

Identifying Semantic Frames in Adventure Tourism (Short Paper)

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Abstract

This paper proposes a methodological approach to the identification of semantic frames (1, 2, 3) in the language of adventure tourism. This method is mirrored on the existing entries recorded in the specialized resource *DicoAdventure*, an online bilingual (English, Spanish) dictionary about adventure tourism. More specifically, annotated contexts and argument structures of motion verbs were compared to the descriptions and the frame elements of the entries collected in FrameNet insofar as it served as a reference point. A total of 13 semantic frames were discovered and most of them corresponded to frames already described in this database; however, some new ones also emerged. Additionally, some units were not included in FrameNet or, when they were, they evoked different frames depending on whether they referred to the general language (FrameNet) or the specialized language (*DicoAdventure*).

Keywords

adventure tourism, annotated context, argument structure, frame element, motion verb, semantic frame

1. Introduction

During the past two decades, Frame Semantics (1, 2, 3) and its application FrameNet (henceforth, FN) has drawn the attention of an increasing number of terminologists interested in developing specialized resources that represent the connection of specialized units with semantic frames. According to L'Homme et al. (4), semantic frames are especially attractive in terminology, since it is assumed that there is a connection between the conceptual structure of specialized fields of knowledge and the linguistic units used to convey this knowledge.

Compilers of domain-specific resources have either adhered closely to the methodology developed within the FN project or adapted it to achieve different objectives. Most recent examples of specialized domains for which resources based largely or loosely on Frame Semantics are aeronautics, linguistics, the environment, and sport, among others (cf. 4, 5, 6, 7, 8). In this paper, we propose a method for identifying semantic frames in the specialized domain of adventure tourism, an increasingly popular tourism segment which combines nature, risk, and adventure in a range of activities performed by tourists. This methodology follows –with some adjustments– the Frame Semantics principles and the FN methodology and is mirrored

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on existing entries of motion verbs included in *DicoAdventure*, a bilingual (English, Spanish) specialized dictionary about adventure tourism.

Taking into account the findings reported in previous studies (9, 10) as well as the assumption that frames are particularly useful when analyzing predicative terms (11), we focused on motion verbs² extracted from the ADVENCOR corpus, a specialized corpus about adventure tourism (12), and included in the *DicoAdventure* dictionary (cf. Section 2), to reach the goals of this study, which are: on the one hand, to discover the semantic frames that are evoked by motion verbs (representing either real or fictive motion) in this specific domain, and, on the other, to identify the different terms in English that are linked to those frames. As in previous studies (11), the source of information employed in *DicoAdventure* was not aimed at identifying frames and the terms that evoke them, but it is proved that these frames can be discovered in a subsequent phase according to the lexico-semantic properties of specialized units.

To do so, this work is structured as follows. Section 2 briefly describes the *DicoAdventure* resource, the source of information employed to identify the semantic frames evoked by motion verbs in adventure tourism. Section 3 presents the methodological approach, along with a description of the data that was used, and Section 4 discusses the most relevant results. Finally, we provide some concluding remarks and mention a few directions for future work in Section 5.

2. The *DicoAdventure* dictionary

The *DicoAdventure* dictionary is an online bilingual (English-Spanish) lexico-semantic specialized resource about the language used in adventure tourism freely available at <http://olst.ling.umontreal.ca/dicoadventure/> and still under construction.

The primary focus of the resource has been on motion verbs, representing both real and fictive motion, after having noticed that they overwhelmingly predominate in this domain (10, 13, 14). Besides, other types of concepts have also been recently included, especially nouns referring to adventure activities, such as *trekking*, *kayaking*, *canyoning*, or *climbing*.

All the entries gathered in the resource offer the same kind of information, which is divided into linguistic, pragmatic, and semantic, and can be easily visualized. Figure 1 below shows the entry for *abseil*₁ and contains: (1) the term itself (it comes with a number because there is an entry for every meaning conveyed; for example, we can find the entries *ascend*₁ and *ascend*₂ in which real motion and fictive motion are represented, respectively) together with its grammatical category, (2) definition and argument structure of the term, (3) linguistic realizations of the arguments and examples, (4) equivalents in the other language, (5) contexts of use, annotated contexts, and a summary of the annotations, and (6) conceptual relations with other terms (e.g., synonyms, collocations, different parts of speech, etc.). Additionally, some administrative information is included on the upper right corner of the entry together with a link to the top of the page, along with a picture which represents the definition of the term and facilitates the interpretation of its meaning.

² In this context, we consider motion verbs as “verbs describing a displacement of an entity, either a person or a thing, in space” (10).

abseil ₁ vt/vi [ID: 2018-09-05] [Top](#)

Definition Argument structure

A **TOURIST** goes down a waterfall (**DIRECTION**) or follows a **PATH** to the ground (**DESTINATION**) using a harness and ropes (**SAFETY_INSTRUMENT**) fixed at a higher point (**SOURCE**).

- NOTE 1. The verb "abseil" is preferred in British English (BrE), while the verb "rappel" is preferred in American English (AmE).

Linguistic realizations of arguments and examples

Click on the EX buttons to see examples found for the different arguments

Tourist	Path	Direction	Source	Destination	Safety_Instrument
abseiler climber mountaineerer	(rock) face descent waterfall	down down ~ into ~	top	base ground ledge	belay carabiner cord harness rope

Equivalents

Spanish

hacer rápel
hacer rapel
[destrear \(vt/vi\)](#)
[rapelar \(vt/vi\)](#)

Contexts Annotated contexts Summary

This fun and exciting 100% eco-friendly adventure tour will see you cliff-jumping, **abseiling** and canyoning down the crystal-clear waters of Behana Creek as it flows down the beautiful Behana Gorge, about 45 minutes drive south of Cairns. [ADVENCOR]

The certified instructors will help you **abseil** down the rocks making sure safety is the highest priority at all times. [ADVENCOR]


Zip line through bushland, **abseil** down cliff faces, go canyoning or climb iconic structures like the Sydney Harbour Bridge. [ADVENCOR]

Feel the intense rush as you engage in an outdoor paintball battle or take on the mountain as you **abseil** down vertical cliff faces or even take a leap bungee jumping. [ADVENCOR]

Experience one of the planet's longest free falls, jump, **abseil** and throw yourself down steep canyon walls. [ADVENCOR]

Synonyms of Related Meanings Collocations Different Parts of Speech and Derivatives

Explanation	Term
Geographical variant (preferred in AmE)	rapel (vt/vi)



Source: [Pxbere](#)

Figure 1: Entry for *abseil*₁ in *DicoAdventure*

For the purpose of this study, the most relevant part in this resource is the argument structure and the annotated contexts, which provide us with relevant information to discover and define the semantic frames embodied in adventure tourism; moreover, it allows us to identify the different terms belonging to these frames. The methodology followed is explained in the following section.

3. Methodology

To identify the semantic frames that were evoked by the motion verbs included in *DicoAdventure* we took the following steps:

1. We checked the terms in FN and considered the semantic frames assigned to them. For example, *head-v* is associated with SELF_MOTION and LEADERSHIP (cf. Figure 2).

Lexical unit search results: Closest match is head

Lexical Unit	Frame	LU Status	Lexical Entry Report	Annotation Report
head out.v	Getting_underway	Add_Annotation	LE	Anno
head.n	Leadership	FN1_Sent	LE	Anno
head.n	Body_parts	Finished_Initial	LE	Anno
head.v	Leadership	FN1_Sent	LE	Anno
head.v	Self_motion	Finished_Initial	LE	Anno

Figure 2: Semantic frames evoked by *head-v* in FN

2. We carried out an analysis of the description of the frames and the distinct elements they included –which can be classified as core (obligatory participants) or non-core (non-obligatory) participants–, and selected the most convenient for our purpose. For the case of *head-v* in adventure tourism, the corresponding frame was SELF_MOTION.
3. We analyzed the argument structure and the annotated contexts of the occurrences of the verbs in the *DicoAdventure* resource and concluded whether the semantic frames identified in FN could also be used in our specific domain or, on the contrary, a new frame was required. If the former situation arose, the frame was used and its name adapted (if necessary); this is the case of the frame SELF_MOTION. In contrast, if there was the need to create a new frame, this was proposed and named according to the information extracted from *DicoAdventure*, such as the frame MOTION_FROM_SOURCE, which includes motion verbs with a focus on the origin of the motion and does not exist in FN.

Along with the identification of frames, we assessed the different motion verbs that evoked the same semantic frame according to the following criteria established by the FN methodology (15):

- The units should have the same number of arguments (both explicit and implicit).
- The units should have the same type of arguments (both explicit and implicit).
- The units should denote the same part of scene.
- The units should have the same relations, both within the frame elements and with background frames.
- The units should have the same frame element profiling.

As can be observed, contrary to the FN methodology, here the semantic frames (as well as the terms evoking them) were discovered after the terms were examined in the annotated contexts in *DicoAdventure*, instead of being postulated prior to the descriptive work. Besides, labels used for most obligatory elements in the semantic frames were different in both resources, since *DicoAdventure* employs specific labels for the adventure tourism language, such as TOURIST or DESTINATION. Nevertheless, we considered that the labels were equivalent if their referent was the same. Thus, AGENT was considered to correspond to TOURIST in *DicoAdventure*, DESTINATION to GOAL, and AREA to PLACE.

The following section provides the most relevant findings after the implementation of this methodology.

4. Semantic frames in *DicoAdventure*

As mentioned above, the information collected in the FN database served as a reference point to define the semantic frames evoked by the motion verbs included in *DicoAdventure*. This database provided a robust foundation for understanding the meanings of verbs, enhancing comprehension of how knowledge is structured within adventure tourism. However, it is crucial to note that, while this resource was valuable, it could not address all the needs identified in studying adventure tourism's specialized discourse, as FN represents the general language.

Consequently, some tailored frames were established to conduct a more comprehensive analysis and to meet the specific requirements of this specialized language.

As a way of example, we provide the description of the semantic frame SELF_MOTION in FN (cf. Figure 3) and the argument structure of *head*₁ in *DicoAdventure* (cf. Figure 4), since, according to FN, the verb *head-v* evokes this frame. Following the FN proposal, the same name of the frame is also used in *DicoAdventure*. Nonetheless, when we look closer at the obligatory elements in the units, differences regarding the name of the semantic roles are found because of the specialization of the verb in *DicoAdventure*, that is, some elements are named differently, such as SELF_MOVER in FN and TOURIST in *DicoAdventure*, AREA in FN and PLACE in *DicoAdventure*, or GOAL in FN and DESTINATION in *DicoAdventure*. Therefore, even though the same frame can be used in the adventure tourism resource, some adjustments are required to match the specifications of the specialized domain.

Figure 3: Description of the semantic frame SELF_MOTION in FN

Figure 4: Argument structure of *head*₁ in *DicoAdventure*

After the implementation of the described methodology, a total of 13 semantic frames were unearthed (cf. Table 1).

Table 1

Semantic frames evoked by the motion verbs in *DicoAdventure* (current version)

ARRIVING	MOTION_DIRECTIONAL	SELF_MOTION
CAUSE_MOTION	MOTION_FROM_SOURCE	SELF_MOTION_WITH_SAFETY_INSTRUMENT
CAUSE_TO_LAND	OPERATE_VEHICLE	TRAVERSING
DEPARTING	PATH_SHAPE	
MOTION	RIDE_VEHICLE	

Most of these frames were found in FN and their designation was taken from it. Only two showed no correspondence in the resource and new semantic frames were suggested for the domain of adventure tourism, namely MOTION_FROM_SOURCE and SELF_MOTION_WITH_SAFETY_INSTRUMENT. For their part, when looking at the units that evoke those frames (cf. Appendix), three different situations were observed:

1. The units were exactly the same and evoked the same frame, such as in ARRIVING or DEPARTING, although the obligatory elements were named differently (e.g., GOAL in FN and DESTINATION in *DicoAdventure*).
2. The units evoked different frames in each resource, such as *climb-v*, *disembark-v*, or *slide-v*.
3. Some units were not included in a semantic frame available in FN, such as *kayak-v* or *skydive-v*.

Table 2 shows the number of units that represent these three different situations.

Table 2
Analysis of results

Category	Number of units
Same frame	37
Different frame	11
No frame in FN	9
TOTAL	57

The analysis reveals interesting findings about how situations that would appear to be similar can be conceptualized differently in everyday language (as represented in FN) and in specialized situations (as evidenced by the data collected in *DicoAdventure*), such as the facts that most of the identified frames are found in FN despite having different frame elements or that new frames are required to be created.

As an illustration, *paddle-v* is categorized within the semantic frame OPERATE_VEHICLE in both FN and *DicoAdventure*. Nonetheless, despite belonging to the same frame, we must point out the different uses of the verb in every resource. Considering the information provided in FN, the words gathered in this frame involve motion that requires a vehicle and someone who controls it. One of the core elements highlighted is PATH, which refers to the trajectory of motion and includes directional expressions and “middle of path” expressions, encapsulated in constructions where the verb functions as an intransitive verb. Up to here, the notion of OPERATE_VEHICLE in *DicoAdventure* is exactly the same. However, regarding the frame element PATH, specific contexts belonging to the domain of adventure tourism show that *paddle-v* can also be used transitively when this is followed by a path (demonstrating the special behavior of this verb in the specialized discourse), such as *You can experience unforgettable outdoor activities, scale heights, **paddle the river** and explore underground [ADVENCOR]*. For its part, the only transitive uses of this verb in the general language, as depicted in both FN and the definition of this verbal unit in the *Collins Dictionary*,³ only includes the vehicle that is operated in the direct object position (e.g., *Tim **drove his car** all the way across North America [FN]*, just like *DicoAdventure* also does (e.g., *... then navigate a course around obstacles or **paddle your raft** to an island for a picnic! [ADVENCOR]*).

Another key point is the fact that the same unit can evoke different frames in the two types of language, that is, general (FN) or specialized (*DicoAdventure*). Thus, *disembark-v* is included

³ <https://www.collinsdictionary.com/dictionary/english/paddle> [Last accessed: 16/03/2024].

in the semantic frame DISEMBARKING in FN, which is defined as “A TRAVELLER leaves from or dismounts a VEHICLE”. Comparatively, this definition is the one that we hold after exploring the annotated contexts gathered in *DicoAdventure*. Nevertheless, our main focus in the specialized domain under study is on the starting point of a motion as emphasized in the definition itself, so we consider that this verb fits better into the abovementioned ad hoc frame MOTION_FROM_SOURCE. Two other verbs belong to this frame too, namely *jump-v* and *launch-v*, both of which evoke a distinct frame in FN, to know, SELF_MOTION and CAUSE_MOTION, respectively. A similar case is the verb *slide-v*, included in the semantic frame MOTION in FN, it being defined as “Some entity (THEME) starts out in one place (SOURCE) and ends up in some other place (GOAL), having covered some space between the two (PATH)”. However, from this definition we can infer that THEME (i.e., the entity moving) is the most prominent element in the situation, therefore, we can safely assume that categorizing *slide-v* as a unit evoking the semantic frame SELF_MOTION is perfectly suitable in the context of adventure tourism. In fact, FN defines this frame as “The SELF_MOVER, a living being, moves under its own direction along a PATH”, which is precisely what specialized contexts show, for instance, *Book canyoning if you like the idea of jumping off the rocks and **sliding** down the waterfalls* [ADVENCOR]. This doubleness seems to emerge from the distinction between a non-living entity and a human being moving themselves, conceived of in FN.

Finally, we must also mention those specialized units that were not collected in FN. A couple of examples are *skydive-v*⁴ and *navigate-v*, which are included in the SELF_MOTION and OPERATE_VEHICLE frames in *DicoAdventure*, respectively. Again, this categorization means that the emphasis in *skydive-v* is on the entity performing the motion (which is at the same time the one moving; e.g., *At the top of the South Island you can **skydive** over the Abel Tasman national park* [ADVENCOR]), on the one hand, and on the vehicle needed when the motion takes place, reflected in *navigate-v*, on the other. As for *navigate-v*, unlike the case of *paddle-v* previously mentioned, the general language also makes use of this verb as a transitive one with a path in the direct object position as well as the vehicle itself.⁵ It also occurs in the specialized domain of adventure tourism, as represented in the following examples extracted from ADVENCOR: *Feel your adrenaline pumping as you **navigate powerful rapids and white water**; ... you will find lots of people who know how to **navigate a canoe*** Nevertheless, in this specialized language the presence of a path is stronger than the presence of a vehicle after the verb in the direct object position, as observed in the contexts retrieved from the corpus (cf. Figure 5).

⁴ In fact, *skydive-v* was shown to enjoy the highest keyness score in the language of adventure tourism, that is, the most typical one in this specialized discourse (16).

⁵ <https://www.collinsdictionary.com/dictionary/english/navigate> (second meaning provided). [Last accessed: 16/03/2024].

Left context	KWIC	Right context
er Rafting Rafting, the high-adrenaline sport of	navigating	a river in an inflatable raft, involves several leve
nto crystal clear pools, zipline over native bush,	navigate	through narrow passageways and slide down c
hitney will force you to traverse river crossings,	navigate	97 switchbacks and slick boulders, and make y
ssive upper-body workout from paddling as you	navigate	the tumultuous waters.</s><s>Splash alert: Yo
n lines.</s><s>It's aerodynamic structure helps	navigating	the pressure of the air and the wind forces, abc
ter sport, involving the use of inflatable rafts to	navigate	the swirling waters (called rapids) of a river, is r
g stick can take pressure off of sore joints, help	navigate	boulder fields and ease steep ascents and des
e Walking paths and trails are generally safe to	navigate	, but can be unstable in certain conditions or if
ad more Trekking poles help ease the strain of	navigating	rough and uneven terrain.</s><s>They can also
le trails, you'll have a wide variety of features to	navigate	over the course of the tour.</s><s>Your friendl
r time in a kayak.</s><s>If you are interested in	navigating	the Rock Creek Cove just below the lodge they
ging nets, crossing wobbly suspended bridges,	navigating	swinging logs, balancing on skate boards and
re mention Giant Zip Lines?</s><s>BOOK NOW	Navigate	All 4 Courses!</s><s>Use your skills and sense
urses!</s><s>Use your skills and senses as you	navigate	Tree Trek's 4 increasingly challenging obstacle
tart on Green and finish on Red.</s><s>Juniors	navigate	from Green through Silver.</s><s>Come out an
ional outdoor activity using an inflatable raft to	navigate	a river or other bodies of water.</s><s>This is t

Figure 5: Sample of contexts containing *navigate-v* in ADVENCOR

5. Conclusions

This work proposed a bottom-up methodology to discover semantic frames in a specialized domain, adventure tourism, taking the English version of FN as a reference point. After a thorough analysis of 57 motion verbs in the language of adventure tourism in English following the described methodology, 13 semantic frames were identified.

The results show that most of the motion verbs studied (37) could be assigned to existing frames in FN, such as SELF_MOTION, ARRIVING, or DEPARTING; for others (9), new frames were suggested, for instance, SELF_MOTION_WITH_SAFETY_INSTRUMENT. Furthermore, some units (11) were required to be re-allocated, that is, they evoked different semantic frames depending on whether they referred to the general language (in FN) or the specialized language (in *DicoAdventure*), like *disembark-v* or *slide-v*. The underlying motivation for re-allocating these verbs was the focus on the definition of the frames, that is, the starting point of the motion in *disembark-v* and the entity moving in *slide-v*, regardless of their humanness status. Finally, there were some units that were not included in FN because of their specialized meaning, such as *skydive-v* or *navigate-v*, and, therefore, we were not able to compare the frames evoked.

All in all, the *DicoAdventure* dictionary is still under construction and this will lead to the discovery of additional frames in the future, some of which will correspond to existing frames, some of which will be new. Added to that, relations between frames already identified can be perceived intuitively (e.g., SELF_MOTION and SELF_MOTION_WITH_SAFETY_INSTRUMENT), but we will further need to investigate this. As to the advantages offered by the methodological approach explained in this paper, we believe that it can be of great help to terminologists and terminology work insofar as it contributes to the distinction between verbs that represent concepts, that is, meanings conveyed in specialized languages, from verbs and their meanings in the general language, as shown with the uses of the verb *paddle-v* in Section 4.

Last but not least, it is worth mentioning some of the implications of this study. First, one of them is connected with the Spanish language, as this is also included in *DicoAdventure* at

present. So far, the method shown in the previous pages has only been applied to the analysis of the entries collected in *DicoAdventure* in the English language, so the frames evoked by Spanish verbs are also to be explored and compared to the English results. Second, one more implication might be to employ this methodology to study other specialized domains that have not been covered yet, so we hope it can inspire other similar investigations in the future.

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A. Appendix

	Semantic frame	Motion verb		Semantic frame	Motion verb		
1.	OPERATE_VEHICLE	<i>bike₁-v</i>			<i>scramble₁-v</i>		
		<i>drive₁-v</i>			<i>skydive₁-v</i>		
		<i>fly₁-v</i>			<i>slide₁-v</i>		
		<i>glide₁-v</i>			<i>swim₁-v</i>		
		<i>navigate₁-v</i>			<i>trek₁-v</i>		
		<i>paddle₁-v</i>			<i>venture₁-v</i>		
		<i>ride₁-v</i>			<i>walk₁-v</i>		
		<i>kayak₁-v</i>			3.	PATH_SHAPE	<i>ascend₂-v</i>
		<i>raft₁-v</i>					<i>climb₂-v</i>
		<i>ski₁-v</i>					<i>cross₂-v</i>
		<i>surf₁-v</i>					<i>descend₂-v</i>
2.	SELF_MOTION	<i>dive₁-v</i>			<i>head₂-v</i>		
		<i>head₁-v</i>			<i>lead₁-v</i>		
		<i>hike₁-v</i>			<i>leave₂-v</i>		

	Semantic frame	Motion verb
		<i>run₂-v</i>
4.	ARRIVING	<i>arrive₁-v</i>
		<i>enter₁-v</i>
		<i>approach₁-v</i>
		<i>reach₁-v</i>
		<i>return₁-v</i>
5.	MOTION_DIRECTIONAL	<i>ascend₁-v</i>
		<i>descend₁-v</i>
		<i>fall_{1,2}-v</i>
6.	SELF_MOTION_WITH_SAFETY_INSTRUMENT	<i>abseil₁-v</i>
		<i>climb₁-v</i>
		<i>rappel₁-v</i>
		<i>scale₁-v</i>
7.	MOTION	<i>float₁-v</i>
		<i>move₁-v</i>

	Semantic frame	Motion verb
		<i>soar₁-v</i>
8.	TRAVERSING	<i>cross₁-v</i>
		<i>pass₁-v</i>
		<i>traverse₁-v</i>
9.	CAUSE_TO_LAND	<i>land₁-v</i>
10.	DEPARTING	<i>exit₁-v</i>
		<i>depart₁-v</i>
		<i>leave₁-v</i>
11.	MOTION_FROM_SOURCE	<i>jump₁-v</i>
		<i>disembark₁-v</i>
		<i>launch₁-v</i>
12.	RIDE_VEHICLE	<i>ride₂-v</i>
		<i>zip₁-v</i>
13.	CAUSE_MOTION	<i>pull₁-v</i>