

Lexicalization Of Motion Events The In Physical Environments From The Cognitive Perspective In Vietnamese

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Abstract

The present research endeavors to examine the distinct contextual settings of physicality within which motion events are articulated by Vietnamese speakers. The underlying theoretical framework of this study draws upon Talmy's lexicalization patterns, offering a solid foundation for analysis. To investigate this phenomenon, a corpus of motion event verbs was compiled from ten narratives and subsequently subjected to comprehensive scrutiny using the software tools WordSmith and Endnote. The empirical findings of this investigation reveal that within the aerial domain, motion events are primarily expressed through the utilization of path-lexicalized verbs. Conversely, within the aquatic and terrestrial realms, these events are predominantly conveyed by employing manner-lexicalized verbs. To be more precise, Vietnamese speakers exhibit a proclivity towards the use of manner-lexicalized verbs when expressing motion, as opposed to path-lexicalized verbs. It is hoped that this study will make a valuable contribution to the field of Vietnamese linguistic typology by dissecting the semantic attributes inherent in these two distinct categories of motion verbs.

Keywords: *Lexicalization, Manner-lexicalized, Path-lexicalized, Physical environments*

1. Introduction

Understanding objects and their movements is one of the earliest and foundational cognitive achievements in infants. Moreover, motion is an intrinsic and fundamental aspect of human experience, captivating individuals from their very first day of life. Consequently, the concept of motion has been expressed in diverse manners across different languages. Leonard Talmy has conducted extensive research on the phenomenon of motion events. In his efforts to classify languages, Talmy (1985, 2000) categorized them into two groups: verb-framed and satellite-framed, based on how constituent elements of motion events are represented. In verb-framed languages, the path of motion is encoded within the verb stem, while satellites convey the manner of motion. In satellite-framed languages, the central element of motion is the path, which is expressed through satellites or prepositional phrases, while the verb component represents the central element of manner of motion (Talmy, 2020). Talmy's theory posits two approaches for analyzing the lexicalization patterns of motion events. The first approach involves maintaining a constant surface form (referred to as **Su.F**) and examining its various semantic elements (**Se.E**). The second approach involves keeping a specific semantic element constant, such as running, throwing, or pulling, and studying the surface forms that represent it (Talmy, 2000). After a comprehensive examination of these approaches, Talmy concludes that the relationship between the two elements is not strictly one-to-one. The two approaches can be schematized as depicted in Figure 1.

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Figure 1. Approaches to the study of lexicalization patterns (Ly Ngoc Toan 2019)

The present study employed the second approach, wherein a core surface form (referred to as "going") was maintained while attempting to analyze how verbs in Vietnamese depict motion in spatial relations, as well as the information pertaining to path and manner. Additionally, an investigation was conducted to determine the extent to which Talmy's theory of language classification aligns with the findings of this study. Considerable research has been conducted by scholars on motion events in Vietnamese (Pace, 2009; Han, 2011; Toan, 2019, 2021). Despite the availability of comprehensive studies on the representation of motion events and the semantics of motion verbs, it is challenging to locate a study that specifically examines verbs of motion in spatial relations. Furthermore, the present research distinguishes itself by focusing on the distinctive characteristics of the spatial and physical environments that give rise to different expressions of motion. In order to address this subject, the researcher formulated the following research questions.

1. *How are motion events lexicalized in the physical environments in Vietnamese?*
2. *What are the common patterns of lexicalization for motion events in the physical environments?*
3. *Are there any differences in motion events among the physical environments in Vietnamese?*
4. *What are the semantic characteristics of the motion verbs used in the physical environments?*

2. Background of the study

It is no doubt that the concept of motion has been examined from different aspects and proposed different theories by several linguists worldwide. Fillmore (1966, 1968) provides the definition of the components of motion and the case grammar and a description of the deep structure of verbs. Langacker (1987) analyzes the conceptualization of motion based on the role of time. Jackendoff (1990) delves into the semantic structures of motion verbs through the analysis of the thematic role structure of language and argument structures, etc.,

Being one of the founders of cognitive linguistics, Leonard Talmy has different viewpoints from those that came before it in two ways: first, he uses motion as a method for developing his theory in his lexicalization theory (Talmy, 1985; 2000); and second, he assumes that the motion event is a linguistic representation of a universal category. By examining a group of components that make up conceptual domains such as space, time, place, motion, and force, Talmy attempts to address the question of how language organizes a concept at the general level in his two-volume book *Toward a Cognitive Semantics* (Talmy, 2000). He explores the connection between form and meaning in the second volume of this book and theorizes that lexicalization is the systematic reliance of a semantic component on a morpheme (Talmy 2000).

It is Talmy's theory of lexicalization that has given rise to a vast number of studies that investigate motion in a great number of aspects. Slobin (1996, 2004) analyzed the representation of the motion event in various languages by using a comparative method and published his findings in a two-volume book titled *Relating Events in Narratives*. Additionally, Nunez (2007) and Frez (2008) looked at various ways that lexis-level semantic elements are encoded in languages.

Han (2011) conducted a comparative study on the lexicalization patterns of motion verbs in English and Vietnamese, with a focus on the typological and universal principles that underlie these patterns. Drawing on cognitive semantics, the study categorizes motion verbs based on the specific semantic information typically encoded by their verb roots, namely manner, path, or shape. Through her investigation, Han's

findings demonstrate typological distinctions between English and Vietnamese in terms of the strategies employed to combine elements of path and manner of motion with the overarching concept of movement. In his study, Bien Duong (2021) investigates several models of fictive motion within the framework of cognitive linguistics. The objective of his research is to provide a comprehensive description and analysis of each model, focusing on three key aspects: basis, content, and characteristics. Notably, Duong highlights that the semantic scope of motion verbs extends beyond their literal interpretation, encompassing the expression of relationships that do not inherently involve physical motion or a change in state.

3. Theoretical studies

Since motion is a universal concept, each language has different elements of surface structure which represents represent it. According to Talmy's theory, languages can be categorized as verb-framed or satellite-framed depending on how path and manner are used in the verb stem or any satellites it may have, such as adverbs, noun phrases, and prepositions. The primary issue of Talmy's theory is how motion is expressed in various languages. To put it another way, Talmy's patterns emphasize the choice between the path and mode of motion and their transformation into formal language components (Talmy 2020).

The path is typically expressed in the verb stem in verb-framed languages like Spanish and French, but in satellite-framed languages like German and English in which the elements of manner can be readily lexicalized in the verb root since the element of the path is located in the satellites (Talmy, 2000). As a result, in this pattern, the verb root or the syntactic structure of the sentence both express the semantic element of manner or path of motion.

According to Talmy, a motion event is a condition or state that includes both motion and a sequence of various locations. He asserts that motion consists of two auxiliary components, manner, and cause, in addition to the four primary components of figure, motion, course, and ground. Examining the process of conceptualizing the motion event and its components based on the verb root is of the utmost importance because the verb is the primary element forming predicates that express an event (ibid, 25–27). The components of the motion event according to this idea include:

Elements	Properties
Figure	An entity with the ability of motion that, in the motion event, moves with respect to the ground or continues to remain motionless.
Ground	A frame of reference for determining the path or location of the figure.
Path	A direction passed by the figure with respect to the ground.
Motion	The same as the verb of motion that represents the concept of motion regardless of other semantic components.
Manner	The manner of performing the motion.
Cause	Anything that causes the motion event (ibid, 35–47).

Talmy presents two sets of surface- and deep-structure components for the motion event. While the deep structure focuses on the concepts of motion, the surface-structure components include words that can be used to express the idea of motion in any language. From those semantic components along with other external components namely circumstance and causation, Aske (1989) illustrates the motion events in the frame with the two layers, namely expanded and simple motion as in Figure 2.

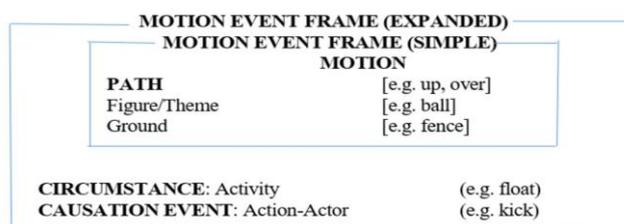


Figure 2. A frame of motion event

4. Research Methodology

The purpose of this section is to establish the theoretical framework for the study by providing an overview of Talmy's lexicalization patterns. Talmy's framework is used to analyze how languages express motion events through language-specific lexical and grammatical structures. To be more particular, the concepts of the manner of motion and the path of motion are explained and their relevance to the lexicalization of motion events is discussed.

4.1. Theoretical Framework:

Begin by providing a clear overview of Talmy's lexicalization patterns as the theoretical framework for the study. Explain the concepts of manner of motion and path of motion and their relevance to the lexicalization of motion events.

4.2. Data Collection:

- a) Identify and gather a diverse set of stories that depict motion events in the physical environments in Vietnamese.
- b) Ensure the selected texts cover a range of genres and contexts to capture a comprehensive representation of motion events in different scenarios.

4.3. Data Analysis:

- a) Perform a qualitative analysis of the annotated data to identify patterns and characteristics of motion events in the physical environments.
- b) Extract the motion verbs from the annotated data and compile them into a comprehensive list.
- c) Categorize the extracted motion verbs based on their manner and path of motion. This can involve creating subcategories within each main category for more detailed analysis.

4.4. Frequency Analysis:

- a) Conduct a frequency analysis of the categorized motion verbs to determine the prevalence of different lexicalization patterns in the physical environments.
- b) Calculate the frequency distribution of each category and subcategory of motion verbs to identify the most used expressions for motion events in each environment.

4.5. Semantic Analysis:

- a) Analyze the semantic characteristics of the motion verbs within each category and subcategory. Examine their inherent meanings and any additional connotations related to manner and path of motion.
- b) Identify semantic distinctions or variations between the physical environments, if present.

4.6. Interpretation and Discussion:

- a) Interpret the findings from the data analysis considering the theoretical framework and relevant literature on motion event lexicalization in Vietnamese.
- b) Discuss the implications of the observed patterns, including potential cultural, cognitive, or linguistic factors influencing the lexicalization of motion events in different environments.

5. Manners and Paths of Motion in Vietnamese

This section delves into the examination of two fundamental components within the realm of motion events: manners and paths. The exploration of manners of motion consists of an investigation across the distinct environments, encompassing their classification, the identification of verbs that denote these manners, as well as an analysis of the quantity and frequency of these verbs within the dataset. Similarly, the investigation of paths of motion entails a classification of these paths, an identification of the verbs associated with them, and an assessment of their quantity and frequency of occurrence.

5.1. Manners of Motion in the Physical Environments

The many forms or types of motion or movement are referred to as manners of motion. They represent how an object, person, or thing moves or behaves when it is moving. A linguistic notion known as manners of motion is used to define the various aspects or attributes connected with the execution of motion events. Manners of motion are frequently characterized and examined in the study of language and cognition using particular criteria or attributes. These criteria could be things like motion's speed, style, body language, gestures, postures, or physical acts. For instance, various forms of motion may involve any one or more of the following modes of locomotion: *đi bộ* 'to walk', *chạy* 'to run', *bò* 'to crawl', *bay* 'to fly', *boi* 'to swim', or any other. Every movement has its own distinctive qualities and attributes, which might differ between settings, languages, and cultures. Understanding how Vietnamese speakers encode and classify motion events comes from the study of motion manners in language and cognition. It aids the researcher in comprehending the linguistic processes used by speakers of Vietnamese to conceptualize and express motion. This current study can spot trends, semantic distinctions, and cultural factors that affect how motion is linguistically represented by looking at the ways in which different languages express motion. This analysis advances our knowledge of the relationship between language and cognition in the expression and perception of the dynamic nature of human movement. Table 1 provides a summary of the verbs used to describe motion events in different environments (air, land, and water) in Vietnamese. It presents the types of manner associated with each environment, along with the specific verbs, their quantity, and frequency of occurrence.

Table 1. Manners of motion in Vietnamese

Environments	Types of manners	Verbs	Quantity	Frequency
Air	Style	<i>Bay</i> 'to fly', <i>liệng</i> 'to hover', <i>lượn</i> 'to glide', <i>trôi</i> 'to drift'	4	36
	Speed	<i>Lao</i> 'to dart', <i>phóng</i> 'to propel', <i>vút</i> 'to soar'	3	
Land	Style	<i>Bò</i> 'to crawl', <i>trườn</i> 'to crawl', <i>bước</i> 'to step', <i>nhảy</i> 'to jump', <i>chui</i> 'to sneak', <i>mọc</i> 'to grow', <i>đi bộ</i> 'to walk', <i>trồi</i> 'grow up', <i>nhô</i> 'to rise'.	9	64
	Speed	<i>Chạy</i> 'to run', <i>đi bộ</i> 'to walk', <i>chạy bộ</i> 'to jog'	3	
	Vehicle	<i>Đi xe đạp</i> 'to ride', <i>đi ô tô</i> 'to drive'	2	
Water	Figure's motion	<i>Boi</i> 'to swim', <i>nặn</i> 'to dive', <i>lội</i> 'to wade' <i>chìm</i> 'to sink', <i>nổi</i> 'to float', <i>dạt</i> 'to drift', <i>ngoi</i> 'to rise up', <i>trồi</i> 'to surface', <i>chìm</i> 'to sink', <i>lướt</i> 'to skim'	10	42
	Ground's motion	<i>Chảy</i> 'to flow', <i>tràn</i> 'to overflow, <i>bốc hơi</i> 'to evaporate, <i>trôi</i> 'to float'	4	
Total			33	142

5.1.1. Manners of motion in the Air

Manners of motion in the air refer to different ways in which objects or entities can move through the air. These manners of motion are typically categorized based on the nature of the movement and the forces involved. In this domain, motion is expressed through two distinct manners: style (e.g., *bay*, *liệng*, *lượn* and *trôi*) and speed (e.g., *lao*, *phóng*, and *vút*).

When it comes to the manners of style, the flying manner is the most obvious manner of motion in the air. It involves sustained movement through the air, typically with the assistance of wings or other aerodynamic structures. Flying manner can be seen in various flying creatures, such as birds, bats, and insects, as well as in human-made aircraft like airplanes and helicopters. Likewise, gliding manner is a type of aerial motion that relies on the principles of aerodynamics to stay aloft. Gliders or gliding creatures, such as flying squirrels, use their bodies or specialized structures to generate lift and stay in the air. Next,

the floating manner refers to the manner in which objects or entities remain suspended in the air without any apparent propulsion or wing-like structures. Examples of floating can be seen in balloons filled with lighter-than-air gases, such as helium or hot air. These objects are buoyant and remain airborne due to the difference in density between the surrounding air and the gas inside the balloon. Last, the manner of hovering is the act of maintaining a stable position in the air without any noticeable forward or backward movement. Certain birds, like hummingbirds, can hover by rapidly flapping their wings in a figure-eight pattern. Similarly, insects like bees and dragonflies can hover in mid-air using their specialized flight mechanisms.

As for the manners of speed, which are *lao*, *phóng*, and *vụt*, these manners refer to the different velocities at which objects or entities can move through the air. The speed of aerial motion can vary greatly depending on various factors such as the nature of the object, the forces involved, and external conditions. Considering the manner of darting, the darting manner can describe a specific manner of motion characterized by a swift and vigorous movement in the air. It implies a rapid and forceful action of propelling oneself through the air with great speed and energy. This manner of the verb *lao* is often associated with a diving or swooping motion.

An exemplification of the Vietnamese manner *lao* within the domain of aerodynamics is provided herewith.

(1) Đàn chim én lao xuống từ trên cao.

flock swallows swoop descend from the height

'The flock of swallows swooped down from above.'

In this example, the manner of verb *lao* depicts the manner in which the swallows swiftly and forcefully dive down from a high altitude. It emphasizes the dynamic and energetic movement of the birds through the air. Next, the propelling manner in Vietnamese can describe a manner of motion in the air that involves launching or propelling oneself or an object with a significant amount of force and speed. It conveys the idea of projecting or shooting through the air with a powerful thrust. The manner of the verb *phóng* implies a rapid and forceful action that results in a quick movement in the air.

The Vietnamese manner of verb *vụt* designates an airborne motion style defined by a sudden and rapid movement or trajectory. It presents a quick, transient movement that is sometimes described as darting or streaking. The manner of the verb *vụt* is used highlights how quickly and abruptly the air is moving.

(2) Một tia sáng vụt qua bầu trời đêm.

a light run across sky night

'A streak of light flashed across the night sky.'

In brief, within the aerial context, the motion of the figures is frequently characterized by two distinct factors: style and speed. The former pertains to the various modes or patterns of motion exhibited by the figures, whereas the latter denotes the velocity at which they traverse. In the Vietnamese language, a total of five verbs have been identified as denoting these manners of motion, which have been observed to occur 36 times in the collected dataset.

5.1.2. Manners of motion on the land

The terrestrial domain encompasses an additional mode, namely the vehicle mode, in addition to the two modes shared with the aerial environment. Within the terrestrial environment, there exist two subcategories of style manners: horizontal manners (e.g., *bò*, *trườn*, *buớc*, *nháy*, *đi bộ*) and vertical manners (e.g., *mọc*, *chui*, *trèo*). Horizontal manners involve the figures acting as animate agents, maintaining direct contact with the land surface. Notably, in these manners of motion, the figures exhibit distinct bodily movements, while the speed of their locomotion tends to be relatively slow. To illustrate this point, consider the following example.

(3) The snake is crawling on the ground.

(Source: <https://www.aplustopper.com/movement-in-snakes>)

Figure 4. Manner in the snake's motion

Vertical manners encompass the motion directions exhibited by the figures, which include *chui*, *mọc*, *trồi*, and *nhô*. These manners primarily pertain to the locomotion of inanimate objects such as *cây* 'tree', *rễ cây* 'root', and *ụ mối* 'termite mound', which commonly traverse from lower positions beneath the surface of the ground to higher positions above the land's surface. Furthermore, as depicted in Figure 5, the figures characterized by these specific manners are observed to undergo slow and arduous movements.



(Source: <https://givasolar.com/>)

Figure 5. Manner in the bamboos' motion

Shifting focus to the second category of manners within the terrestrial realm, namely the manner of speed, it is characterized by linguistic expressions related to motion, such as *chạy*, *đi bộ*, and *chạy bộ*. These manners revolve around the physical contact between the figure and the land surface. While *chạy* and *chạy bộ* signify a rapid pace of movement, the manner of *đi bộ* conveys a slower velocity. Notably, the figures associated with this mode of motion encompass both animate entities (e.g., humans, animals) and inanimate objects (e.g., cars, motorbikes, trains).

Lastly, it is imperative to discuss the manners of *đi xe đạp* 'to bicycle' and *đi ô tô* 'to drive a car', which pertain to motion facilitated by specific vehicles. These manners necessitate that the figures engaging in such modes of motion be individuals. While the latter manner is dependent on the mechanical operation of a car, the former relies on the movement of the figures' legs for propulsion.

To summarize, within the terrestrial environment, manners play a crucial role in signifying motion. Specifically, these manners offer diverse insights into the gestures, models, and styles associated with the Figures' locomotion. In the dataset analyzed, a total of 14 manners were identified, occurring 64 times across the narratives.

5.1.3. Manners of motion in the water

The concept of manners of motion in water encompasses diverse techniques employed for locomotion and propulsion within an aquatic environment, typically categorized into two subtypes: figure's motion and ground's motion. Examining the manners associated with the figure's motion necessitates a more precise understanding of the figure's contextual factors and characteristics, as motion can significantly differ depending on the nature of the figure and the specific scenario. These manners elucidate distinct modes by which figures move through water, including *bơi*, *lặn*, *lội*, *bồng bênh*, *dạt*, *ngoi*, *trồi*, *chìm*, and *lướt*. Notably, the manners comprising *bơi*, *lội*, *nổi*, and *lướt* encompass motion involving contact between the figure and the water's surface, as depicted in Figure 5, while the manners of *nặn*, *ngoi*, *trồi*, and *chìm* consistently denote distinctive styles characterized by vertical directions of motion.



Figure 5: Manners of bơi, lội, nổi and lướt

Upon revisiting the manners of ground's motion, a noteworthy characteristic arises within the Vietnamese language, where both the figure and the ground partake as motional factors in these events. Notably, the manners encompass verbs such as *chảy*, *tràn*, and *bốc hơi*. The manner of the verb *chảy* in the Vietnamese language commonly serves to portray the process of fluid or substance movement, characterized by a continuous or persistent flow. Its usage extends metaphorically to denote the passage of time or the movement of emotions. Consequently, *chảy* is frequently associated with the notion of an unceasing or uninterrupted flow. To exemplify this assertion, one may contemplate the ensuing instance.

(4) Nước chảy từ vòi ra sông.

water flow from faucet exist river

'The water flows from the faucet to the river.'

This example elucidates the process of water cascading from a faucet and ultimately finding its course into a river. However, this simple meaningful depiction underscores the directional movement of water and its traversal from a localized source to a more extensive natural body.

Subsequently, the manner of the verb *tràn* in Vietnamese warrants examination, as it delineates the action of overflowing or spilling in a manner surpassing established limits or boundaries. This manner signifies an abundance or unrestrained flow, resulting in spillage or overflow. Additionally, the manner of the verb *bốc hơi* in Vietnamese pertains to the manner of evaporation or vanishing. It denotes the transformative process by which a substance transitions from a liquid or solid state into a gaseous or vapor state, typically attributed to the application of heat or the dissipation of particles.

In summary, the manners of motion in water, whether in relation to the figures' motion or the ground's motion, encompass specific actions and modes of movement that contribute to a comprehensive comprehension of how objects and substances interact with water within the Vietnamese language. Notably, there are thirteen identified manners within the data, ranking second among the three manners in the physical environment. The occurrence frequency of these manners in the dataset is forty-two, indicating the diverse range of linguistic resources Vietnamese speakers employ to articulate motion in aquatic settings.

5.2. Paths of Motion in the Physical Environments

The routes, directions, or trajectories taken by objects or people as they travel from one place to another are referred to as their paths of motion. They reflect a moving object or person's precise course or path as they move through space. The various paths that motion is communicated in Vietnamese are categorized and described using a linguistic concept called paths of motion. Aspects including linear paths, circular paths, vertical paths, curvilinear paths, multidirectional paths, and other spatial orientations or configurations may be included in these parameters. Paths of motion are encoded and expressed differently in different languages. The direction, form, or geographical aspects of the path may be indicated using verbs, prepositions, or adverbs in Vietnamese. Insights into how Vietnamese speakers understand and convey the spatial aspect of motion can be gained by analyzing the routes of motion in language and organize and describe the trajectories of moving objects or people. This section is intended to spot trends, semantic distinctions, and cultural factors that affect how motion is represented linguistically by looking at the motion trajectories in Vietnamese, and shed light on how language influences how we perceive and comprehend spatial relationships and movement in the world. Table 2 presents a comprehensive overview of the various manners observed within the three contexts, accompanied by the corresponding number of verbs associated with each manner and their respective frequencies as evidenced in the dataset.

Table 2. Paths of Motion in Vietnamese

Environments	Types	Path	Quantity	Frequency
	Linear path	<i>Tới</i> 'to come', <i>về</i> 'to return', <i>vào</i> 'to enter', <i>ra</i> 'to exist',	4	67
Air	Circular path	<i>Quanh</i> 'to go around'	1	25
Land	Vertical path	<i>Lên</i> 'to ascend', <i>xuống</i> 'to descend'	2	37
Water	Curvilinear path	<i>vòng</i> 'to rotate'	1	22
	Multidirectional path	<i>Tung tóe</i> 'to scatter' <i>phân tán</i> 'to disperse', <i>rải rác</i> 'to spread out'	3	11
Total			11	162

5.2.1. Linear paths

Within the Vietnamese linguistic context, the notion of a linear path encompasses the trajectory or course of motion that adheres to a straight or uninterrupted route, which is verbalized in three environments. This specific path is exemplified by verbs such as *tới*, *về*, *vào*, and *ra*, which are categorized into two symmetric pairs of paths, including *tới* and *về*, and *vào* and *ra*. The defining characteristic of this path lies in its direct and undeviating movement along a predetermined direction, devoid of significant deviations or alterations in course. The linear path can be conceptualized as a line segment connecting two distinct points or as a continuous trajectory with minimal curvature. When articulated in Vietnamese, the expression of linear paths employs the deployment of specific verbs, prepositions, or other linguistic constructions, which effectively convey the concept of unswerving or direct movement from one location to another. The linguistic representation of linear paths within the Vietnamese language serves to enrich the intricate tapestry of motion event descriptions inherent in the language.

Vietnamese's initial set of paths, which are expressed by two verbs *tới* and *về*, are crucial in expressing the spatial relationship between the speaker and the listener. These verbs are used to signify movement toward or away from the speaker (*tới*) and vice versa (*về*). The *tới* implies a spatial proximity between the speaker and the verb's subject by expressing the idea of approaching or moving closer to the speaker's place. On the other hand, the path of the verb *về* signifies the act of moving away from the speaker or returning to a location separate from the speaker's position. Together, these verbs allow for the communication of spatial dynamics and the establishment of spatial relationships within the Vietnamese language, particularly in situations involving the speaker's presence and the listener's motion as in Figure 6.

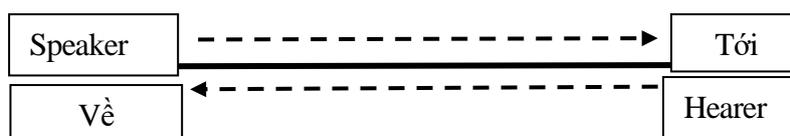


Figure 6: The Scheme of the paths *tới* and *về*

The second pair of paths in Vietnamese, which is denoted by two verbs *vào* and *ra*, pertains to the relationship between the inside and outside of a certain space or location. These verbs are employed to describe the action of entering or going into a space (*vào*) and exiting or coming out of a space (*ra*). They highlight the directional aspect of movement in relation to the boundaries or confines of a particular area. While *vào* signifies the act of moving from the outside to the inside, *ra* signifies the act of moving from the inside to the outside. Together, these verbs enable the expression of the spatial dynamics associated with entering and exiting various spaces within the Vietnamese language as in Figure 6.

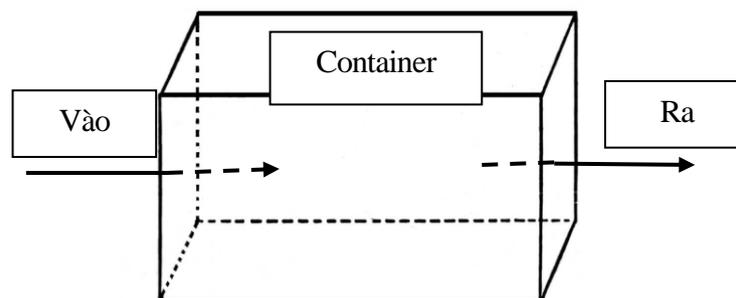


Figure 7: The scheme of the paths vào and ra

5.2.2. Curvilinear paths

In the Vietnamese language, the concept of a curvilinear path can be linguistically conveyed through a variety of elements that capture the notion of movement along a trajectory that is curved or non-linear. One effective approach to expressing a curvilinear path in Vietnamese involves the utilization of descriptive verbs or adverbs that evoke the idea of a curved trajectory, such as the path *vòng*. This path, when employed as a verb, encompasses two fundamental semantic components, namely motion and path. Conversely, when utilized as an adverb, *vòng* typically indicates movement around or circling an object or location, thereby implying a path that is curved. Its usage is frequently observed in conjunction with various motion verbs, and these interactions can be categorized into three distinct environments, as illustrated in Table 3.

Table 3. Curvilinear paths

Aerial environment		Aquatic environment		Territorial environment	
Bay		Bơi		Bò	
Lượn	vòng	Lướt	vòng	Trườn	vòng
Trôi		Chạy		Nhảy	
		Trôi		Đi bộ	
				Chạy	
				Đi bộ	
				Chạy bộ	
				Đi xe đạp	
				Đi ô tô	

Moreover, in Vietnamese, the explicit description of a curved path can be achieved through the use of adverbs or adverbial phrases, such *vòng quanh* meaning 'around'. These linguistic expressions serve to enhance the clarity regarding the non-linear trajectory taken during the motion. It is noteworthy that although Vietnamese lacks a specific lexical term denoting the curvilinear path, it offers a range of linguistic resources, including descriptive verbs, prepositions, and adverbial phrases, which enable speakers to convey the notion of movement along a curved trajectory in a nuanced and precise manner.

5.2.3. Vertical paths

The Vietnamese speakers express the vertical path by using different linguistic elements that convey the idea of movement along a vertical or vertical-oriented trajectory. There is one way to express a vertical path in Vietnamese is through the use of directional verbs or adverbial phrases that indicate upward or downward movement. For example, the verb *leo* 'to climb' can be used to describe the action of ascending or moving vertically upwards. Similarly, the verb *xuống* 'to descend' or *rơi* 'to fall' can be employed to convey descending or vertical downward movement. In addition, a wide range of manner motion verbs are combined with this path to make up the expressions related to vertical actions or motions can be utilized to express the vertical path more explicitly. For instance, the phrasal verb *bay lên* 'to fly up' in the aerial environment, *nhảy xuống* 'to jump down' in the aquatic environment, or *nhô lên* 'to grow up' in the

territorial environment provide clear indications of vertical movement. Furthermore, prepositions or directional phrases such as *lên* 'up' and *xuống* 'down' can be combined with nouns or phrases to express vertical paths. For example, *lên cầu thang* 'up the stairs' or *xuống hầm* 'down to the basement' denote vertical movements along staircases or into underground spaces. It is important to note that not only Vietnamese has a specific term for the vertical path, but does it offer various linguistic resources such as directional verbs, prepositions, and adverbial phrases that allow speakers to express the concept of movement along a vertical or vertical-oriented trajectory in a comprehensive manner.

5.2.4. Circular paths

The Vietnamese circular trajectory can be effectively conveyed through the utilization of diverse linguistic elements. These elements serve to encapsulate the notion of movement along a circular or rotational path. In Vietnamese, one approach to expressing a circular path involves the application of descriptive verbs such as *xoay* meaning 'to rotate' and *quay* meaning 'to go around'. These linguistic components inherently evoke the concept of circular or rotational motion. The trajectory denoted by the verb *xoay* can be employed to describe the action of moving in a circular or spinning manner and can be further combined with adverbs like *xoay vòng* meaning 'to rotate in a circle', or *xoay quanh* meaning 'to rotate around'. An alternative method entails harnessing the trajectory implied by the verb *quay*, which connotes circular or cyclic movement. Similar to *xoay*, the verb *quay* can be combined with specific adverbs to express movement along a circular path. For instance, the phrase *quay quanh* meaning 'to go around in a circle' signifies circular movement. These linguistic expressions contribute to enhanced clarity regarding the rotational trajectory followed during the course of movement. The utilization of this circular path is pervasive across three contexts in Vietnamese, particularly when it is combined with most manner motion verbs, as illustrated in the provided Table 4.

Table 4. Circular paths

Aerial environment		Aquatic environment		Terrestrial environment	
Bay		Boi		Bò	
Lượn	quanh	Lướt	quanh	Trườn	quanh
Trôi		Cháy		Nhảy	
		Trôi		Đi bộ	
				Chạy	
				Đi bộ	
				Chạy bộ	
				Đi xe đạp	
				Đi ô tô	

5.2.5. Multidirectional paths

Vietnamese requires the use of a variety of linguistic elements to represent a multidirectional path that successfully conveys the idea of movement occurring in several directions. Vietnamese speakers use descriptive verbs or adverbial phrases that naturally imply movement occurring in a variety of directions to convey a multidirectional path. For example, the *phân tán*, *tung tóe* or *rải rác* path can be used to define actions involving travel in several directions or along different paths. These language terms help to increase the level of clarity in relation to the various directions or courses that movement may take. The concept of movement occurring in multiple directions or along different paths can be effectively expressed by speakers of Vietnamese even though the language lacks a specific term designating the multidirectional path. Instead, it makes use of a variety of linguistic tools like descriptive verbs, prepositions, and adverbial phrases.

6. Motion Events in the Physical Environments

Motion events in physical environments pertain to the incidents or alterations in the spatial disposition, situation, or locomotion of objects or entities within a specified spatial domain. These events encompass

the discernment, pursuit, and examination of diverse forms of motion, including translational displacement (linear movement), rotation, acceleration, and deceleration. The scrutiny and evaluation of motion events transpire within three primary spheres of observation, spanning from aerial contexts to terrestrial settings.

6.1. Motion + Path in the physical environment

The concept of motion + path refers to the combination of motion and path to describe the movement of objects, organisms, or entities along a specific trajectory or route. It involves considering both the type of motion and the path followed by the movement to provide a more comprehensive understanding of how actions or movements occur. The motion refers to the act or process of changing position or location. It encompasses various forms of locomotion, such as walking, running, swimming, flying, or any other mode of movement. The path refers to the trajectory, route, or course followed by the motion. It describes the spatial characteristics of the movement, including straight lines, curves, zigzags, spirals, or any other patterns that define the route taken. By combining motion and path, we can provide a more detailed and nuanced depiction of how objects, organisms, or entities move. This combination allows for a comprehensive understanding of the spatial aspects, patterns, and characteristics of the movement. Table 3, which organizes motion events in the spatial environment by type, motion verbs, paths, and frequencies, completes the study by giving a thorough summary of all motion events in three environments. It is a useful tool for understanding how various motion kinds are expressed linguistically and interpreted in relation to space and physical world.

Table 3. Motion + Path events in physical environments

Type	Types of motion	Motion verbs	Paths	Frequency	
Physical environment	Transition	Bay, trôi, bơi, lướt, chày, trôi, lao, phóng, bò, trườn, bước, nhảy, chui, đi, đi bộ, chạy, đi bộ, chạy bộ, đi xe đạp, đi ô tô, dạt, tràn, lội	Linear path	75	
		Phóng, vút, lao, leo, roi, bò, trườn, bước, nhảy, chui, mọc, trôi, nhô, nổi, chìm	Vertical path	64	
		Bay, lướt, lướt, bơi, bò, trườn, nhảy, bước, đi, đi bộ, chạy, chạy bộ, đi xe đạp, đi ô tô, lội, trôi, chày.	Circular path	57	
		Văng, bắn, quăng, ném.	Multidirectional path	22	
	Rotation	Bay, lướt, lướt, bơi, bò, trườn, nhảy, bước, đi, đi bộ, chạy, chạy bộ, đi xe đạp, đi ô tô, lội, trôi, chày.	Curvilinear path		
			Circular path	31	
		Quay, xoay	Curvilinear path		
Total				249	

6.1.1. Transitional motion events in the physical environments

The phenomenon of motion or activity that entails a shift or alteration in position, state, or condition is commonly known as a transitional motion event. Such instances encapsulate the transformation from one specific location, situation, or circumstance to another. In order to gain a comprehensive understanding of how Vietnamese speakers convey and encode this type of motion, the researcher has conducted extensive investigations into the concept of transitional motion events, which is a combination of motion verbs and paths. A range of movements, encompassing actions like entering, existing, approaching, departing, climbing, descending, changing position, are all classified as instances of transitional motion events. These occurrences entail a modification in the spatial or temporal reference point. Vietnamese speakers utilize a diverse array of linguistic constructions, including verbs, adverbs, prepositions, and grammatical structures, to represent transitional motion events. In order to communicate these events effectively, certain languages may possess specialized lexical and grammatical resources dedicated to this purpose.

a. Transitional motion + Linear paths

Vietnamese speakers use a construction to signify movement and a straight, linear path, resulting in the typology motion + linear path. The analysis of Vietnamese's representation and encoding of linear motion is made possible by this combination. In the construction, the motion refers to the actual movement or displacement, which is expressed by the motion verbs (e.g., *bay, boi, lướt, chày, lượn, trôi, chạy, bò, trườn, đi, chạy, đi bộ, đi xe đạp, đi ô tô*), while the linear path refers to the motion's continuous and straight direction (e.g., *đến, tới, về, vào, ra*). Vietnamese people employ a wide variety of linguistic tools, such as particular verbs, directional cues, and grammatical structures, to communicate this idea. Vietnamese speakers, for instance, frequently use the verb *đi* 'to go' to signify a motion event in a straight line. To specify a specific linear path, this verb can be used in conjunction with directional indications like *theo* 'along' as in (5a), *dọc* 'alongside' as in (5b), or *qua* 'across' as in (5c). Other verbs like *chạy* 'to run', *đi bộ* 'to walk', or *lao* (to rush) may also be used, depending on the direction of the motion. The Vietnamese language offers the means to effectively convey and encode the idea of linear motion by using certain linguistic elements.

(5) a. Anh đi theo con đường.

he go along road

'He walks along the road.'

b. Tôi chạy qua công viên.

I run across park

'I run across the park.'

c. Cô ấy đi bộ dọc bờ sông.

she walk alongside riverbank

'She walks alongside the riverbank.'

These instances serve as illustrations demonstrating the coexistence of motion and linear paths within Vietnamese expressions, wherein verbs and directional markers function to delineate the exact path or direction undertaken by the movement. Consequently, it becomes imperative to scrutinize the verbs, directional indicators, and grammatical structures employed in Vietnamese to denote linear motion for the purpose of comprehending and elucidating the concept of motion + linear path. This analysis aims to contribute to the advancement of our understanding regarding the linguistic typology of motion events in Vietnamese by shedding light on how Vietnamese people conceptualize and linguistically convey movement along a straight trajectory. Based on the results obtained from the data of 75 instances in Table 3, we can conclude that this is the most prevalent type of motion event in Vietnamese.

b. Transitional motion + Vertical paths

The linguistic phenomenon of motion + vertical path in Vietnamese pertains to the integration of motion verbs and a vertical trajectory, whereby movement or action along a vertical path is represented, indicating changes in elevation or vertical displacement. This conceptual framework enables an analysis of how Vietnamese speakers encode and convey motion in a vertical direction. Within the construct of Motion + Vertical path, the notion of motion denotes the act of movement or displacement, while the vertical path signifies the upward or downward trajectory along which such motion occurs. Vietnamese language users employ specific linguistic components, including verbs, directional markers, adverbs, and grammatical structures, to communicate this concept. For instance, the verb *leo* 'to climb' is frequently utilized in Vietnamese to express upward motion along a vertical path. It can be combined with directional markers or prepositions such as *lên* 'up' to indicate the vertical direction of the motion. Similarly, verbs like *rơi* 'to fall', *nhảy* 'to jump', or *xuống* 'to descend' can be employed to convey downward motion along a vertical path. The following example illustrates the concept of motion + vertical path in Vietnamese:

(6) Anh ta leo lên núi.*he climb ascend mountain**'He climbs up the mountain.'*

In the given illustration, the verb *leo* serves to signify the action of climbing, while the phrase *lên núi* denotes the upward vertical path, explicitly indicating the subject's ascent of the mountain. A comprehensive analysis and explication of motion + vertical path in Vietnamese necessitate an examination of the precise verbs, directional markers, and grammatical structures employed to convey vertical motion. This investigation facilitates a deeper comprehension of how Vietnamese speakers conceptualize and linguistically express movement along a vertical trajectory, thereby augmenting our knowledge pertaining to the linguistic typology of motion events within the Vietnamese language. According to the data collected from Table 3, this type of motion event is the second most prevalent with 64 instances.

c. Transitional motion + Curvilinear paths

The concept of motion + curvilinear path in Vietnamese pertains to the amalgamation of motion and a path that deviates from a straight line, possessing a curved nature. It encompasses the depiction of movement or action transpiring along a curving or bending course, denoting alterations in direction or adherence to a curved route. A thorough investigation of Vietnamese's encoding, and expression of motion along curved path is made possible by this conceptual framework. The concept of motion refers to the act of displacement or movement inside the motion + curvilinear path construct, while the concept of curvilinear path refers to the trajectory along which the motion unfolds, which is distinguished by its curvy or non-linear features. Vietnamese speakers use a variety of linguistic devices, including verbs, adverbs, directional indicators, and grammatical structures, to express this idea. To indicate the circular or curved aspect of the journey, it may be used with directional indicators like *vòng* 'to rotate'. The verb like *đi* 'to go' might help explain how motion occurs along a curved path in more detail. The Vietnamese example of motion + curvilinear route includes the following:

(7) Anh ta đi vòng công viên.*he walk rotate park**'He walks around the park.'*

The construction of *vòng công viên* specifically describes the trajectory as curvilinear in the present instance, indicating the subject's round or curved movement around the park. The verb *đi* serves to convey the activity of ambulation. Examining the verbs, adverbs, directional markers, and grammatical structures used to indicate motion along curved paths is necessary for the analysis and explanation of motion + curvilinear path in the Vietnamese language. This type of analysis helps us better understand how Vietnamese conceptualizes and linguistically portrays movement along non-linear trajectories, which advances our knowledge of Vietnamese's linguistic typology for motion occurrences.

d. Transitional motion + Multidirectional paths

The concept of motion + multidirectional path refers to the combination of a motion verb with a path that indicates movement in multiple directions. However, Vietnamese does not have a specific grammatical construction that directly corresponds to this concept. Instead, multidirectional paths are typically expressed using adverbs *tung tóe* 'to scatter', *phân tán* 'to disperse' or *rải rác* 'to spread out'. These paths are commonly used in Vietnamese to describe a scattered, chaotic, or haphazard manner of movement or action. It conveys the idea of something being thrown, scattered, or moving in various directions without a specific pattern or order. Also, these paths are typically used to modify verbs, describing the manner in which an action is performed. It can be applied to various activities involving physical movement or actions that result in dispersal or scattering. The event of motion + multidirectional path is a combination of motion that denote the movement of the figure (e.g., *bắn, quăng, bắn, ném*) while the multidirectional paths (e.g., *tung tóe, phân tán, rải rác*). To illustrate this point, consider the following example.

(8) Anh ta ném tung tóe đá vào hồ.*he throw scatter stone enter lake**'He haphazardly throws rocks into the lake.'*

In the given illustration, the path *tung tóe* serves to accentuate the uncontrolled, scattered, and disordered characteristics inherent in the actions or movements under scrutiny. Its application imparts a notion of unpredictability and disorder to the overarching significance. Analyzing the available data reveals that the occurrence of motion events encompassing motion + multidirectional path is comparatively infrequent in Vietnamese, transpiring only 22 instances.

6.1.2. Rotational motion events the physical environments

Rotational motion events hold significance within the realm of the Vietnamese language, contributing to its grammatical structure and linguistic characteristics. This article aims to explore the role of rotational motion in the context of Vietnamese linguistics and shed light on its implications. By examining grammatical features such as verb conjugation and sentence structure, a comprehensive understanding of the impact of rotational motion on the Vietnamese language will be attained. Through this exploration, readers will gain an enriched comprehension of the intricate interplay between rotational motion and the linguistic framework of Vietnamese, thereby fostering a deeper appreciation for the language's complexities and unique linguistic characteristics.

a. Rotational motion + Circular paths

The expression of the rotational motion and circular paths are closely related concepts in language. The rotational motion refers to the movement of an object around a fixed axis, involving changes in orientation while maintaining the axis of rotation. The second element of the circular paths, on the other hand, describe the trajectory followed by an object moving in a circular pattern, maintaining a constant distance from a central point. More particularly, the rotational motion often gives rise to circular paths as objects spin or turn around a fixed axis, creating continuous loops or orbits. These events can be understood by examining the Vietnamese verbs *xoay* and *quay* and their combination with the path *quanh*. The verb *xoay* denotes the act of rotating or turning an object around an axis, implying a change in orientation while maintaining a fixed axis. On the other hand, *quay* describes the circular movement of an object around a central point or along a specific path, consistently returning to its starting position. When combined with *quanh*, these verbs form the phrase *quay quanh*, indicating the motion of an object revolving or rotating around something. In the context of circular paths, *quay quanh* signifies an object's movement along a circular trajectory, maintaining a constant distance from the center while completing full revolutions or multiple rotations.

b. Rotational motion + Curvilinear paths

In this framework, the rotational motion involves the spinning or turning of an object around a fixed axis, while curvilinear paths refer to the trajectory followed by an object as it moves along a curved path. The rotational motion focuses on changes in orientation around the axis of rotation, while the curvilinear paths emphasize continuous changes in direction along the curve. These concepts help explain the motion of spinning objects and the movement of objects along curved trajectories, providing valuable insights into the dynamics of motion in various contexts. Analyzing the Vietnamese verbs *xoay* and *quay* in conjunction with the word *vòng* enhances our comprehension of rotational motion and curvilinear paths. *Xoay* refers to the act of an object rotating or turning around an axis, involving changes in orientation while maintaining the axis itself. In contrast, *quay* signifies the object's circular movement or revolution around a central point or along a specific path. When combined with *vòng*, these verbs indicate that objects not only rotate around an axis but also traverse circular trajectories or loops. By considering the combination of *xoay* or *quay* with *vòng*, we gain deeper insights into how objects experience rotational motion and navigate curvilinear paths.

6.2. Motion + Manners in the physical environments

The concept of motion + manner refers to the combination of two elements: motion and manner, in order to provide a more comprehensive and detailed description of how an action or movement takes place. The first element of motion refers to the act or process of changing position or location. It involves the physical movement or displacement of objects, organisms, or entities from one place to another. In the context of motion + manner, it specifically relates to the movement within a particular environment or domain, such as the air, water, land, or any other specified physical setting. Next, the manner describes the style, characteristic, or way in which an action or movement occurs. It focuses on the qualities or attributes that define the specific way the motion takes place. Manner provides additional information about the speed, smoothness, force, gracefulness, or any other distinguishing features that shape the particular expression of the movement. By combining motion and manner, a more comprehensive understanding and depiction of an action or movement can be achieved. The concept of motion + manner allows for a more nuanced and vivid portrayal of how objects, organisms, or entities move within a given environment. It enables the inclusion of specific details about the quality, style, or attributes that accompany the motion, enhancing the richness and depth of the description. Table 4 summarizes the types of materials in the physical environment, associated motion verbs, manner descriptions, and their respective frequencies. The table categorizes the physical environment into three main types: air, water, and land.

Table 4. Motion + Manner Events in Physical Environment

Type	Types of materials	Motion verbs	Manner	Frequency
Physical environment	Air	Bay, lượn, liệng, trôi	Style	37
		Phóng, vụt, lao	Speed	21
	Water	Bơi, nặn, lội, chèo, nổi, dạt, ngoi, trôi, chèo, lướt, ngoi.	Figure's motion	58
		Chảy, trôi, tràn, bốc hơi	Ground's motion	43
	Land	Bò, trườn, bước, chạy, nhảy, chui, mọc, đi bộ, trôi, nhô	Style	49
		Chạy, đi bộ, chạy bộ, bò, trườn, lê, chui	Speed	38
Total		Đi xe đạp, đi ô tô	Vehicle	42
				288

6.2.1. Motion + Manners in the air

Motion events in the air encompass a broad range of captivating occurrences that involve the movement of objects through the atmosphere. They encompass the flight of living creatures, the engineering marvels of human-made aircraft, and the natural forces that govern their behavior. From the gentle fluttering of a butterfly's wings to the thunderous roar of a supersonic jet, the study of motion events in the air encompasses both the serene and the extraordinary.

a. Motion + style manners in the air

Within the framework of the motion + style manner concept, the notion of motion in the air pertains to the act of objects, organisms, or vehicles moving or being displaced through the atmospheric medium. It encompasses a diverse range of locomotive actions, including but not limited to *bay* 'to fly', *lượn* 'to glide', *liệng* 'to soar', *trôi* 'to drift', and various other modes of aerial locomotion that occur above the terrestrial surface within the expansive aerial environment. The concept thus encompasses the comprehensive spectrum of movements within this atmospheric realm, allowing for the examination and analysis of diverse forms of locomotion manifesting within the dynamic realm of the air. The subsequent component in this conceptual framework is the style manner, which pertains to the distinct characteristics or qualities inherent to the motion transpiring within the atmospheric milieu. It encompasses the delineation of the specific style, manner, or approach by which the motion unfolds. The style manner element serves to convey intricate details concerning the gracefulness, agility, forcefulness, or other salient attributes that contribute to the overall characterization of movement within the airspace. By incorporating the style manner component, a more comprehensive understanding of the subtleties and nuances

underlying the motion events in the air can be attained. The combination of motion and style manner within the aerial context facilitates a more intricate and refined depiction of an object or entity's movement in the atmospheric environment. By integrating both the type of motion and the specific style or manner in which it transpires, a vivid and comprehensive portrayal of the action occurring in the air can be attained. To elucidate this notion, let us consider the following exemplification.

(9) Đàn chim bay trên bầu trời.

flock bird fly on sky

“*The flock of birds are flying in the sky.*”

In the presented example, the verb *bay* denotes the motion of flying, yet the absence of accompanying descriptive terms or modifiers leaves the specific manner in which the birds are flying open to interpretation. While the sentence does not explicitly specify the style or manner of the birds' flight, it can be inferred from the verb *bay* itself, which inherently encompasses a general sense of flight characteristic to birds.

b. Motion + speed manners in the air

Motion and speed manner are two interconnected concepts when considering movement in the air. The motion refers to the displacement or change in position of objects or entities, while the speed manner characterizes the specific way or style in which such movement occurs. Combining these concepts, we delve into the analysis of how objects navigate and travel within the air. By examining both the overall motion and the particular manner in which objects move, we gain insight into the intricate dynamics of aerial displacement. This analysis provides a comprehensive understanding of the intricate relationship between motion verbs (e.g., *phóng*, *vút*, *lao*) and speed manner in the context of the air, shedding light on the complex mechanics and characteristics of objects in flight. The verb *phóng* in the context of motion in the air, the focus is on its meaning as ‘to launch’ or ‘to propel.’ Specifically, it denotes the action of initiating or causing an object to move swiftly and forcefully through the air. This movement typically involves a significant speed and a directed trajectory. Likewise, the verb *vút* in the context of motion in the air describes a manner of movement that is characterized by swift, soaring, and dynamic qualities. When something *vút* in the air, it suggests a rapid and graceful motion that is often associated with flying creatures or objects. This manner of motion implies a sense of speed, agility, and elevation. The object or entity that *vút* moves through the air swiftly and smoothly, gliding or ascending with ease. It conveys a sense of fluidity and gracefulness, akin to how birds soar, or certain objects smoothly traverse the atmosphere. Lastly, in the context of motion in the air, the Vietnamese verb *lao* encompasses a swift and energetic movement characterized by diving or plunging. It conveys the notion of an object rapidly descending or propelling itself forward through the atmosphere with vigor and velocity. For example, in the case of a hunting duck, the verb *lao* signifies its decisive descent into the water to capture prey. This verb accentuates the dynamic and purposeful nature of the motion, conveying traits such as agility, determination, and a directed trajectory. By evoking the concept of swift and forceful movement, *lao* embodies the image of an object in airborne motion, whether it be a bird diving or another entity propelling forward with significant momentum.

6.2.2. Motion + Manners in the water

The examination of motion + manner in the water involves a comprehensive investigation into the coordinated aspects of movement and characteristic style within aquatic environments. Due to the dynamic properties of water, objects and organisms display distinct patterns of motion and manners during navigation. Gaining a thorough understanding of the intricate interplay between motion and manner in water is crucial for elucidating the behaviors and dynamics of aquatic systems. This discussion establishes the foundation for further exploration into the integrated analysis of motion and manner, unveiling a wide spectrum of movements and corresponding styles observed in water.

a. Motion + manner of figure's motion

Motion refers to the act of changing position or location in space, involving the movement of an object or figure. It can take various forms such as linear, circular, oscillatory, or projectile motion. On the other hand, the manner of figure's motion focuses on the specific way in which the object or figure moves. It consists of attributes such as style, speed, direction, smoothness, rhythm, acceleration, or deceleration. Describing the manner of figure's motion provides insights into the unique qualities and characteristics of the movement. For instance, the motion of a person walking can be described as linear, while the manner of their motion may be brisk, smooth, or graceful. Understanding both motion and the manner of figure's motion enables a more comprehensive analysis of an object or figure's movement in space. Moreover, the manners of these events are denoted by an array of motion verbs in the physical environments (e.g., *boi, nặn, lội, chìm, nổi, dạt, ngoi, trôi, chìm, lướt, ngoi*). The collected data indicates that this particular type of motion is the most prevalent within the Vietnamese language. It is observed to occur 58 times in the dataset, suggesting its frequent usage and significance in the linguistic context.

b. Motion + manner of ground's motion

In this framework, the concept of motion pertains to the change in position or location exhibited by an object or agent, which is denoted by several verbs (e.g., *chảy, trôi, tràn, bốc hơi*). It includes the overall displacement and movement of the figure through space. Different forms of motion, such as linear, circular, oscillatory, or projectile, can be observed depending on the specific path followed. On the other hand, the concept of manner delves into the finer details of how the figure executes its motion. It focuses on the specific attributes, characteristics, and qualities that shape the movement, including factors such as speed, direction, smoothness, rhythm, acceleration, and deceleration. One more element needs to be clarified is the ground because for this framework the figure and ground of the motion are overlapped. The ground of motion is the reference point used to observe or measure how an object moves that provides a stable basis for evaluation. Choosing the right ground of motion is important because it affects how humans describe and understand the object's motion. Different reference points can give different measurements of speed, velocity, and acceleration. To illustrate this point, consider the sentence *Nước chảy* 'water flows.' It represents the dynamic movement of water, such as rivers or waterfalls that can symbolize fluidity, change, and progress, both literally and metaphorically. The analysis of both motion and manner provides a comprehensive understanding of the figure's behavior in relation to its movement. While motion examines the broader aspects of displacement and transition, manner delves into the intricacies that give the movement its distinct style or behavior. This comprehensive examination enhances the comprehension of the figure's dynamics and enables a more detailed analysis of its motion within its specific context.

6.2.3. Motion + manners on the land

The study of motion + manners on the land encompasses a comprehensive analysis of both movement and characteristic style within terrestrial environments. As entities traverse the solid ground, they exhibit distinct patterns of motion and manners that contribute to the complex dynamics of land-based locomotion. Understanding the intricate interplay between motion and manners on the land is essential for comprehending the underlying behaviors and biomechanics of terrestrial systems. This introduction establishes the foundation for further exploration into the combined analysis of motion and manners, shedding light on the diverse repertoire of movements and corresponding styles observed in terrestrial settings.

a. Motion + style manners on the land

Motion + style manner on the land entails a comprehensive examination of both movement and distinct styles or manners exhibited during terrestrial locomotion. This analysis encompasses various forms of motion, including *bò, trườn, bước, nhảy, chui, mọc, đi bộ, trôi, nhô*, and entails the scrutiny of the particular characteristics that define the style or manner in which these motions are executed. For instance, *đi bộ* encompasses not only the fundamental act of forward movement, but also individual styles distinguished by factors such as stride length, arm swing, and postural alignment. Similarly, *chạy* encompasses unique styles shaped by elements such as speed, rhythm, foot strike patterns, and overall

running technique. Through the exploration of both motion and style manner on the land, which helps acquire valuable insights into the multifaceted ways in which individuals, animals, and objects navigate and engage with terrestrial environments.

b. Motion + speed manners on the land

Motion + Speed manners on the land encompass a comprehensive analysis of movement and the distinctive styles or manners associated with speed during terrestrial locomotion. This investigation includes various forms of motion, such as *chạy*, *đi bộ*, *chạy bộ*, *bò*, *trườn*, *lê*, *chui*, with a specific focus on examining how these motions are performed with unique styles and manners while considering the element of speed. When studying *đi bộ*, for example, attention is given not only to the basic act of forward movement but also to individual walking styles, characterized by factors like pace, stride length, arm swing, posture, and the velocity at which one walks. Likewise, the analysis of *chạy* extends beyond mere rapid movement, encompassing elements like speed, rhythm, arm movements, foot strike patterns, and overall running technique.

c. Motion + vehicle manners on the land

Motion is an inherent aspect of transportation, encompassing the act of movement and change in position. Vehicles serve as the means to facilitate motion and enable the transportation of people and goods. Cars and passenger vehicles allow individuals to drive, accelerating along the roads and highways, maneuvering through traffic with skill. Motorcycles offer an exhilarating experience as riders ride and zoom through the streets, leaning into turns and embracing the thrill of the open road. Bicycles provide a human-powered mode of transportation, where riders pedal, cycling along pathways and enjoying the rhythmic motion as they explore their surroundings. Meanwhile, pedestrians gracefully walk or leisurely stroll, moving with purpose and embracing the freedom of human mobility. Public transportation vehicles, such as buses and trains, transport passengers as they ride and commute, navigating through urban landscapes and ensuring efficient movement for a multitude of individuals. These vehicles and their associated motion verbs reflect the diverse ways in which people engage with transportation, embodying the essence of motion on land.

7. Conclusion

This study has examined the lexicalization of motion events combining with manners and paths in the Vietnamese language. The findings reveal that Vietnamese possesses a rich system of motion verbs that combine with manners and paths to provide detailed and accurate descriptions of motion within physical environments. Motion verbs in Vietnamese exhibit clear distinctions in terms of manners and paths. They can combine with manner adverbs to describe how the motion occurs, including speed, mode, and gesture. Additionally, they can also combine with path adverbs to specify the route, trajectory, or direction of the event. This combination allows for flexibility in the Vietnamese language, enabling users to express actions precisely and in detail within physical environments. Analyzing how motion verbs combine with manners and paths in Vietnamese provides us with deep insights into the diversity and richness of this language. Understanding these elements in the lexicalization of motion events within physical environments helps us gain a clearer understanding of how language shapes and expresses meaning within culture and society. However, it should be noted that this study focused solely on Vietnamese, and applying these findings to other languages may encounter certain challenges. Exploring how other languages lexicalize motion events within physical environments will require further research and detailed analysis.

Declaration

Declaration for Research: Lexicalization of Motion Events in Physical Environments from the Cognitive Perspective in Vietnamese

Ethical Approval:

This research project, focusing on the lexicalization of motion events in physical environments from a cognitive perspective in Vietnamese, was conducted with a strong commitment to ethical principles. Ethical approval for the study was obtained from the Institutional Review Board (IRB) at the University of Social Affairs to ensure the ethical treatment and protection of human participants involved in the study.

Consent to Participate:

Explicit informed consent was obtained from all human participants prior to their involvement in the research. Participants were provided with comprehensive information about the research objectives, procedures, potential risks, benefits, confidentiality measures, and their right to withdraw from the study at any time without any adverse consequences.

Consent to Publish:

All human participants were informed about the possibility of their anonymized data, quotations, or any identifiable information being used in scholarly articles, reports, or presentations. Written consent to publish such anonymized information was obtained from all participants to ensure transparency and respect for their rights.

Competing Interests:

The author of this research project, Ly Ngoc Toan, declares that there are no competing interests that could influence the integrity, objectivity, or impartiality of the research. There are no financial or personal conflicts of interest that may bias the findings or conclusions of this study.

Author's Contribution:

Ly Ngoc Toan is the sole author of this research and has contributed to all aspects of the study, including:

Conceptualization of the research design.

Data collection and analysis.

Interpretation of the findings.

Manuscript writing and review.

Funding:

This research project was not funded by any external funding source. All costs associated with the research, including research materials and data collection tools, were covered personally by the author, Ly Ngoc Toan, or through their affiliated institution, the University of Social Affairs, ensuring the independence and objectivity of the study.

Data Availability Statement:

Dataset Description: The dataset includes a diverse set of stories in Vietnamese that depict motion events in various physical environments. These stories have been carefully selected to cover a wide range of genres and contexts, ensuring a comprehensive representation of motion events in different scenarios.

Data Access: The dataset can be accessed through the following link: [<https://toplist.vn/top-list/nha-van-hien-thuc-phe-phan-noi-tieng-nhat-viet-nam-giai-doan-1930-1945-5867.htm#item46199>]. The repository contains the annotated data, motion verbs extracted from the annotated data, and the categorization of motion verbs based on their manner and path of motion.

Data Format: The dataset is provided in a structured and machine-readable format, allowing researchers to conduct further analyses and replicate the study's findings. It includes information on the manner and path of motion associated with each motion verb, as well as additional semantic characteristics.

Data Use and Citation: Researchers and interested parties are free to use the dataset for academic and non-commercial purposes. When utilizing the dataset, we kindly request proper acknowledgment and citation of the original article where the data was first introduced and the theoretical framework for the study.

Additional Data: For inquiries regarding additional data related to this study, researchers can contact [lytoandhcs75@gmail.com] for further assistance.

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