), *e-bath* (beside), *e-tie* (at the foot of), *e-nyim* (in front of), and *e-bwo* (under) were derived in a similar manner. For instance, the human head has been functionally equated in speech to the ‘head’ of a house (*wi ot*), ‘head’ of a tree (*wi yien*), ‘head’ of a table (*wi mesa*) etc., On the same note, the meaning derived from the sidedness of the human body is extended to capture that of say- a road, hence *bath yoo* (the side of the road), *bath ot* (the side of a house), *bath gari* (the side of the car) etc. The same applies to *bwo* (between the legs) as in, *bwo mesa-* (under the table), *nyim* (*front of*) as in, *nyim kanisa* (front of the church), *tie* (foot) as the case of, *tie aora* (foot of the river).

A set of examples of spatial descriptions involving complex spatial relators under the intrinsic FOR is presented below; these relators are identified from the sets and explained - focusing on their contribution towards the overall interpretation of the spatial descriptions.

These descriptions are along the horizontal plane.

27

52) *Ogudu ni e tie kom*
 Hat be (PRES) PREP (LOC) foot chair
 (A hat is at the foot of the chair)

53) *Nyaroya wuotho e nyim min*
 Calf be walk (PRES PROG) PREP (LOC) front mother (3 PERS POSS)
 (A calf is walking in front of its mother)

The table below summarises the spatial relators identified from the above examples.

Table 3.6 Summary of Dholuo Spatial relators

Sentence No.		Spatial Relator	Ground Object	Inherent feature of ground objects
52	Dholuo Gloss	e-tie at the foot of	kom the chair	tiend foot
53	Dholuo Gloss	e-nyim in front of	Min the mother	nyim front
54	Dholuo Gloss	e-bath by the side of	ot the house	bath side
55	Dholuo Gloss	e-tok behind	kabat the cupboard	tok behind
56	Dholuo Gloss	e-bath by the side of	yoo the road	bath side
57	Dholuo Gloss	e-mbele in front of	gari the car	mbele front
58	Dholuo Gloss	chien mar behind	tinga the tractor	chien behind

In (52) *e-tie* means **by** the foot of; in (53) *e-nyim* means **in** front of, and in (54) *e-bath* means **by** the side of. Even though the simple preposition *e* is the same, its combination with the nouns makes it acquire different meanings. In (52), *Tiend* literally means leg. Depending on how close the figure is to the ‘leg’ of a table, it can either be at or by the ‘leg’. In this case the hat seems to be closer to the ‘leg’ of the table hence *e-tie* becomes at the foot of. Sentence (53) is slightly different from (52). *Nyim* means front part. Dholuo has a way of distinguishing towards the front (*yo nyim-*), and at the exact front (*e-nyim-*). When the calf in (53) is walking *e-nyim* (in front of) the cow, the speaker is sure that it is walking right before the mother. *Mbele* (*front*) in (57) has the same meaning and is used in the same way as *nyim*. The case of proximity explains the use of *bath* (side) in (54) and (56). Since the speaker is not exactly sure how close to the road Otieno or the sugarcane is, *e-bath* would certainly mean by the side of. Otherwise, *e-bath* would also mean

right on the side of, when used in a different context. Lastly, (58) presents a scenario that is slightly different from the other examples since it does not use *e*. However, its English equivalent behind is the same as that of (55) *e-tok* (behind). Note that *e-tok* (behind) as used in (55) is preferable because the cup board has a definite back from which the location of the cup can be traced. *E-tok tinga* on the other hand would have meant at the back of the tractor, which wouldn't have generated the intended meaning of the speaker. *Chien mar* (behind) is therefore preferred because it denotes a region that extends outwards from the back of the tractor, locating the trench in the process.

From the above discussion, it can be concluded that the nature of the inherent feature of the ground object dictates the meaning acquired by the simple preposition. This meaning in turn influences the general meaning of the complex preposition realized

Along the vertical axis, Dholuo makes use of the intrinsic FOR as presented in the following examples;

28

59) *Paka nindo e-bwo otanda*
 Cat be sleep (PRES PROG) under bed
 (The cat is sleeping under the bed)

60) *Oyala fuyore e-wi yien*
 White ants be fly (PRES PROG) above tree
 (White ants are flying above the tree)

61) *Gilop oliero e-wi mesa*
 Bulb be hang (PRES PROG) over table
 (The bulb is hanging over the table)

62) *Ndiko ni e-bwo laini*
 Writing be (PRES) below line
 (The writing is below the line)

Table 3.7 summarizes the intrinsic FOR examples along the vertical plane.

Table 3.7- summary of intrinsic FOR along the vertical plane

Sentence No.		Spatial Relator	Ground Object	Inherent feature of ground objects
59	Dholuo Gloss	e-bwo under	otanda the bed	bwo downside
60	Dholuo Gloss	e-wi above	yien the tree	wich head/top
61	Dholuo Gloss	e-wi over	mesa the table	wich head/top
62	Dholuo Gloss	e-bwo below	laini line	bwo underside

The nomino-prepositions *e-bwo* (under), and *e-wi* (over/above) are the most commonly used Dholuo spatial relators in describing spatial relationships on the vertical axis - across all the sub types of FOR. In **(59)** *e-bwo* refers to a position extending from the facet (downside) of the ground object (bed). Sometimes, *e-bwo* can as well be used to mean below. In **(62)** the piece of drawing can be located on the underside (below) of the line. Sentence **(60)** and **(61)** have the nomino-preposition *e-wi* but depending on context, it may mean both over and above. The difference in meaning depends on the subjects that precede them. In **(60)**, the choice for above instead of over to describe the flight of *oyala* (white ants) is because of the movement caused by the white ants, as opposed to the stationary *gilop* (bulb) in **(61)** that just hangs over the table.

3.2.2 Spatial relators as used in Dholuo Allocentric (absolute/landmark) system

Since the absolute system is not as widely used in Dholuo spatial descriptive scenes as the intrinsic system, it (the former) is mainly used in describing specific spatial scenes. In such absolute descriptions, there are particular spatial relators that are used. The examples below explain such spatial relators.

(63) *Puotha* *ni* *gi* *piny* *mar* *pidh* *cha*
 Farm (1PER POSS) be (PRES) PREP down PREP hill that
 (My farm is down the slopes of that hill)

(64) *Migori* *ni* *Milambo*
 Migori be (PRES) South
 (Migori is to the South)

(65) *Siaya* *ni* *Nyanduat* *mar* *Bondo*
 Siaya be (PRES) North PREP Bondo
 (Siaya is north of Bondo)

(66) *Nam* *ni* *Imbo* *mar* *Ahero*
 The lake be (PRES) West PREP Ahero
 (The lake is to the west of Ahero)

An adverb - preposition combination [*piny mar* (the lower part of)] in (59) is our spatial relator. It connects the location of the farm by identifying the part of the slope where it is likely to be found. The other commonly used adverb-preposition pairing is *malo mar* (upper part of) which is equally used for spatial descriptions.

Sentences (64),(65) and (66) have other adverbs used for indicating cardinal directions. These adverbs are the major spatial relators used by Dholuo in describing Absolute spatial relationships. In (64), the speaker refrains from mentioning the ground, a common practice, owing to the fact that the figure in question (Migori) is generally southwards, once one is in Nyanza. Sentences (65) and (66) mention both the figure [*Siaya*, *nam* (lake)] and the ground (Bondo, Ahero). The cardinal spatial relators in this case [*Nyanduat* (North) and *Imbo* (West)] are paired with the preposition *mar* (of) to form an adverb preposition combination. The cardinal points, [*Nyanduat* (North), *Ugwe* (East), *Milambo* (South) and *Imbo* (West)] can be used as nouns in Dholuo to express spatial locations. For example;

30

(67) *Adak* *Milambo*
(1PERS SUBJ) stay (PRES) South
(I stay south)

In (67) *Milambo* (South) has both been used to refer to a place as well as a noun spatial relator.

3.2.3 Spatial relators as used in Dholuo Relative system

Some spatial arrangements in Dholuo do require relative interpretation. The following illustrate the same.

Fig 3.1



Fig 3.2



Fig 3.3



The above arrangements can be described as follows in Dholuo;

31

Fig 3.1

68) *Kom ni e mbele yien*
Chair be (PRES) PREP (LOC) front tree
(The chair is in front of the tree)

Fig 3.2

69) *Guok ni e tok yien*
Dog be (PRES) PREP (LOC) back tree
(The dog is behind the tree)

Fig 3.3

70)
Opira ni e bath yien kor ka achich
Ball be (PRES) PREP (LOC) beside tree to ART right
(The ball is to the right of the tree)

Dholuo speakers tend to use the relative description in interpreting spatial arrangements involving ground objects with no intrinsic features. The speaker therefore maps their bodily coordinates onto the ground objects under a reflection. Such mappings give rise to the descriptions in (68, 69 & 70) above.

The spatial relators used in the relative descriptions are similar to those of the intrinsic systems. In the above examples, the nomino-prepositions used are; *e-mbele* (in front of), *e-tok* (behind), and *e-bath* (beside). These prepositions relate the figure to the ground, allowing speakers to identify the location of the ground.

The numbers of spatial relators used to describe spatial relationships along the horizontal plane are more as compared to those available for describing the spatial relationship for the vertical plane. Levinson explains this observation with reference to English in that, spatial constructions on the vertical dimension are easily discernible since most objects are viewed as being in an upright stance. In most cases therefore a figure is either placed above or under the ground object.

3.2.4 Further examples involving spatial relators

Other examples how body part derived complex preposition in Dholuo include;

Table 3.8 – Further examples of body part derived complex prepositions

	S P	Body part	Nomino-preposition	Example in a sentence
Dholuo Gloss	<i>e</i>	<i>kor</i> chest	<i>e-kor</i> on the chest of	(64) <i>Olwenda nie e-kor ot</i> The roach is in the wall
Dholuo Gloss	<i>e</i>	<i>tok</i> back of head	<i>e-tok</i> at the back of the head of	(65) <i>Chuodho ni e-tok skol</i> There is mud behind the school
Dholuo Gloss	<i>e</i>	<i>dhok</i> mouth	<i>e-dho</i> by the mouth of	(66) <i>Jogo ochung' e-dho aora</i> Those people are standing by the riverside
Dholuo Gloss	<i>e</i>	<i>lak</i> tooth	<i>e-lak</i> by the tooth of	(67) <i>Maiti oketi e-lak yoo</i> The corpse has been laid at the edge of the road
Dholuo Gloss	<i>e</i>	<i>um</i> nose	<i>e-um</i> on the nose of	(68) <i>Nyathino obedo e-um gari</i> That child is seated on the car bonnet

Table 3.8 presents additional examples where the speakers of a language culturally make use of their bodies to describe spatial notions. The examples in the table present both angular and non-angular spatial notions. In (63) the roach is on the wall. The flat surface of the wall is equated to the flatness of the chest (*kor*). The language therefore transfers the body part meaning and extends it to apply to the wall. *Tok* (back of the head) from (64), has also had its meaning extended to refer to all the areas behind a particular object, in our case, the school. Example (65) has *dhok* (mouth) that means riverside, apparently drawing the comparison between the functional aspect of the mouth (allows entry of food) to that of the riverside (allows entry into the river). *Lak yoo* as used in (66) means right at the edge of the road, a similarity to the sharp edge of a tooth. Lastly, *um* (nose) is the part of the face with a protrusion. Such a protrusion is similar to that of a car bonnet, hence the pairing by a Dholuo speaker.

Lakoff's (1987) assertion that the rest of the body feeds the human brain comes in handy in explaining why Dholuo speakers frequently use the complex preposition in describing spatial notions, especially the angular descriptions. FOR being linguistic makes use of the bodily orientation in describing spatial notions; since linguistic expressions act as avenues or 'windows' to mental constructs, the body-part constructions become part of the thought process; and because an individual's feeling and thoughts contribute to how they interact with their environment, the whole process in the end shapes up an individual perception of the environment around them. This gives a glimpse of the neo-Whorphan hypothesis (a person's language influences their world view.)

3.3 Conclusion

This chapter focussed on two core areas of the study. First was to identify the Predominant sub type of Frame of Reference that Dholuo speakers employ in describing spatial relationships. The study explains that the absolute FOR is predominantly used in describing absolute spatial scenes. While such arrangements are available in Dholuo language, they do not account for large chunk of spoken Dholuo. On the same note, the study revealed that there are circumstances that require a Luo speaker to give a relative interpretation to a spatial arrangement. Such employments of relative FOR are not common in the language. It therefore means that the most commonly used FOR in angular spatial locative description is the intrinsic FOR, making it the Primary system used by Dholuo speakers. The study also found out that, majority of other scholars concur that

the Intrinsic system is a ‘near universal’, that is, it is predominantly used in most other languages in the world just like in Dholuo.

The second major area of focus for this chapter was to identify the spatial relators used by Dholuo speakers in angular and non-angular locative spatial descriptions across all the sub-types. It was noted that non-angular spatial description systems like topological notions, make use of the simple preposition *e* by itself, in expressing spatial relationships. Such relationships involve the ground objects and the figure coming into close contact or contiguity. The study however revealed that Dholuo relative and Intrinsic FOR systems use a combination of the locative preposition *e* and a noun [a facet (part) of the ground], forming complex prepositions or nomino- prepositions, as the spatial relators. In the absolute, a combination of a preposition – adverb/noun pairing give rise to the spatial relators. Along with this was the study’s analysis of how the Dholuo language transfers the body part features in deriving the complex- prepositions that the speakers use in describing spatial notions. The chapter finally closes by giving an insight on the possible influence of the heavy reliance of the bodily derived terms to the speakers’ thought processes, a glimpse of linguistic relativity.

CHAPTER FOUR

4.0. LINGUISTIC RELATIVITY – THE CASE OF DHOLUO

4.1. Introduction

Following experimental tasks conducted in other languages like Mopan (Maya), our study attempts to adopt the methodologies used to investigate the same concept of correlation between language and non-linguistic tasks in Dholuo. These experiments are designed specifically to yield particular hypothesized outcomes that are synonymous with those who predominantly use intrinsic FOR such as Dholuo. The outcomes are then contrasted with the results from other languages like English (US) which predominantly use the extrinsic (relative) FOR.

The study is divided into three sections. Section one discusses the *Animal-in-a row task*. This experiment is similar to the one used by (Brown & Levinson, 1993; Pederson et al. 1998; Danziger 2011; Levinson et al 2002). Our study uses both the three and four animals (separately) and includes an additional cue in the form of ‘a house’ that forms part of the spatial array. The experiment was conducted in two versions. The results of both versions of the experiments are presented, followed by detailed discussions.

The second section introduces *the Mirror image task* (Palmer, 1977; Verhaegen and Kolinsky, 1991; Danziger, 1993) as cited in (Danziger 2011). This experiment entails printed shapes on cards that are mirror images of each other and the participant’s task is to gauge whether these images are the same or different from their counterparts. Palmer’s experiment uses blocks of Lego DUPLO- a building toy for children to build mirror images that are presented to the participants to judge their similarity or difference. The results of this experiment too are highlighted and discussed. A comparison amongst languages where the mirror image task has been conducted (Mopan, US English and Dholuo) then concludes the section

The final section is the conclusion that recaps the points of the entire chapter.

4.2. Animal-in-a-row experiment

This experiment was conducted in two versions, the first with an array of three toy animals only and the second with an array of four toy animals and an additional orientation cue in the form of a toy house. (Refer to the methodology in chapter one section one of *the third field research for a detailed breakdown of the procedure*)

4.2.1. Whorphan Prediction

The study hypothesized that since Dholuo has both the relative and the intrinsic FOR, the two should both be used for conceptual coding. However, since Dholuo predominantly uses the intrinsic frame of reference, the three animals' task would reveal an arrangement that disregards the left-right relationship though it fails to differentiate between the intrinsic and the absolute encodings

The four animal task, under 90 degree rotation, with the increased memory load would reveal an arrangement wholly cued by 'the house' thereby not only disregarding the right –left alignment but maintaining the internal arrangement of the array - accurately reflecting the intrinsic system.

4.2.2. Results

First version

In this version, the number of toy animals used was three. There was no orientation cue.

Table 4.1 presents the response for Participant 1, after a 180 degree body rotation.

Table 4.1- Animal in a row task - response 1

Trials	Arrangement of array	Ordering	Sequence of animals
	Participant 1		
T1	<i>Experimenter (stimulus table)</i>	R 2 L (animals facing left)	Horse, bird, squirrel
	Participant (recall table)	L 2 R (animals facing right)	Horse, bird, squirrel
T2	<i>Experimenter (stimulus table)</i>	R 2 L (animals facing left)	Bird, horse, frog
	Participant (recall table)	L 2 R (animals facing right)	Bird, horse, frog
T3	<i>Experimenter (stimulus table)</i>	L 2 R (animals facing right)	Squirrel, frog, horse
	Participant (recall table)	R 2 L (animals facing left)	Squirrel, frog, horse

NB: *L 2 R means left to right; R 2 L means right to left*

Note1: The term *manner/order(ing)* has been used to mean the left to right or right to left direction that the toy animals faced. For example, in trial 1, the horse was placed at the experimenter's extreme right; to the left of the horse was the bird with its tail at the horse's front; and finally the squirrel at the furthest left and front of the array, its tail to the bird's front.

Note2: The term *general orientation* has been used to mean the eastwards or westwards direction that the animals faced. For instance, in trial 1, the experimenter arranged the animals from right to left (as described above) but the whole array faced to the east. After a 180 degree rotation, the participant in turn changed the order by arranging the animals with the one at the back (horse) being to their left, followed by the bird and the one to the front (squirrel) being to the participant's right. **However, the participant's array like the experimenter's faced east too.**

Note3: *Sequence* as used here means how the animals followed each other. For example, in Trial 1, the experimenter put the squirrel at the front, followed by the bird and the horse at the rear. The participant in their reassembly did the same. In Trial 2, the experimenter placed the frog at the front followed by the horse and the bird at the back. The participant too placed them in a similar sequence.

Note4: *Facing right or facing left* means facing right/left of the experimenter/participant

The stimulus arrangement in Trial 1 was in a right to left ordering. The recall table was at 180 degrees to the stimulus table. After a complete 180 degree body rotation, the participant reassembled the construction in a left to right order maintaining both the sequence of the animals (horse, bird, squirrel) and the general orientation of the array similar to that of the stimulus. Trial 2 is similar to Trial 1 except for a difference in the sequence of the animals (Bird, horse, frog). In Trial 3, the stimulus arrangement was in a left to right manner. After a 180 degree body rotation, the participant reconstructed the spatial array replicating the general orientation of the stimulus while adopting a right to left ordering. The sequence of the animals too was maintained. Except for participant 8 who had a problem recalling the right sequence of animals, the responses for all the other four participants (3, 4, 5, &7) maintained the sequence of the animals as well as the general orientation similar to that of the stimulus array- an indicator that the internal arrangement of the array is impervious to rotation sensitivities.

Table 4.2 presents the response for Participant 6, after a 180 degree body rotation.

Table 4.2 - Animal in a row task - responses 2

	Arrangement of array Participant 6	Ordering	Sequence of animals
Trial 1	<i>Experimenter (stimulus table)</i>	L 2 R (animals facing right)	Horse, squirrel, bird
	Participant (recall table)	L 2 R (animals facing right)	Horse, squirrel, bird
Trial 2	<i>Experimenter (stimulus table)</i>	L 2 R (animals facing right)	Bird, horse, squirrel,
	Participant (recall table)	L 2 R (animals facing right)	Bird, horse, squirrel,
Trial 3	<i>Experimenter (stimulus table)</i>	R 2 L (animals facing left)	Horse, bird, squirrel,
	Participant (recall table)	R 2 L (animals facing left)	Horse, bird, squirrel,

NB: *L 2 R* means *Left to right*; *R 2 L* means *Right to left*

In trial 1, the experimenter arranged the stimulus in a left to right ordering. After a 180 degree body rotation, the participant reconstructed the array in a similar left to right ordering just as the stimulus array, maintaining left – right relations. Even though the left to right ordering of the animals was maintained, the general orientation of the stimulus array was reversed. Trial 2 was similar to Trial 1 except for the sequence of animals (Bird, horse, squirrel). Trial 3 had the stimulus arranged in a right to left ordering which was replicated at the recall table by the participant after a body rotation of 180 degrees, in a similar right to left order, maintaining the relative left-right relations. The general stimulus orientation was reversed but the sequence of animals (horse, bird, squirrel) was maintained by the participant.

Second Version

In this version, the number of animals used was increased to four; however, the participant was expected to make an arrangement of three animals. An additional orientation cue in the name of a house was also used as part of the array. The first four participants reconstructed the spatial arrays after a 180 degree body rotation while the last four did the same under 90 degree rotation. The two tables below summarize the results

Table 4.3 presents the response for Participant 1 (of the second version), after a 180 degree body rotation.

NB: The house was to the *farthest right* or the *farthest left* of the array whether on the stimulus or on the recall table

Table 4.3

	Participant 1	Arrangement of array	Pos of house	Ordering	Sequence of animals	Orientation from house (Where animals face)
T1	Experimenter (stimulus table)		Right	L 2 R	Horse, squirrel, bird (frog)	Facing house
	Participant (recall table)		Left	R 2 L	Horse, squirrel, bird	Facing house
T2	Experimenter (stimulus table)		Left	R 2 L	Bird, squirrel, frog (horse)	Facing house
	Participant (recall table)		Right	L 2 R	Bird, squirrel, frog	Facing house
T3	Experimenter (stimulus table)		Left	L 2 R	Horse, squirrel, frog (bird)	Away from house
	Participant (recall table)		Right	R 2 L	Horse, squirrel, frog	Away from house

NB: L 2 R means Left to right; R 2 L means Right to left

T1 means Trial 1; T2 means trial 2; T3 means Trial 3

In the first trial (T1), the experimenter placed the house on the right at the stimulus table and on the left at the recall table. The recall table was at 180 degrees to the stimulus table. The stimulus array of animals faced the house, in a left to right ordering. The same construction was reassembled by the participant in the recall table who equally placed the array, after a rotation of 180 degrees, facing the house on a right to left order. In T2, for the stimulus table the house was placed on the left while on the recall table, the house was placed to the right. The experimenter placed the stimulus array facing the house, in a right to left order. The participant had a similar arrangement, maintaining the internal arrangement of the array with the animals facing the house, on a left to right ordering after a 180 degree rotation. T3 had the house placed on the left at the presentation table and on the right at the recall table. Just like in T1, the experimenter placed the animals to face away from the house on a left to right ordering. The participant maintained the internal arrangement under 180 degree rotation by placing the animals to face away from the house but this time on a right to left direction.

Table 4.4 presents the response for Participant 5 (of the second version), after a 90 degree body rotation.

NB: The house was to the *farthest right* or the *farthest left* of the array whether on the stimulus or on the recall table

Table 4.4

	Arrangement of array Participant 5	Pos of house	Ordering	Sequence of animals	Orientation from house (Where animals face)
T1	Experimenter (stimulus table)	Left	L 2 R	Frog, squirrel, horse (bird)	Away from house
	Participant (recall table)	Left	L 2 R	Frog, squirrel, horse	Away from house
T2	Experimenter (stimulus table)	Left	R 2 L	Squirrel, frog, bird (horse)	Facing house
	Participant (recall table)	Right	L 2 R	Squirrel, frog, bird	Facing house
T3	Experimenter (stimulus table)	Right	R 2 L	Frog, bird, horse (squirrel)	Away from house
	Participant (recall table)	Right	R 2 L	Frog, bird, horse	Away from house

NB: L 2 R means Left to right; R 2 L means Right to left

T1 means Trial 1; T2 means trial 2; T3 means Trial 3

For the first trial (T1), the experimenter placed the house to the left both at the stimulus and the recall table. The recall table was at 90 degrees to the stimulus table. The stimulus array of animals faced away from the house, in a left to right manner. The same was replicated by the participant who equally placed the array, after a rotation of 90 degrees, facing away from the house on a left to right manner. In T2, for the stimulus table the house was placed on the left while on the recall table, the house was placed to the right. The experimenter placed the stimulus array facing the house, in a right to left direction. The participant had a similar arrangement, maintaining the internal arrangement of the array with the animals facing the house on a left to right orientation. T3 had the house placed to the right at both the presentation and the recall table. Just like in T1, the experimenter placed the animals to face away from the house on a right to left direction. The participant maintained the same order (the animals facing away from the house)

with the front one (horse) being to the left and the one at the back (frog) being to the right close to the house, all under rotation.

The remaining three participants (2,3,4) had similar pattern of responses to the two highlighted above, in terms of the left/right order of the array, the general orientation from the house as well as the sequence of the animals. The same is true for participants (6, 7&8) even though they rearranged the spatial array under 90 degrees rotation as opposed to the 180 degree rotation of the first four.

4.2.3. Discussion

First version

Participant 1 and six other participants out of eight reconstructed the array according to the Whorfian prediction for speakers with intrinsic FOR as the most predominant. The participants in their reconstruction under 180 degrees rotation did not consider the left-right relations of the array as would have been in the case of predominantly relative FOR speakers. The intrinsic encodings by nature could take any direction, but in this case, the encoding must have been oriented by local factors like the table axis or the alignment of the wall of the room. As a result they maintained the internal structure of the array by focussing on the general orientation (eastwards/westwards) of the animals and the sequence in which they were arranged, that is to say, the squirrel is in front of the bird, and the horse is behind the bird for a (horse, bird, squirrel) array.

Unlike the other participants, the sixth participant rebuilt the array in the new visual space while observing the left-right relations. Like the rest of the seven participants, she maintained the sequence of arrangement of the animals but unlike the others, she maintained the left-right relationships while under rotation, for all the three trials. The participant therefore employed the relative frame of reference in solving this particular task. It should be noted that a Dholuo speaker typically has both the relative and the intrinsic reference and therefore the participant's choice of the relative FOR to solve a non-linguistic task is surprising but not unexpected.

Not counting participant six, it is clear that the responses of participants 1, 2, 3, 4, 5 &7 to the experiment above shows a preference for the intrinsic but a bias against the relative Frame of

Reference for Dholuo speakers. However, the responses do not satisfactorily distinguish between the absolute and intrinsic FOR encodings. A participant who uses the absolute Frame of Reference encoding to solve a non-linguistic task like reconstructing an array under rotation should maintain a north- south relationship of the array in the new visual space. Both the absolute and intrinsic encodings are impervious to the left-right relations of the array. It would be argued that the outcomes of the six participants would as well be as a result of the absolute FOR encodings.

Second Version

For a purely intrinsic encoding to be realized, the *Animal-in-a- row* experiment has to be modified first by increasing the memory load of the participants. By increasing the number of the animals to four instead of three, the participant is exposed to an additional task of identifying the animals besides the mastering the sequence and the left/right direction of the array. This in essence increases the participants' load on recall memory as well as masking the experimenter's intentions in the orientation of the array. It is predicted that an increase in the memory load of the participant would naturally incline them into using their (Dholuo speakers') natural and habitual intrinsic way of coding things.

The second modification to the *Animals- in -a row* experiment is in the additional use of the orientation cue in the form of 'a house'. The 'house' in this case would cue the array such that the animals would face either towards or away from it. **Table 4.3** indicates the response for participant 1 who re-assembled the spatial array under 180 degrees rotation. The direction that the array takes (whether towards or away from) the house takes prominence in the participant's responses for the three trials and just like in the first version, the left-right relationship of the array is disregarded.

Despite the two modifications, the final reassembled array from the participants could still not explicitly indicate whether the participants were thinking of 'animals facing towards or away from the house' or they figured out that 'the animals faced north/south'. A third modification therefore was necessary to dispel 'the animals facing north/south' notion. The 'orientation free' nature of the intrinsic arrays was therefore employed. The rotation of the array was done under

90 degrees and not 180 degrees as was for the last four participants. The reasoning behind this is that an array that is encoded intrinsically preserves its internal arrangement (facing towards or way from the house). An absolute encoding would similarly align to the orientation like that of the intrinsic under a rotation of 180 degrees. If the recall table is put under 90 degrees rotation to the presentation table, the absolute encodings of the array would tend to maintain the north-south relationship. An absolute encoding of the array would therefore require a sagittal alignment away from the participant. The intrinsic encodings of the array however would tend to preserve its internal arrangement by facing away or towards the house placed along a left-right axis

Table 4.4 presents the response of *participant 5* generated under 90 degrees rotation after three trials.

It is evident from the responses from **Table 4.4** and for the other three participants that the intrinsic encodings are based on array- internal relationships which make them impervious to rotation of the whole array. The response under the 90 degree rotation also present the most accurate result which confirms that Dholuo speakers use intrinsic encodings to solve non-linguistic cognitive tasks. This is in line with the Whorfian prediction for predominant users of the intrinsic Frame of reference.

4.3. Mirror image experiment (*Palmer's task*)

In this task, a pair of 3D objects is presented to the participants. The researcher manipulates the shapes of the DUPLO 3D objects to come up with an identical, mirror image and bad match shapes between the pair. They are encouraged to gauge whether the pair are different, or not different from one another. (*Refer to the methodology in chapter one section two of **the third field research** for a detailed breakdown of the procedure*)

4.3.1. Whorphian prediction

The study expects that the participants should treat the bad match as *opogore* (different) and the mirror image shapes as well as the identical shapes as *chalre* (not different). The focus is on the participant's classification of the mirror images as identical as is expected of predominant intrinsic language users, and to test if there is an interaction between the spatial conceptualization and habitual language use.

4.3.2. Results

Table 4.6

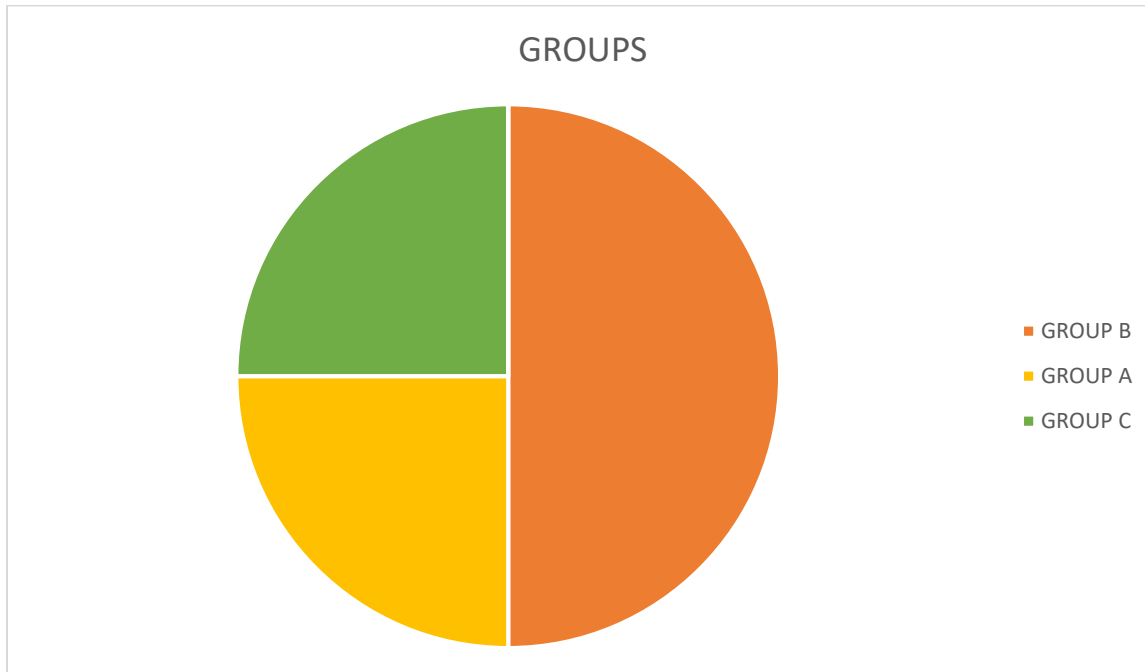
	Group A	Group C		Group B
No. of times mirror images classified as identical	0	1	2	4
Participant 1	X			
Participant 2				X
Participant 3	X			
Participant 4			X	
Participant 5				X
Participant 6				X
Participant 7		X		
Participant 8				X

Every participant was presented with ten trials that is, 3 bad matches, 3 identical images and 4 mirror images in a randomized order. **Table 4.6** above highlights the responses for the participants on the mirror images. Two participants were replaced since they classified the bad matches as identical even after an initial training. The group that proceeded to the actual trials all correctly identified the bad matches as different and the identical matches as similar.

We have placed all the participants in groups according to how they classified the objects. For all the participants who had classified zero mirror images as similar we place them in Group A (Participant 1 & 3). Group B entails those participants who judged all the four mirror images as similar (Participants 2, 5, 6 & 7). Group C comprises of all the participants who judged some mirror images as similar while others as different (participants 4, &7)

The responses per group are presented in the pie chart below

Fig 4.1- group responses on mirror images



Group A classified all the bad matches and the mirror images as different and classified the identical images as similar. The example below indicates the interaction between the experimenter and Group A participants;

32

72) **Experimenter (Mirror image):** *gigi chalre koso opogore?*

(Are these similar or different?)

Grp A participant: *gipogore*

(They are different)

73) **Experimenter (identical image):** *gigi chalre koso opogore*

(Are these similar or different?)

Grp A participant: *magi to chal*

(These are indeed similar)

One observation about the Group A participant is that they took their time before responding. They held the objects and inspected them closely. One of them even requested the experimenter

to show him another pair of objects before responding to the immediate one. When they gave their response, it was with a sense of conviction and certainty.

Group B classified both the identical and the mirror images as similar and correctly classified the bad matches as different. Below is a sample interaction between the experimenter and Grp B participants

33

74) **Experimenter (identical image):** *gigi chalre koso opogore*

(Are these similar or different?)

Grp B participant: *magi chal*

(These are similar)

75) **Experimenter (Mirror image):** *gigi chalre koso opogore?*

(Are these similar or different?)

Grp B participant: *magi be chal*

(They too are similar)

As opposed to Grp A, these participants were quick and apt in their responses. One was slightly hesitant in his response but others exuded confidence in their decisions. One group B participant had this response (76) when presented with a mirror image immediately after being presented with an identical image

34

76) **Experimenter (Mirror image):** *gigi chalre koso opogore?*

(Are these similar or different?)

Grp B participant: *magi be chal en mana ni ging'iyore*

(These too are similar though they face each other)

Group C classified one or two mirror images as identical, classified all the identical images as similar and all the bad matches as different. One notable observation about this group was that for the instances that they classified the mirror images as similar, those (mirror images) were the first in the trials out of the ten. The mirror images that were presented as the last or near last were classified as different.

4.3.3. Discussion

It is predicted that language speakers who predominantly use the intrinsic FOR as opposed to the heavy extrinsic FOR users, do classify 3D mirror images as identical. Danziger (2011) explains that the tendency to classify mirror images (whether 2D or 3D) by intrinsic users as similar is in most part intuitively driven. The ability and inability to distinguish mirror images by extrinsic and intrinsic FOR users respectively, has a proven experimental backing. It is on this experimental background realized from a number of languages (Levinson and Brown, 1994; Danziger, 1999) as cited in (Danziger 2011), that our study adopted a similar task. The above experiment should have therefore revealed accurately the predominance of the intrinsic FOR usages amongst Dholuo speakers. However the results of our experiments only partially reflect Danziger's prediction. A number of explanations towards the same have been put forward.

First is in reference to Group A participants whose responses went against the Whorfian prediction of the predominant intrinsic FOR users. This group of participants carefully analysed both objects before giving their verdict. The careful consideration could be due to the apparent confusing nature of the objects that appeared to be similar. One explanation would be that since Dholuo speakers have both the relative and intrinsic FOR for use but readily employs the latter for encoding ordinary tasks, the participant's first impression might have been that the mirror images were identical. Upon closer inspection, the less habitually used relative FOR must have played a hand in distinguishing the two objects. This explains the lengthy time frame that these participants took to make their judgements

The Group A response can be contrasted to the responses that their Group B counterparts came up with. From their apt responses, it can be concluded that these participants used the FOR that were immediately available to them (intrinsic) and quickly figured out that the objects were identical. An interesting scenario is realized when one of the participants admits that even though the mirror image objects face each other, that does not make them different- a sign that an intrinsic interpretation maintains the internal arrangement and is impervious to difference in direction.

Responses from Group C confirm the argument that we have put forward. When the mirror images were first on the list of trials, the participants judged them to be identical. After further

interactions with identical images, they judged the other mirror images as different. The immediacy of use of the intrinsic interpretation is evident just as the employment of the extrinsic interpretation is obvious after familiarity with actual identical images.

Levinson and Brown (1994) point out that logical formulations for the reason behind the apparent inability of intrinsic dominant language users to differentiate mirror images may be problematic. Referring to outcomes from the Tzeltal speakers of the Maya, who use both the intrinsic and extrinsic FOR, they conclude that for such groups of people, the mirror image distinction has no proven cognitive bearing. Since Dholuo, just like Tzeltal employs both the extrinsic (to a smaller scale) and intrinsic FOR, Levinson’s observation may hold some water. Despite the argument presented in the Dholuo case above, explaining how the mechanisms by which speakers switch from extrinsic to intrinsic encodings and vice versa, is related to conceptualization may be hard to prove.

4.3.3.1. Comparison between Dholuo, Mopan & US English Speakers

Since the same experiment was conducted amongst the Mopan of the Maya community as well as amongst a group of US English speakers (Danziger 2011), it would be prudent to compare the outcomes of both experiments for a more conclusive generalisation to be arrived at. **Table 4.6** summarizes the responses

Table 4.6

No. of times mirror images classified as identical	0, 1 or 2	3, 4 or 5	Total
Mopan	9	5	14
Dholuo	4	4	8
US English speakers	24	0	24
Total	37	9	46

All the participants from the three languages could be considered literate. The 14 self-declared literates from Mopan had at least some elementary education. The 8 participants from Dholuo were between grades 6 to 8 in Kenyan Primary school. The US English Speakers were almost all college students.

In terms of age, the Mopan participants had an age range of between 22-60, the US college students ages ranged from 18 – 30, while the Luo participants had ages between 13 and 17 years. The Mopan participants comprised of 13 female and one male, the Luo participants were 4 males and 4 females while the US volunteers were 12 males and 12 females

The following graph summarizes the comparisons amongst the three languages

NB: the vertical axis represents the number of participants

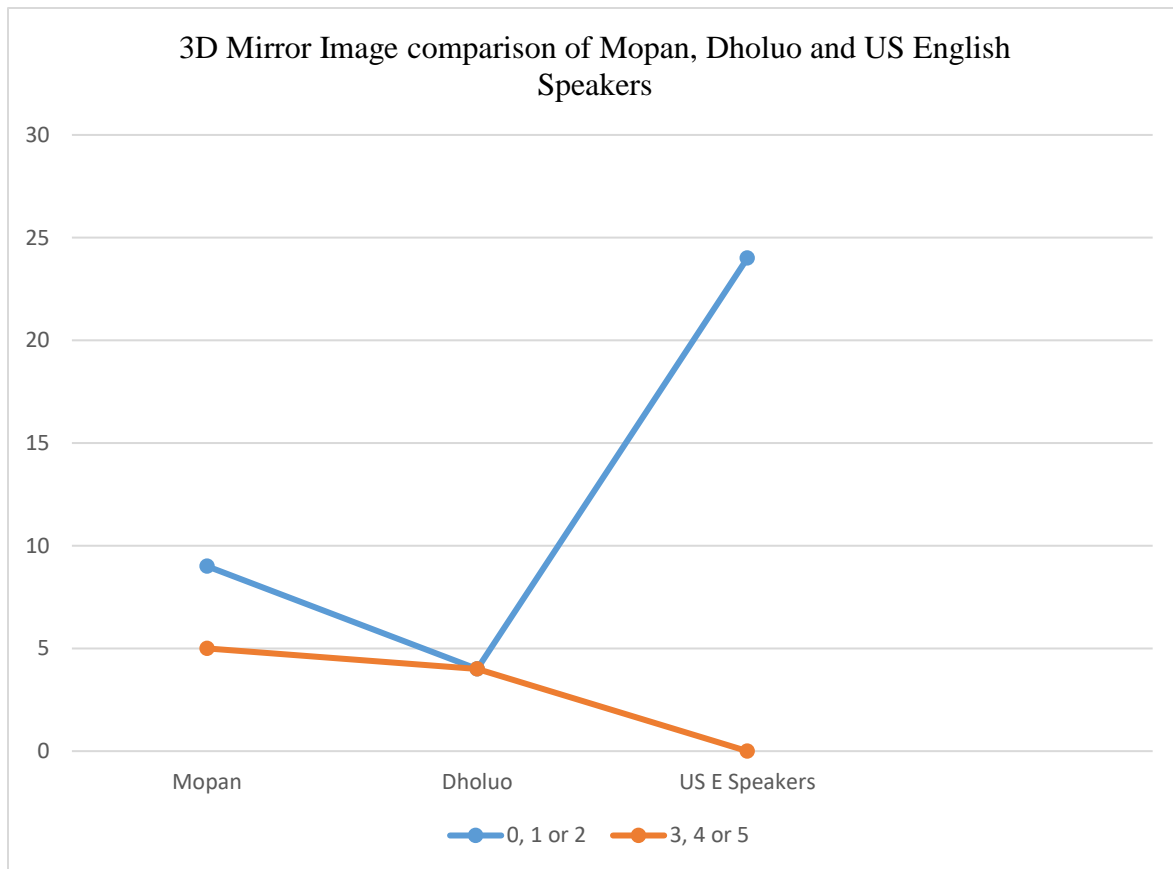


Fig 4.2

The blue line from the graph indicates the respondents who classified between 0 to 2 mirror images as identical. Majority of the Mopan participants (9) classified the mirror images as identical the least number of times that is once or twice. Half of Dholuo participants classified either 0, 1 or 2 of the mirror images as identical while all the US English speakers fell under the 0, 1 or 2 group, which is they classified no mirror image as identical. The orange line represents the mirror images that were classified more than twice. Five out of fourteen Mopan participants

classified 3 or more mirror images as identical. Four Luo participants (half) classified 3 or more mirror images as identical while no US participant fell in this group. From the graph, out of the sampled population, Mopan had 38%, Dholuo 50% and US English speakers 0% of participants classifying mirror images as similar. It should be noted that just like Dholuo, Mopan too has both the relative and intrinsic FOR even though they predominantly use the Intrinsic FOR. In English however, the most dominant FOR is the relative with a few instances of intrinsic interpretations.

From the comparison of the three languages, it can be deduced that the preference in how languages classify mirror images has much to do with the culture of the speakers, of which language is embedded. The perception from other quarters that there is a universal manner in which speakers of all languages classify mirror images and that any difference is as a result of different individual visual systems, is therefore fallacious.

When both the intrinsic-dominant languages like Dholuo and Mopan are compared to English (US), it can be argued that unlike English whose heavily extrinsic interpretation makes it easier for the speakers to distinguish the mirror images, the case is not true for the other two. Even though Mopan does not share the same cultural set up as Dholuo, their common intrinsic FOR dominant aspect which starkly contrasts with the heavily extrinsic FOR presence in English explains their tendency to classify mirror images as identical.

The disparity in outcomes of the experiment between Dholuo (50%) and Mopan (38%) can be attributed to the difference in sample size between the two experiments. However, it can authoritatively be stated that the intrinsic nature of a language plays a role in the speakers' preference to classify mirror images as identical.

Danziger (2011) admits that the major problem that faces the Neo-Whorfian hypothesis as far as the above experiment is concerned has got to do with the fact that a logical explanation that ties the outcomes of the experiment to conceptual relations has proved problematic to empirically test.

4.4. Conclusion

In this chapter, the study seeks to determine the relationship between Dholuo linguistic encodings and the non-linguistic cognitive tasks, an aspect that is referred to as Linguistic determinism. Linguistic determinism is closely tied to linguistic relativity which broadly refers to the influence that aspects of a particular language has on a speaker's interpretation of their environment. This principle is popularly known as the Neo-Whorfian hypothesis.

The chapter discusses the two tasks - *Animal-in-a row* and the *Palmers mirror image* as was realized amongst Dholuo participants. Both the *Animal-in- a row* and *the mirror image* experiments confirm that the FOR which speakers of Dholuo habitually use in their everyday interaction is the Intrinsic FOR. These experiments also prove that Dholuo speakers employ the predominant intrinsic FOR in solving simple cognitive tasks such as reassembling an array and object differentiation. These results are compatible with the Whorfian hypothesis which states that aspects language that are habitually used may be reflected in conceptual encodings.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMENDATION

5.1. Summary

The study has used the embodied thesis (within the cognitive semantic approach), the body part model and the Neo- Whorfian Hypothesis to investigate and discuss the Frames of Reference in Dholuo. In adopting these theoretical frameworks, the research has majored in key aspects of the Frames of Reference in Dholuo amongst them; the types of FOR, the grammatical categories through which these FORs are conveyed within language and the relationship between the dominant FOR and its usage in non-linguistic cognitive faculties.

5.2. Conclusion

The findings of the study indicate that Dholuo has all three FOR. Whereas the Intrinsic FOR is the most widely used by speakers, the relative FOR is restricted to describing spatial scenes that involve unfeatured ground objects such as a tree. The allocentric system is specific to description that involves both cardinal orientation (absolute frame) and landmark features. The absolute system is employed by Dholuo speakers in instances where references are made to general spatial descriptions such as the direction of the setting/rising sun, references to common places like Towns and use by navigators. The landmark system is primarily used in describing spatial scenes that involve the presence of physical features such as a lake, hill, a cathedral or a town tower. The study further concludes that out of the three FORs, Dholuo speakers predominantly use the intrinsic system. The body-part naming system available in the language plays a crucial role in the speakers' preference for an intrinsic interpretation of the everyday spatial scenes. The speakers are able to transfer their body part configuration to the featured parts of objects whose location they spatially describe.

Another revelation is that each FOR has specific grammatical categories that it uses to spatially describe scenes. The intrinsic system makes use of the *nomino* preposition- a complex preposition that is realized from a combination of the simple preposition *e* and a body part. Since the intrinsic system is the most dominant, the most common grammatical category used by Dholuo speakers in describing space is the **nomino preposition**. The allocentric frame [the system that makes use of the cardinal features and landmarks (absolute and landmark

orientations)] uses an adverb-preposition pairing such as *piny mar* (lower part of), and *malo mar* (upper part of) in describing spatial scenes in Dholuo. Other commonly used adverbials are the cardinal terminologies such as *Milambo* (South), *Imbo* (West), *Nyanduat* (North) and *Ugwe* (East).

Lastly, through the *Animal-in-a row* experiment and the *Palmers mirror image task* there search found out that Dholuo's predominant Intrinsic FOR has some bearing in solving non-linguistic spatial tasks such as rearranging of a spatial array. The speakers employ an intrinsic interpretation in tackling such tasks. This outcome confirms the Neo-Whorfian claim that aspects of a language can be traced in non-linguistic domains thereby influencing a speaker's perception of the environment (world view)- a concept referred to as **the relativity hypothesis**.

5.4. Recommendation

The spatial notions investigated in this study were specific to the coordinate system which involves angular description. Even within this domain, our study was restricted to the static locative descriptions. Notions that involve motion descriptions have not been considered. This therefore is a rich area for further research in Dholuo. Besides the coordinate systems, other aspects like the topological notions and toponymy have not been exhaustively researched on in Dholuo and are avenues for future research. Even though there is a considerable amount of literature on deixis in Dholuo, studies that investigate the use of deictic notions in analysing frames of Reference in Dholuo has not been exhaustively undertaken. This too is an opening for future research

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Second Field Research

Researcher's Questionnaire

1. What do you use for navigation when you are in the lake?

2. Do you prefer the use of winds and stars to that of phones?

3. Are the winds and the stars used for navigation in the lake?

4. How do the fishermen use the winds and stars to show direction and positions of the beaches?

5. What are the names of the winds?

6. How do you differentiate between one type of wind and the other?

7. How many types of stars are there?

8. What differentiates one type of star from another?

Appendix two – Map of Nyanza



Map of Homabay County



***Three Animal array. No orientation cue.
Body under 180 degree rotation***

Experimenter: R 2 L (facing left) [horse, bird, squirrel]



Participant: R 2 L (facing left) [squirrel, frog, horse]



Participant: L 2 R (facing right) [horse, bird, squirrel]



Experimenter: (facing right) [Horse, squirrel, bird]



Experimenter: L 2 R (facing right) [squirrel, frog, horse]



Participant: (facing right) [horse, squirrel, bird]



Four (three) Animal array. Participant under 180 degree rotation. House forms part of the array.

Experimenter: (Horse, squirrel, bird- facing the house)



Participant: (bird, squirrel, frog -facing the house)



Participant: (Horse, squirrel, bird-facing the house)



Experimenter: (Horse, squirrel, frog- facing away from the house)



Experimenter: (bird, squirrel, horse - facing the house)



Participant: (Horse, squirrel, frog- facing away from the house)



Four (three) Animal array. Participant under 90 degree rotation. House forms part of the array.

Experimenter: (frog, squirrel, horse- facing away from the house)



Participant: (frog, squirrel, horse- facing away from the house)



Experimenter: (squirrel, frog, bird- facing the house)



Participant: (squirrel, frog, bird- facing the house)



Experimenter: (frog, bird, horse- facing away from the house)



Participant: (frog, bird, horse- facing away from the house)



Mirror image I



Mirror image III



Mirror image II



Mirror image IV



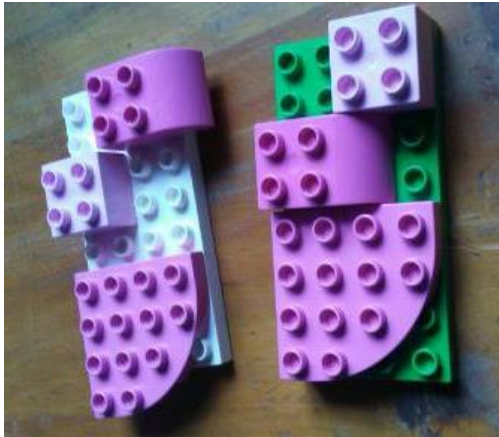
Bad match I



Identical Image I



Bad match II



Identical image II

