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# Representing and Redefining Specialised Knowledge: Variety in LSP

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# Contents

*Adequacy, meaning construction and discursive conventions*

DANIELA CESIRI

# Knowledge Dissemination in Paleontology. A Case Study from the Animated Series *Dinosaur Train*

## 1. Introduction

Paleontology is defined as "the science of prehistoric life – of the fauna and flora of the geologic past" (Schindewolf 1993: 1), thus it presents itself as a complex, hybrid domain that combines methods of analysis from a wide range of disciplines, from the hard sciences in order to investigate ancient fossils, to the arts – and even computer science – in order to create realistic reconstructions of the aspect and living environment of dinosaurs, which are at the core of the discipline itself.

Paleontology is a domain that is also extremely popular among the general public, since "dinosaurs embody the drastic changes that life on Earth has undergone. Chasing after dinosaurs is really a quest to fill in part of our own backstory" (Switek 2014). This popularity creates specific expectations in the public, who wants to receive a reliable as well as enjoyable representation of their favorite prehistoric creatures. Children, in particular, are enthusiastic about dinosaurs as is demonstrated by merchandise of all sorts, dedicated exhibitions, children's narrative and syllabus books, movies, and TV programs. In cases such as these, dinosaurs are often anthropomorphized so that children can easily identify with them. The characterization of dinosaurs is thus the work of creative experts but, most importantly, of the actual paleontologists who dig out the fossils, reconstruct and study scientifically the aspect and the lives of these extinct animals, and who often work as consultants for the entertainment or the

publishing industries. It is for this reason, then, that any product for children concerning dinosaurs is to be seen as a complex creation as well as a very peculiar kind of dissemination of scientific knowledge which, from the experts, is mediated to the young public through shows, books, and media in general.

The present study analyzes how specialist knowledge regarding dinosaurs is transmitted to preschool children. To do so, the animated series *Dinosaur Train* (aired by the American PBS) is investigated. One part of a representative episode is analyzed in order to identify the verbal and visual strategies that are used to communicate complex scientific knowledge to young children, making Paleontology engaging and educational at the same time. The visual aspects are investigated using Baldry/Thibault's (2006) tools for multimedia analysis, while the verbal features are examined in the context of already existing literature on knowledge dissemination (KD).

## 2. Knowledge dissemination to children

KD practices, especially when targeting lay audiences, consist in "a vast class of various types of communicative events or genres that involve the transformation of specialized knowledge into 'everyday' or 'lay' knowledge, as well as a recontextualization of scientific discourse" (Calsamiglia/Van Dijk 2004: 370). The recourse to those resources is also known as popularization. The process of popularizing scientific contents implies a certain degree of recontextualization and reformulation which stems from the very purpose that lies at the basis of popularizing texts themselves. KD might indeed have an informational purpose, when the audience is informed about certain scientific facts or is updated on new discoveries that change previous or common knowledge (e.g., in the case of newspaper/magazine articles, documentaries, etc.). Another purpose might be pedagogical, when the audience of non-experts is taught specialized knowledge, usually in formal teaching situations in all the stages of the education

system. A certain degree of pedagogical implications is also present in KD for informational purposes. In this case the main difference between the two communicative contexts lies in the way the non-experts will use the information provided in. In the case of KD for informational purposes, the facts conveyed are used to increase common knowledge in order to help people make sense of the world, of human behavior and society. In the case of KD for pedagogical purposes, scientific knowledge is used by pupils and students to build a whole set of cognitive tools through which to make sense of the world and be able to interpret specialized information.

Another element which is taken into account by KD is the targeted audience and their (presumed) knowledge of the topic/domain. This factor greatly influences the choices of the communicative strategies by which a scientific fact is popularized. Indeed, decisions in this case do not lie as much in the amount of knowledge to be popularized, but rather in how the popularization is carried out. Consider, for example, KD for adults and KD for children. Conveying complex, specialized concepts to adults involves a certain degree of knowledge that they are expected to possess because of their education, previous readings, or simply because of their experience of the real world. In the case of KD aimed at children, this previous knowledge cannot be expected, since children are at the early stages of their education and have limited experience of/in life. In the case of preschoolers, the category considered in this study, the amount of previous knowledge/experience is even more limited given their very young age.

The literature concerning KD aimed at children is relatively limited. While some studies have investigated the strategies employed to disseminate legal knowledge to young audiences (e.g., Engberg/Luttermann 2014; Sorrentino 2014; Diani 2015, 2018), existing literature chiefly addresses methods on how to teach the theoretical aspects of the hard sciences (such as mathematics, physics, chemistry, biology, and so forth) as well as their practical application to experiments and real life (Curtis 1998; Hong/Diamond 2012; Fusaro/Smith 2018). So far, no linguistic study – to the knowledge of the present author – has yet attempted at investigating the linguistic,

discursive, or pragmatic features that characterize the popularization of scientific discourse to preschoolers or to children in primary school.

### *2.1. Educational TV shows and the use of dinosaurs*

An approach similar to that described for formal teaching in the studies mentioned above is to be found in educational TV programs. In fact, according to Coccetta (2016: 66),

> these shows follow a similar format where TV characters have to deal with a problem and encourage the viewers to actively engage in its solution. Research (e.g. Kirkorian/Wartella/Anderson 2008; Tizard/Hughes 2008) has demonstrated that preschoolers benefit from these shows because the presentation of problem-solving situations and the direct interaction between the TV characters and the viewers stimulate the development of the latter's basic skills in literacy and mathematics as well as their social skills.

The actual educational impact of these programs has widely been debated among experts: on the one hand, we find those who have expressed criticism (Fisch 2005 mentions, for instance, John 1999; Kunkel 2001; Wilson *et al.* 1997); on the other hand, extensive literature has stressed the programs' positive effect on developing literacy skills and scientific thinking and problem-solving (cf. Fisch 2000: 63-64).

As regards the use of dinosaurs, despite their vast success among children of all ages, it must be said that the prehistoric beasts do not find a real place in research on the teaching of science. They are used in Poling/Evans (2004: 364) to measure "children's understanding of extinction and of death", while other studies use their 'anthropomorphized' or 'cartoonized' versions only as a means to teach children various skills not related to scientific KD, such as social and emotional competence (Joseph/Strain 2003; Webster-Stratton/Reid 2005). On the contrary, if we consider the plethora of TV programs, books, and documentaries for children, dinosaurs are among the major protagonists. For instance, an exploratory Wikipedia query produces 57 pages under the search string 'Television series

about dinosaurs', which testifies the enormous interest that dinosaurs generate in the 'edutainment' business.

## 3. Material and methods of analysis

The analysis of the *Dinosaur Train* series is divided into two parts: first, the visual analysis starts from a multimodal transcription of one sample episode (chosen as representative for the series) in order to investigate patterns and strategies in terms of visual structure and graphic elements. Then, the verbal component is analyzed in order to identify the linguistic features that characterize scientific discourse in the series, and how they contribute to the popularity of the series, in the US and abroad, even though the episodes deal with such a complex discipline as Paleontology presented to preschoolers.

### *3.1. The* Dinosaur Train *animated series*

The animated series *Dinosaur Train* is broadcast by PBS, the brand of the US Public Broadcasting Service dedicated to children's edutainment. The series, in particular, is produced by The Jim Henson Company, which is known worldwide for animated and non-animated entertainment programs, such as *The Muppets*, *The Wubbulous World of Dr. Seuss*, and the iconic movies *The Dark Crystal* that features animatronic creatures (cf. <https://www.henson.com/>) and *Labyrinth* which combines animatronic creatures and real actors (such as actor and singer David Bowie). The series here investigated, *Dinosaur Train*, is unique in its own genre since it does not show the interaction between animated characters and real actors; it rather shows a combination of animated and live-action segments with a real paleontologist, Dr Scott Sampson (fieldwork paleontologist, and president and CEO of Science World British Columbia in Vancouver, BC).

The series was first aired in 2009 and has reached, today, its fourth season (cf. <http://www.pbs.org/parents/dinosaurtrain/>). The target public of the series are preschool children, aged three to six. In fact,

> *Dinosaur Train* embraces and celebrates the fascination that preschoolers have with both dinosaurs and trains, while encouraging basic scientific thinking skills as the audience learns about life science, natural history and paleontology. (http://www.pbs.org/parents/dinosaurtrain/about/)

The main plot tells the story of Buddy, a young Tyrannosaurus Rex of the same age as the target public, who is adopted by a family of Pteranodons. With its adopted parents and siblings Buddy travels in each episode to several prehistoric lands and eras, using a special train, the Dinosaur Train of the title, which

> is a colorful locomotive, customized to accommodate all kinds of dinosaurs. […] The Dinosaur Train has the ability to visit the Triassic, Jurassic and Cretaceous worlds, while the Train's Conductor, a knowledgeable Troodon, provides passengers with cool facts about dinosaurs along the way. (http://www.pbs.org/parents/dinosaurtrain/about/)

The edutainment structure of the series is complex and is constructed to attract the young audience's attention since children can identify themselves with Buddy and his siblings as they have the same age and 'inquisitiveness' (Fusaro/Smith 2018). Children enjoy the reassuring presence of parental figures (the Pteranodon parents) as well as of teacher-like models in the Train Conductor and, above all, in Dr Scott Sampson. In addition, the series mixes fantasy and real facts since the train travels across eras and prehistorical continents, which are depicted and described realistically, while using funny characters and vivid colors, suitable for children of such a young age.

Different scientific aspects are developed in each season of the series: in fact, the series features Earth Science as a broad domain but each season explores different aspects related to prehistorical eras, fauna and flora, dealing with current issues such as biodiversity, extreme weather and climate change, the importance of eco-systems, geology, and so forth. The episodes also deal with topics familiar to

the children's everyday lives (e.g. weekend activities with the family such as camping and picnics but also social diversity and acceptance, important steps in the process of growing-up, etc.). Finally, the series has a 'companion' website (<http://pbskids.org/dinosaurtrain/>) with specific, interactive sections designed for children, parents, and teachers.

Each season is composed of 89 episodes, each of which lasts around 30 minutes. The structure of each episode is the same in every season: two animated stories of eleven minutes each develop the main topic of the episode and are separated by a short live-action segment (lasting around one minute and 30 seconds) featuring Dr Scott Sampson who describes the aspect, behavior and natural habitat of the dinosaurs seen in each episode. Considering the repeating structure of the episodes, and for space constraints, the present chapter shows the results from the analysis of one episode, taken as representative of the whole season and, by extension, of the whole series.

## 4. Visual analysis

### *4.1. Methodology*

The episode here investigated is taken from Season 1 of the series; the analysis focuses in particular on the short live-action segment, which is clearly identifiable as the moment in which specialist knowledge is explicitly popularized to children. The visual component of the segment was investigated using Baldry/Thibault's (2006: 47) phasal analysis for the transcription of film texts, in which phases are defined as "text-analytical units in terms of which the text as a whole can be segmented and analyzed". Consequently,

> phases are the basic strategic meaning-making units in a film text […]. A multimodal transcription of a film text reconstructs the way information is divided into block and the way these blocks relate to metafunctional organization and the constant changes in this metafunctional organization as

> the text flows in time […]. Transcription can thus help us identify many elements in a film text and suggest the way they integrate to make meaning. (Baldry/Thibault 2006: 49)

Phasal analysis, then, considers the synchronic as well as the diachronic dimension of the 'film text' investigated, and it "shows how *small-scale* units […] can be related to *larger-scale* textual units" (Baldry/Thibault 2006: 50, italics as in the original). In the present case, the phasal analysis facilitates the identification of specific units in the live-action segment that, alone, mark a specific moment in the description of the dinosaur and that, together, characterize the KD phase present in each episode of the series.

| **Phases** | **Description of Phases** | **Macrophases** |
|---|---|---|
| Phase 1 | Opening theme song with specific animation and opening credits. | Macrophase 1 |
| Phase 2 | The Train Conductor anticipates the topic of the episode. | |
| Phase 3 | The family starts the day with some everyday event/activity. This prompts the journey in the episode. | |
| Phase 4 | The family boards the train and the Train Conductor introduces their journey (essential information on era, species, etc.). | |
| Phase 5 | First 11' animated story. | Macrophase 2 |
| Phase 6 | Dr Scott (with real children and animations) gives more detailed information on dinosaurs/eras/species evolution. | Macrophase 3 |
| Phase 7 | Second 11' animated story with funny conclusion of the episode | Macrophase 4 |
| Phase 8 | Closing theme song with end credits | Endphase |

Table 1. Phasal Analysis.

The multimodal transcription started with a phasal analysis of the episode. Table 1 shows that the episodes in the series are generally composed of eight phases which, in turn, are part of four Macrophases and one Endphase. The live-action segment is positioned in Macrophase 3, Phase 6, approximately halfway through the entire episode, marking a division between the two animated stories. As already mentioned, this is the moment of real KD present in the episode and it is pivotal to explain children what they are actually watching, the aspect and behaviour of the dinosaurs in the episode, which are both functional to the development of the storyline of the episode itself. In addition, Phase 6 is also used to move on to the second part of the animated story and, most importantly, to contextualize the episode scientifically, thus teaching children since an early age what the scientific method of research consists in, and what actually lies behind every scientific discovery.

The multimodal transcription of the live-action segment was conducted adapting Baldry/Thibault's (2006) and Coccetta's (2016) multimodal transcription method. The elements considered for the segment are not only the individual frames grouped per phase but also the identification of participants and processes showed in the scene. Other elements included in the analysis of each frame and phase are the linguistic component of the script (investigated in greater detail in Section 5), the sounds and the soundtrack accompanying the script, as well as kinesic and proxemic elements, namely body movements and how participants use the space for communication between themselves and the viewers. Each of these elements was considered as a factor which could possibly influence meaning-making in each frame.

The tabular organization of the transcription allows the parallel breakdown of all the elements composing each frame. In the table used for the transcription, represented in Figure 1, the column named 'Sequence' indicates the sequence of frames that compose that particular part of the live-action segment. The column labeled 'Frames' shows the main frame representing the specific sequence, while 'Participants & Processes' describes what is depicted and what is represented in the frame. According to Halliday/Matthiessen (2004), in the Systemic-Functional model, the representation of reality

consists of processes, participants, and circumstances. A process is the event or the state that is being observed, while participants are defined as all the 'entities' that are involved in the process. Circumstances specify when, where, why and how a process happens. All these elements were taken into consideration in the multimodal transcription of the segment. The column indicated as 'Language' contains the verbal transcription of what is being said in each frame, while 'Sound' provides information on the music and soundtrack that accompany the specific frame. Finally, the column 'Kinesics and Proxemics' contains information on the body movements of those who appear in each frame and how they contribute to the meaning-making of the sequence, along with sound, music, and language. For space constraints, it is not possible to show here the full transcription of the segment, however Figure 1 illustrates a sample of the methodology used.

| SEQUENCE | FRAMES | PARTICIPANTS & PROCESSES | LANGUAGE | SOUND | KINESICS & PROXEMICS |
|---|---|---|---|---|---|
| 1→6 |  | Dr Scott looks at the kids with a picture of Velociraptor in the background. The kids look at different directions | | Background tune | Dr Scott's gaze directed at kids. He stands in a relaxed, friendly position. Kids stare at different directions. They stand distractedly. |
| 7→14 |  | Dr Scott turns to the public. Kids turn to Dr Scott except one. | Dr Scott: Hi! | ↓ | Dr Scott's and one of the kids' gaze is directed at viewers. The other kids stare at Dr Scott |

Figure 1. Example of the multimodal transcription of the live-action segment.

### *4.2. The live-action segment*

The multimodal transcription of the segment allowed the identification of a circular, recurrent structure, which characterizes also the other live-action segments in the series. First, Dr Scott Sampson appears standing on a white background, together with a small group of children who stand beside him, and a color picture of the dinosaur

described in the segment. After a brief salutation which is the same in every episode ('Hi! I'm Dr Scott, the paleontologist'), he immediately proceeds with the enunciation of facts on the specific dinosaur. In this frame (Figure 2) Dr Scott appears in full figure, alone or with the children, or in half-figure alone.

Figure 2. Dr Scott and the children.

The next sequence shows Dr Scott asking specific questions to the children, who eagerly reply. As illustrated in Figure 3, they are all shown in half-figure alone, separately (i.e., first the camera shows Dr Scott and then the children), their gazes are all directed at the viewers, with no real direct contact with each other. Then, more facts follow narrated by the paleontologist shown again alone in full or half-figure.

Figure 3. Dr Scott asks questions and a child replies.

The following sequence sees the entrance of a different character (Figure 4): a man dressed formally with a dark suit and a matching hat, showing a serious face. He enters through a computer-generated door, steps with a rigid posture into the space shared by Dr Scott and the children (who are not visible in the scene), raises one hand, uttering "Point of fact!", and remarks a strictly scientific piece of information about the dinosaur that spoils the children's enthusiasm for a funny, non-scientific remark told by Dr Scott a moment earlier.

Figure 4. Dr Scott and the Man with the Hat's entrance.

Children react to the man's serious remarks with exclamations of disappointment, while the man exits through the same door that disappears from the scene. The comic moment lies in the contrast with the informal and relaxed setting represented by Dr Scott and the children, and the very formal and serious attitude of the man with the hat. This allows Dr Scott to move on to the next sequence, in which he is shown alone in half or full figure, adding more funny facts that restore the informal atmosphere and the children's enthusiasm.

Then, a real moment of direct interaction between Dr Scott and the children is shown: Dr Scott asks direct questions to the children, looking at them, and the children first look at Dr Scott (Figure 5) and then reply to his questions but gazing again at the viewer's direction.

Figure 5. Dr Scott and the children interact.

The final sequence in the live-action segment (Figure 6) is a repetition of the initial sequence. Dr Scott is alone again, shown in half-figure against the white background with the static picture of the dinosaur close to his shoulder. He greets the public using the same formula in each episode ("Well, that's all for now. Keep watching for more dinosaur discoveries!"); in other segments from other episodes he also adds some remarks to remind the public to continue watching the series as well as to visit the series' website.

Figure 6. Dr Scott's closes the segment and greets the public.

### *4.3. Discussion*

The analysis of the multimodal transcription sheds light on some interesting elements that, as already remarked about the general composition of the series, reveal a recurrent pattern and a circular structure in the episodes as well as in the live-action segments. For instance, the background in the segment is most of the time white except for the static drawing of a dinosaur. The picture of the dinosaur always appears in the background in vivid colors: it is a realistic

representation but is drawn in a cartoon-like style that suits the public's young and impressionable age. The children always wear colorful shirts even though the group of children varies in each episode and they wear different clothes, while Dr Scott always wears the same plain, brownish button-up shirt with matching trousers, as shown in Figures 2 to 6.

The gazes of the humans are always directed at the viewer: while Dr Scott gazes at the children only at the beginning and at the end of the segment, the children gaze only occasionally at Dr Scott: they keep their gaze directed at the viewer even when they need to answer Dr Scott's direct questions. While he talks, Dr Scott gesticulates to remark his statements, which further stresses the importance given to body movements. The soundtrack is perceptible only in the background and is only occasionally used to stress a topical moment in the live-action segment. These acoustic elements (i.e., music and sounds) seem not to be complementary to Dr Scott's verbal narration as one would have expected. Indeed, this is an exception to what is usually found in shows aiming at preschoolers where the young children's natural attraction for audiovisual products rich in music and sounds is extensively exploited (cf. Porta/Herrera 2017). It could be hypothesized that the live-action segment is used to counterbalance the cartoon atmosphere of the animated parts, that are rich in music and sounds, and full of vivid colors. This is also confirmed by the linguistic features found in the verbal analysis of the script.

## 5. Verbal component

### *5.1. Literature review and methodology*

KD of scientific discourse has long been of interest to linguists and discourse analysts who have investigated not only the elements that distinguish a strictly scientific text from a popularizing one but also

the latter's intrinsic features as a genre. Gotti (2003, 2013) affirms that popularization is often compared to the process of translation since in both cases a source text is redrafted into a target text. Moreover, Calsamiglia/Van Dijk (2004) defines KD as recontextualization of scientific information into something which is made accessible to the lay public. In any case, KD includes a transformation of the source (specialist) into target (popularized) material. This transformation can be both intra- and intersemiotic in that it can involve the transformation of a text into another text as well as a change in the channel through which popularized knowledge is disseminated. For instance, the *Dinosaur Train* series transforms scientific knowledge usually communicated in written texts (research papers or monographs) into an audiovisual product that uses important visual choices to attract the young public's attention and to effectively convey reliable scientific information.

This section considers the verbal features typical of KD and analyzes how they are adapted in the series to suit the public of preschoolers. The script of the live-action segment was manually searched to identify its distinctive KD features using, for reference, the linguistic-discursive strategies typical of popularization as they have been indicated in the relevant literature (see Section 2 above and the present section).

### *5.2. Analysis*

The linguistic analysis of the live-action segment reveals that the script contains most of the features typical of KD as they are identified by Gotti (2003, 2013). For instance, Dr Scott Sampson – who is a real paleontologist working in fieldwork research – does not make reference to individual scholars but to the general community of scientists, as in example (1):

(1) We used to think that dinosaurs were covered with scales.

The use of an 'inclusive *we*' communicates to the children that Dr Scott is included in the scientific community of paleontologists; thus he positions himself as an expert, a reliable source of information. Moreover, tentative expressions (in italics in the examples below) can perform various functions: for instance, as exemplified in (2), they are used with a hedging function to lessen the force of a statement and to catch the children's attention, signaling that something new to them is being introduced. The tentative expression in examples (3) and (4), on the other hand, is used to transmit a certain degree of approximation, telling the children that, considering the evidence gathered by Paleontologists up to that moment, only one possible interpretation is provided by Dr Scott:

(2) *You may be surprised* to learn that some dinosaurs […].

(3) *It's possible that* Velociraptor and other dinosaurs also had colorful feathers that they used for show.

(4) Birds also use their feathers to stay warm and *it's possible that* Velociraptor did the same.

The choice of tentative expressions lies in the aim of any popularizing text, which is "informative rather than argumentative" (Gotti 2003: 304). The use of hedging expressions is thus a way of critically presenting the scientific information that is being popularized. These examples also show an important aspect that is present in the series, namely the intention of the creators to introduce children to scientific research and to the fact that it involves fieldwork, interpretation of data but also conveys the idea that results sometimes are tentative, especially when dealing with prehistoric creatures.

Another element typical of KD is the presence of figurative language, as is the case in the following example:

(5) Having a covering of feathers is a lot like having a warm coat to wear when it's cold outside.

Example (5) provides an analogy that the children can use to compare what they already know to the new information provided by Dr Scott.

The use of figurative language is a feature also present in specialized discourse. However, the frequency of usage of figurative expressions in specialized discourse and in KD is quite different. While in specialized discourse metaphors and similes are used mainly to introduce new concepts and new terminology (catachresis), in KD figurative expressions (metaphors, similes, analogies, etc.) are used as in example (5), i.e. to convey abstract or complex concepts to a young audience with a limited experience of the natural world who can, thus, compare the features of the dinosaurs to what they have already experienced in their own everyday reality (Cameron 2003; Diani 2018). As regards terminology, the live-action segment uses a general vocabulary, typical of KD:

(6) Some dinosaurs, like Velociraptor, actually had feathers even though they couldn't fly.

(7) They use their wings to swim and catch food underwater.

(8) A lot of dinosaurs like Velociraptor did have cool-looking feathers.

(9) Birds also use their feathers to stay warm.

These examples show a great use of general categories of animals and approximations such as "some dinosaurs" (example 6), "a lot of dinosaurs" (example 8), "birds" (example 9). These expressions are frequently found in popularizing texts; they "show that the popularizer is aware of the semantic approximation inherent in the suggested periphrasis, which is perceived as an imperfect rendering of the original term" (Gotti 2003: 303). We also notice a preference for everyday terms and even colloquial expressions (as in example 8, "cool-looking feathers") that use a descriptive style that is close to the language that children hear at home or use themselves with family and friends, thus also increasing the possibility that preschoolers will easily remember what they have learned through the episode.

The linguistic choices that were identified in the script of the live-action segment are certainly influenced by the limited time of the segment itself, considering that complex information and facts about dinosaurs are to be provided in one minute and 30 seconds. In

addition, limitations to the use of more complex explanations or descriptions are certainly due to the young age of the public as well as to the constraints typical of the medium of communication since TV shows must attract and engage the public's attention, as the educational element is secondary to the entertainment component.

## 6. Final remarks and further research

One of the starting questions for the present study was to ascertain the reasons why the animated series *Dinosaur Train*, aimed at a public of preschoolers, is so popular and how it manages to transmit specialist knowledge regarding Paleontology in an effective way, still keeping the show entertaining and engaging. The visual and verbal analyses conducted have revealed that KD for the Paleontology domain is achieved in the series using traditional, well-tested popularizing strategies as well as a real expert endowed with excellent communication skills to convey complex concepts. *Dinosaur Train*'s success can also be due to the use of a composite structure made of several phases, which make the series dynamic and, thus, suitable to young children's limited attention span, while it employs a simple and accessible language. The dinosaurs are quite realistic but not terrifying and the humans-dinosaurs indirect interaction makes the life of dinosaurs in ancient eras easier to understand because they are shown in situations that are similar to those children might experience in real life. In sum, the success of the series is achieved thanks to a careful mixture of entertaining, educational, and comic elements.

The analysis of the live-action segment has revealed that the series itself provides interesting material to further investigate 'KD for children'. In this regard, further research includes the comparison of other live-action segments, for instance if KD strategies differ when the dinosaur is well-known (as in the case of Velociraptors, Triceratops, etcetera) or when it is a less common type, or even if it belongs to a newly discovered species. In addition, the animated parts

are also worth analyzing since they contain examples of KD spread throughout the story, so it would be interesting to see how KD in the animated parts differs, or is similar to, KD in the live-action segment, and if these differences and/or similarities vary according to the character that conveys them.

The live-action segments as well as the animated parts of the episodes will also be further investigated from a pedagogic standpoint, for instance by comparing their structure and multimodal features to methods in formal teaching (e.g., to the Montessori Method) in order to investigate if the specific choices of the authors of the series are determined by an intentional pedagogic aim. In addition, *Dinosaur Train* will be further investigated by comparing it to other similar edutainment shows in order to understand if the series is a peculiar case or if it follows a common pattern in edutainment products for preschoolers, thus ascertaining if it is unique or just one example of a specific multimodal genre.

Finally, it will be interesting to exploit possible applications of the live-action segments to teaching Paleontology to English as a foreign language (EFL) schoolers. In fact, the segment might be used by primary school teachers in EFL countries who use the CLIL methodology to teach their pupils science-related topics using English as a medium of instruction and who might thus use the segments as supplementary material during science lessons.

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