

Disseminating knowledge through TED Talks for children

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ABSTRACT

The present contribution focuses on a corpus of TED Talks given by children and/or taken from different TED playlists designed to share ideas with middle and high school students. To what extent are TED talks for children different from other TED talks? Furthermore, do they share similar strategies with other informative literature for children? A qualitative analysis of the verbal code and visuals in the data has indeed confirmed expectations for strategies of popularization via general kid-oriented recontextualization, and more specifically via exemplification, reformulation and analogy, as well as strategies of multimodal engagement through humour. A quantitative analysis and comparison with a corpus of generic TED talks (i.e., not specifically involving children as either speakers or part of the intended audience) has also helped validate and expand on the findings above. Indeed, a clearer understanding of popularizing practices at work in this successful platform may be of help in fostering the development of much valued multimodal literacy skills in the contemporary digital educational scenario addressing the needs of the younger generations.

Keywords: TED Talks, popularization, informative literature for children, engagement, multimodality.

1. Why TED Talks for children?

This contribution stems from my interest in the multimodal analysis of TED Talks (Masi 2016, 2019, 2020a, 2020b) and in the literature for children, from the perspective of translation (see, e.g., Epstein 2012; Lathey 2016), especially information books (Mallet 2004), which I view as a form of knowledge

dissemination or, more precisely, popularization for a young lay audience (Cappelli – Masi 2019; Masi 2021).

TED¹ videos are a popularizing genre via short and effective talks rich in multimodal input; they allow for either live, synchronous, or asynchronous, web-mediated access. Over time, the genre has become a highly influential digital platform used in diverse educational settings (cf. e.g., Takaesu 2013; Carney 2014; Dummett et al. 2016), and it also comprises playlists by and for ‘kids’ (i.e., younger children in the middle-grade stage and older ones or teenagers). Given the great accessibility and popularity of the talks, it is reasonable to expect extensive use of such materials (and correlated impact on a young audience) either at school or at home, with or without other family members. Hence the need to shed light on some of their distinguishing features. My goal, then, is to explore the multimodal rhetorical practices at work here, which make TED an inspiring popularization tool for a young audience. In other words, I will try to identify (1) whether and the extent to which TED Talks for kids are different from other TED Talks, and (2) whether they share similar strategies with other informative literature for children. In so doing, it will be possible to unravel meaning-making practices we should be aware of to develop our understanding of how knowledge is popularized for the younger generations in an increasingly international and multimodal communicative landscape.

1.1 The framework

The framework for the analysis is the literature on scientific popularization in general, and on informative literature for children and TED Talks in particular, as more specific types of popularizing genres. Scientific popularization involves a basic asymmetry in communication between experts and non-experts, which hinges upon the reformulation and recontextualization of knowledge for a lay audience (see Gotti 1996, 2013; Myers 2003; Calsamiglia – van Dijk 2004). Indeed, popularization strategies are conceived of as forms of explanation which support the integration of old knowledge into a new lay version of specialized information. They cover the following (see Calsamiglia – van Dijk 2004): denomination (for the introduction of specific concepts), definition/description (to explain unknown terms and ideas), reformulation or paraphrase (through the use of parentheses, dashes, metalinguistic expressions, etc.), generalization

¹ <https://www.ted.com/>.

(based on conclusions derived from specific cases), exemplification (based on specific examples), and analogies or associations (e.g., via similes and metaphors which establish links between different conceptual domains).

As for informative literature for children, this comprises information books and other non-fiction such as extra-curricular materials (Mallet 2004); these involve an even bigger asymmetry, in so far as kids are a non-expert lay audience with a low degree of experience, cognitive skills and literacy compared to adults (Cappelli – Masi 2019). This type of literature tends to mix facts with fiction and is often grounded in edutainment, as it frequently purports to educate through an interactive style, an informal register and wordplay (especially in English). Furthermore, such materials are multimodally rich, including pictures and illustrated books, and reflect the young audience's need for new information to be securely 'anchored' to kids' backgrounds in order to enhance their sense of familiarity, identification, involvement and correlated accessibility of the information.

Several relevant studies on popularization for children exist; they have focused on different subgenres and disciplines, and have adopted different perspectives and approaches (see Diani 2015; Sezzi 2017; Bruti – Manca 2019; Cappelli – Masi 2019; Diani – Sezzi 2019; Cacchiani 2020; Diani 2020; Diani – Sezzi 2020; Masi 2021). These are summarized in the following paragraphs.

Diani (2015), for example, has explored online newspaper articles for the dissemination of legal concepts by adopting a cross-linguistic (English-Italian) perspective. Although English and Italian journalists appear to use similar strategies to popularize legal knowledge for children – with a prominent use of definitions and explanations, markers of dialogic interaction, metaphors and similes – they also display different preferences. The English data show the important role of definitions, while the Italian sample points to a preference for both definitions and paraphrases, often complemented through the use of metaphors and similes.

Sezzi (2017), instead, has focused on English information books on History and on their translations into Italian. Such books oscillate between education and entertainment, like most children's literature, and include direct forms of address to the recipient, the use of different kinds of images and media, informal language and irony. The Italian translations, in particular, tend to privilege accuracy and 'complexification' rather than simplification.

Cappelli and Masi (2019) have investigated travel guidebooks for adults and for children from contrastive and translational (English-Italian) perspectives. The study has highlighted the acknowledgment of different

accessibility requirements on the basis of the age group of the target audience and lingua-culture backgrounds. The English texts tend to be more humorous and interactive, while Italian ones tend to be more formal and less direct, also displaying a variety of translation strategies.

Diani and Sezzi (2019) have studied the discursive resources used in official websites popularizing the concept of the EU. The most frequent strategies that have emerged from their account are denomination, definition, exemplification, similes and a trend towards simplification.

Bruti and Manca (2019) have focused on the popularization of environmental issues in children's magazines as opposed to comparable adults' magazines and also from a cross-linguistic (English-Italian) perspective. Popularizing strategies in the sample of children's magazines appear to involve, entertain and educate the target reader, while language and visuals (pictures and graphic devices) support each other in the explanation of facts and concepts. Also, the data from English magazines for children tend to involve the reader with a more interactive, peer-to-peer style and the use of colloquial language, whereas the Italian sample analyzed is more similar to the adults' version.

Diani (2020) has studied verbal and visual features in websites aimed at the popularization of health knowledge. In these websites, the visual mode appears to have an explicative as well as an appealing function. In more detail, the verbal mode exploits the visual mode to render information more accessible to a young audience and to contribute to their understanding. Images appear to complete information with realistic details.

Diani and Sezzi (2020) have explored scientific websites for children, shedding light on the verbal-visual interplay. Indeed, in these texts explanations of scientific phenomena are frequently intertwined with different kinds of visual material.

Cacchiani (2020) has investigated children's dictionaries, in which first and second person pronouns, adjectives, imperatives and questions in examples work hand in hand with visuals as stimuli for curiosity and interest. Other typical features are, for instance, the inclusion of user-oriented content and an informal style in definitions.

Masi (2021) has analyzed a sample of parallel picture books on Geography in English and Italian addressed to target audiences of different ages from a multimodal perspective. Word-image relations are explored across age groups (i.e., from the point of view of intralingual mediation) and lingua-cultures (interlingual mediation). The intralingual investigation highlights that the books addressed to older children, for example, display

a more prominent role played by the verbal component and wordplay, the presence of framed images, and naturalistic and eclectic styles. The interlingual investigation confirms some of the findings in Cappelli and Masi (2019), as the Italian target texts analyzed tend to be less direct, less involving, more specific in terminology, more formal and accurate than the original texts in English. From a multimodal perspective, the reduced verbal interactivity in the translated texts brings about an alteration of the original word-image relations, i.e., the translated verbal resources establish new multimodal configurations in the target context.

Several of the features mentioned above can indeed be aligned with some typical traits of TED Talks, a popularizing genre which typically addresses both a co-present audience, and web users through the relevant website. The TED talk has in fact been defined as a hybrid genre (Caliendo 2012), sharing features with other categories. The talks are limited in duration, similar to conference presentations, but unlike the latter, they address both specialists and non-specialists, with an informal register that encourages participation and proximity (Scotto di Carlo 2014). Second person pronouns and questions are often used to engage the audience, together with epistemic lexical verbs used to express stance (Caliendo – Compagnone 2014; Compagnone 2014). Judgements and personal positions are expressed through the use of axiological adjectives (Scotto di Carlo 2015), especially promoting aesthetic appreciation and emotive reactions. Similes have also been found to be a frequent explanatory strategy used in the talks (Scotto di Carlo 2012). Furthermore, humour (Scotto di Carlo 2013; Mattiello 2017) is a pervasive feature, in contrast with other more traditional forms of popularization. Reduced technicality in content and vocabulary and the use of narration and personal anecdotes are other hallmarks of the talks (Mattiello 2017), which are also multimodally rich (typically in visuals such as slides with images, photographs, graphs and short video clips, see Theunissen 2014; Meza – Trofin 2015; Masi 2020a). Among the multimodal resources extensively used by TED speakers, or TEDsters, are gestures, which tend to perform different functions and often reinforce the understanding of abstract ideas and promote engagement with the audience (Masi 2016, 2019, 2020a, 2020b). In some instances, several repeated word-gesture patterns also appear to have the potential to enhance cohesion and even to subtly emphasize emotional and value-laden meanings, thus pushing forward the highly persuasive discourse of this genre of talks (Masi 2020b).

On the basis of shared features such as presence of humour, similes (as a form of analogy), multimodal input, and the need to promote participation/

proximity/engagement, I embarked on the analysis of a selection of TED Talks for kids with expectations for various kinds of shared popularization strategies, a high degree of engagement markers and of kid-oriented recontextualization. By 'engagement markers' I refer to devices that explicitly address the audience, either to attract their attention or include them as discourse participants (Hyland 2005: 53), but the notion is here broadened to cover all those communicative strategies especially aimed at involving the audience in a written-to-be-spoken scenario so as to elicit their affective-emotional reactions in different ways. By 'kid-oriented recontextualization' I refer to popularizing strategies that anchor new information to a young audience's background, thus emphasizing the role of young people as the actual protagonists of the talks, which in turn promotes identification and involvement.

1.2 Corpus and methodology

I considered four playlists compiled by the TED Team of editors. The talks involved pre-teens and teens as speakers and/or as intended audience. Here are the playlists:

- *Talks to watch with kids*, described on the platform as 'Fun, informative and captivating talks to inspire young minds';²
- *Kids, teens and their great big ideas*, described as 'Amazing inventions, activism and tons of genius delivered by an awesome group of kids and teens';³
- *Talks by brilliant kids and teens*, 'Talks from scientists, musicians, innovators, activists – all under the age of 20. Watch these amazing wunderkinds';⁴
- *Talks to watch with the entire family*, 'No matter the generation, these talks are perfect for bringing everyone together to learn, wonder and laugh.'⁵

Sometimes, the same talk was included in more than one playlist. Overall, the playlists under analysis contained 36 talks (each talk was counted only once). The majority revolved around Science and Technology (44%),

² https://www.ted.com/playlists/86/talks_to_watch_with_kids.

³ https://www.ted.com/playlists/528/kids_teens_and_their_great_big_ideas.

⁴ https://www.ted.com/playlists/129/ted_under_20.

⁵ https://www.ted.com/playlists/314/talks_to_watch_with_the_entire.

followed by Entertainment and Performance (31%) and Other, i.e., a more varied set of topics (25%), as shown in Figure 1.

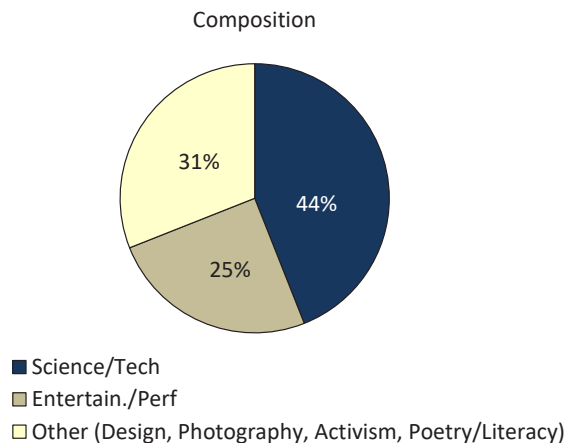


Figure 1. Kid playlists composition

I then decided to focus on 16 talks on Science and Technology from the kid playlists, delivered in English by speakers of different nationalities, and compared them with 16 other talks on Science and Technology not specifically involving children. The two sub-corpora, i.e., the Kid TED Talks Corpus – henceforth KTTC, and the Generic TED Talks Corpus – GTTC, respectively, were similar for time of release, duration, and number of words of transcripts, but were often delivered by speakers of a different age, as illustrated in Table 1.

Table 1. Description of sub-corpora

Sub-corpus	KTTC	GTTC
Number of talks	16	16
Year of release	2007-2016	2008-2019
Duration	Total: 122.29 min	Total: 122.92 min
Total words from transcripts	Around 19,000	Around 18,900
Speakers identity	5 adult speakers, 11 kids/teens (usually inventors)	All adult speakers

Table 2 lists the talks on Science and Technology covered by the two sub-corpora.

Table 2. Lists of TED talks in the two sub-corpora

KTTC		GTTC	
Speaker(s)	Title of the talk	Speaker(s) (all adults)	Title of the talk
Lauren Hodge (kid)	<i>Award-winning teenage science in action</i>	Poppy Crum	<i>Technology that knows what you're feeling</i>
Shree Bose (kid)	<i>Award-winning teenage science in action</i>	Hugh Herr	<i>The new bionics that let us run, climb and dance</i>
Naomi Shah (kid)	<i>Award-winning teenage science in action</i>	James Lyne	<i>Everyday cybercrime – and what you can do about it</i>
Richard Turer (kid)	<i>My invention that made peace with lions</i>	Renny Gleeson	<i>404, the story of a page not found</i>
Thomas Suarez (kid)	<i>A 12-year-old app developer</i>	Will Marshall	<i>Tiny satellites show us the Earth as it changes in near-real-time</i>
Taylor Wilson (kid)	<i>My radical plan for small nuclear fission reactors</i>	Rebecca Brachman	<i>A new class of drug that could prevent depression and PTSD</i>
Jack Andraka (kid)	<i>A promising test for pancreatic cancer... from a teenager</i>	Sara-Jane Dunn	<i>The next software revolution: programming biological cells</i>
Beau Lotto (adult) and Amy O'Toole (kid)	<i>Science if for everyone, kids included</i>	Romain Lacombe	<i>A personal air-quality tracker that lets you know what you're breathing</i>
William Kamkwamba (kid)	<i>How I harnessed the wind</i>	Dean Ornish	<i>Your genes are not your fate</i>
Raymond Wang (kid)	<i>How germs travel on planes – and how we can stop them</i>	Sarah Parcak	<i>Archaeology from space</i>
Ashton Cofer (kid)	<i>A plan to recycle the unrecyclable</i>	Andrew Pelling	<i>This scientist makes ears out of apples</i>
Kenneth Shinozuka (kid)	<i>My simple invention, designed to keep my grandfather safe</i>	Nina Tandon	<i>Caring for engineered tissue</i>

AnnMarie Thomas (adult)	<i>Hands-on science with squishy circuits</i>	Britt Wray	<i>How climate change affects your mental health</i>
David Gallo (adult)	<i>Underwater astonishments</i>	Brian Cox	<i>What went wrong at the LHC</i>
Raffaello D'Andrea (adult)	<i>The astounding athletic power of quadcopters</i>	Lee Cronin	<i>Print your own medicine</i>
Sophie Scott (adult)	<i>Why we laugh</i>	Kaitlin Sadtler	<i>How we could teach our bodies to heal faster</i>

The analysis of the talks was carried out manually and entailed several viewings of the recorded videos and readings of the respective transcripts. In the remainder of the article, I will present and discuss some quantitative data and examples from the qualitative analysis of:

1. a range of tangible markers of engagement, i.e., humour as signalled by laughter; direct questions to the audience as signalled by question marks; interactions with the audience as signalled by applause or other perceivable reaction (such as laughter or hand raising);
2. verbal strategies of recontextualization via specific anchoring to kids' background, especially via analogies (on the role of analogic strategies in children's books, see Sezzi 2017; Cappelli – Masi 2019, among others);
3. visuals, esp. slides.

2. Quantitative data and examples

2.1 Engagement markers

As for markers of engagement, in the KTTC they were more than double the number found in the GTTC. In more detail (Figure 2), the KTTC comprised 82 instances of humour signalled by laughter (H/L) of the audience (vs. 27 in the GTTC), 125 questions (Q) addressed to the audience (vs. 58 in the GTTC) and 49 instances of interaction (Int) signalled by the audience's reaction through applause or other reaction (vs. 14 in the GTTC).

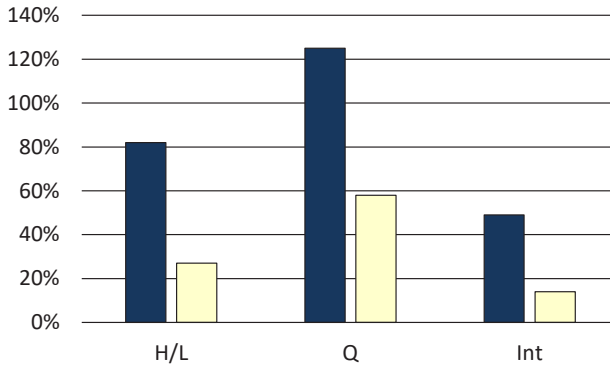


Figure 2. Quantitative comparison of engagement markers across sub-corpora (higher scores relate to the KTTC)

By way of illustration, below are three examples of H/L, Q and Q plus Int from the KTTC.

- (1) Now you might wonder how a 13 year-old girl could come up with this idea. And I was led to it through a series of events. I first learned about it through a lawsuit I read about in my doctor's office (Laughter) (Hodge, 01:06)

Humour in (1) is caused by the incongruity between the expected scenario (i.e., some special place generating an award-winning idea) and the actual unpredictable reported event (namely, a rather banal or absurd location which is part of one's routine).

- (2) What's the fastest growing threat to Americans' health? Cancer? Heart attacks? Diabetes? The answer is actually none of these; it's Alzheimer's disease (Shinozuka, 00:12)

In (2) several rhetorical questions were asked by the speaker to stimulate the audience's participation before introducing the main topic of the talk.

- (3) Can I get a show of hands – how many of you in this room have been on a plane in this past year? (Wang, 00:13)

In (3) the speaker asked for an explicit reaction from the audience, many of whom promptly raised their hands.

2.2 Kid-oriented recontextualization

Kid-oriented recontextualization was found in 15 out of the 16 talks in the KTTC, whereas it was found in only 3 out of the 16 talks of the GTTC. This

specific type of recontextualization often occurred via personal narratives evoking familiar scenarios and activities as a general background to the talk (see the elements highlighted in bold in examples 4-6).

- (4) It was just an ordinary Saturday. **My dad** was outside mowing the lawn, **my mom** was upstairs folding laundry, **my sister** was in her room **doing her homework** and **I** was in the basement **playing video games** (Cofer, 00:12, KTTC)
- (5) But then one night, **my mom** was cooking grilled chicken for dinner, and **I** noticed that the edges of the chicken, which had been marinated in lemon juice, turned white. And later in **biology class**, **I learned** that it's due to a process called denaturing (Hodge, 01:34, KTTC)
- (6) When **I was 13**, a **close family friend** who was **like an uncle to me** passed away from pancreatic cancer. When the disease hit so close to home, I knew I needed to learn more (Andraka, 00:12, KTTC)

Kid-oriented recontextualization also took the shape of examples of activities that are part of children's routine, as illustrated by example 7.

- (7) A lot of kids these days like to play games, but now they want to make them, and it's difficult, because not many kids know where to go to find out how to make a program. I mean, **for soccer, you could go to a soccer team. For violin, you could get lessons for a violin.** But what if you want to make an app? (Suarez, 00:43, KTTC)

In other cases, kid-oriented recontextualization took place as reformulations drawing on personal memories (see example 8) or exploiting metaphors for two common digital tools of contemporary teenagers (see example 9).

- (8) But I want to jump up to shallow water now and look at some creatures that are positively amazing. Cephalopods – head-foots. **As a kid I knew them as calamari, mostly** (Gallo, 01:49, KTTC)
- (9) That's next to impossible. However, undeterred due to my teenage optimism – (Laughter) (Applause) I went online **to a teenager's two best friends, Google and Wikipedia.** I got everything for my homework from those two sources (Andraka, 02:10, KTTC)

2.3 Analogies

Although the number of verbal analogies was higher in the GTTC (49) than in the KTTC (35), the majority of the latter (i.e., 63% of them) recruited

comparata that were more typically associated with familiar objects for children than the majority of *comparata* in the analogies from the GTTC. The analogies from the KTTC, then, often appear to have an illustrative function based on correspondences between different conceptual domains, one of which is more readily accessible to children. This especially shows the TED speakers' will to facilitate children's comprehension of scientific topics (even more than in talks addressing adults). The examples that follow (10-14) are different cases in point, where *comparata* (in bold) range from playdough and metaphoric superheroes to processes and natural objects, and altogether display different sub-functions, i.e., descriptive or illustrative (all of them), reformulating, see (11), and humorous, see (12).

- (10) So if I take this salt dough, again, it's **like the play-dough you probably made as kids**, and I plug it in (Thomas, 01:35, KTTC)
- (11) [carbon nanotubes] They're **kind of like the superheroes** of material science (Andraka, KTTC)
- (12) For me, it's all about looking at the Internet in an entirely new way, to realize that there's so much more to it **than just posting duck-face pictures of yourself online**. (Laughter) (Andraka, KTTC)
- (13) Making a cancer sensor out of paper is about **as simple as making chocolate chip cookies**, which I love (Andraka, KTTC)
- (14) This quad has a racket strapped onto its head with a sweet spot **roughly the size of an apple**, so not too large (D'Andrea, KTTC)

Despite the predominance of analogies recruiting children's everyday objects in the KTTC, more technical *comparata* were also found in both sub-corpora, but especially in the GTTC (see example 15 and 16).

- (15) [nuclear fusion]... this is **similar to the reaction of the proton chain that's going on inside the Sun** (Wilson, KTTC)
- (16) And then to make matters worse, living systems largely **bear no resemblance to the engineered systems that you and I program every day** (Dunn, GTTC)

Indeed, both examples (15) and (16) make use of specialized objects that are hardly accessible to children.

2.4 Visuals

The analysis of visuals (slides and videos embedded in slides) was based on the semiotic type classification proposed in Theunissen (2014) and also used in Masi (2020b). The visuals were subdivided into visual only (either videos or slides with iconic components, usually photos), scriptural-visual (slides containing photos and verbal code too), scriptural-(visual)-graphic (more hybrid slides with photos, words, diagrams or more technical graphic material and, sometimes, even photos), and only scriptural slides (containing only verbal messages). Examples of each type are offered in Figures 3-6.⁶



Figure 3. Visual type 1 – Example of only visual semiotic type



Figure 4. Visual type 2 – Example of scriptural-visual semiotic type

⁶ Using TED screenshots for research is permitted by CC BY – NC – ND 4.0 International. I would like to thank the TED Media Requests Team for their support.

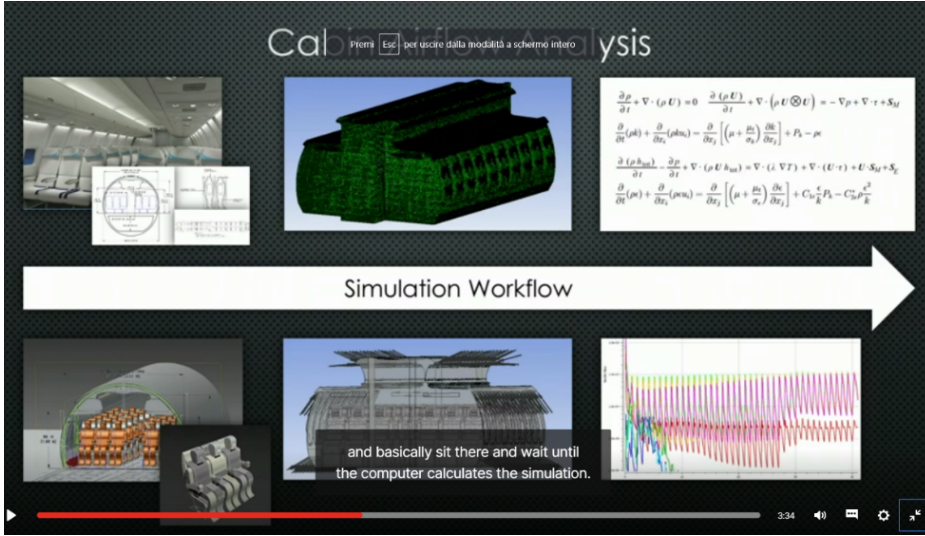
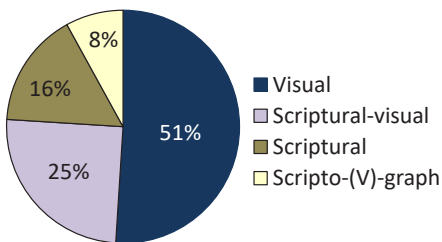


Figure 5. Visual type 3 – Example of scriptural-visual-graphic semiotic type

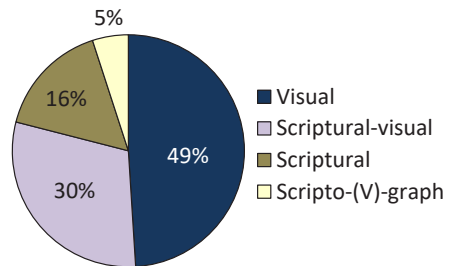


Figure 6. Visual type 4 – Example of only scriptural semiotic type

Visuals in the KTTC: Semiotic Types



Visuals in the GTTC: Semiotic Types



Figures 7. and 8. Semiotic type distribution of visuals in the two sub-corpora

As for semiotic type distribution in the two sub-corpora, the KTTC contained 192 visuals, 1 every 38 seconds, whereas the GTTC contained as many as 229, 1 every 32 seconds. Semiotic type distribution was quite similar in the two sub-corpora (Figures 7 and 8), where the most represented categories were the only visual type (around 50% in each sub-corpus), followed by the scriptural-visual type (25% in the KTTC and 30% in the GTTC, respectively), the scriptural type (around 16% in each case) and the scriptural-(visual)-graphic (under 10% in both sub-corpora):

On the one hand, a significant aspect in the data from the KTTC is that 31% of the visuals (across different semiotic types) involved kids as research protagonists, with their families, at home, with friends, etc., while no similar examples were found in the GTTC. A couple of instances are reported in Figures 9 and 10, by way of illustration.

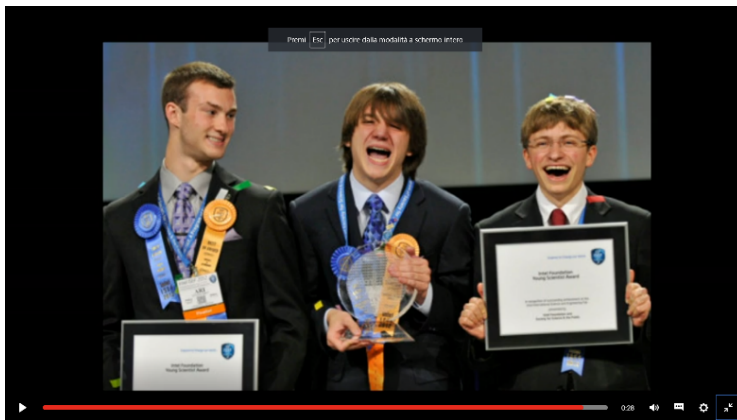


Figure 9. Visual featuring kids (1)

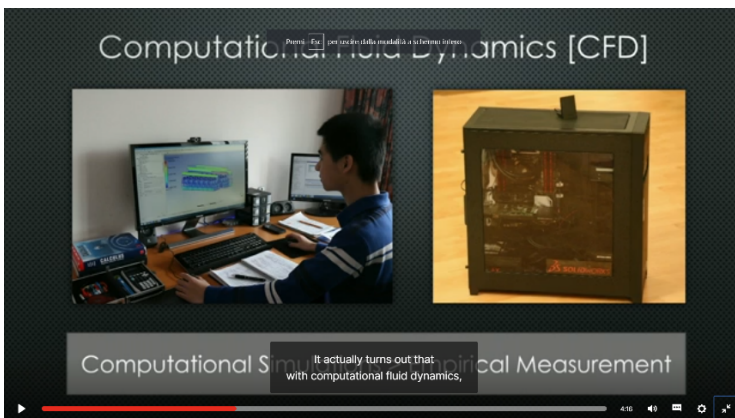


Figure 10. Visual featuring kids (2)

On the other hand, 15% of visual only and of scriptural-visual slides in the GTTC contained specialized visuals with descriptive functions (vs. 5% in the KTTC), as exemplified by Figures 11 and 12.



Figure 11. Specialized visual (1)



Figure 12. Specialized visual (2)

In one case (Figure 13) it was also possible to find a scriptural-visual type, still in the KTTC, of a slide which contained a video (with a frog jumping to catch flies displayed on a smartphone screen) establishing a visual analogy with what was being explained.

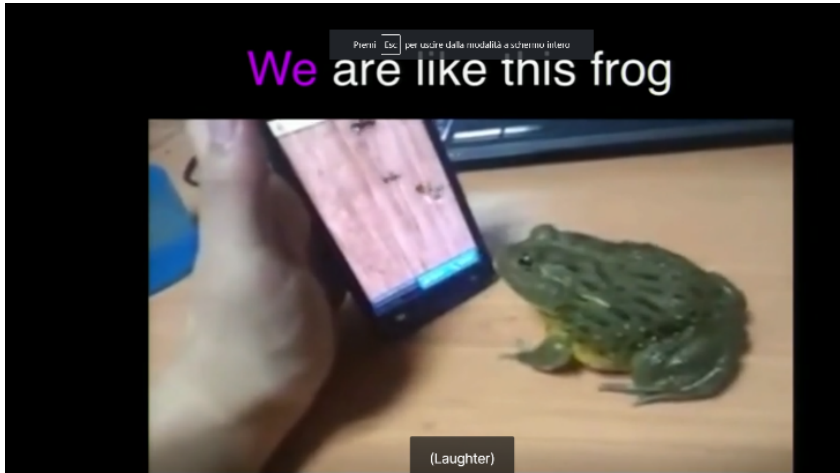


Figure 13. Slide contributing to analogy

Another important function performed by visuals in the KTTC was that of supporting humour, as in excerpts 17-20 respectively, containing the visuals in Figures 14-17.

- (17) And as I came upstairs to get something to drink, I looked out the window and realized that there was something that I was supposed to be doing, **and this is what I saw.**

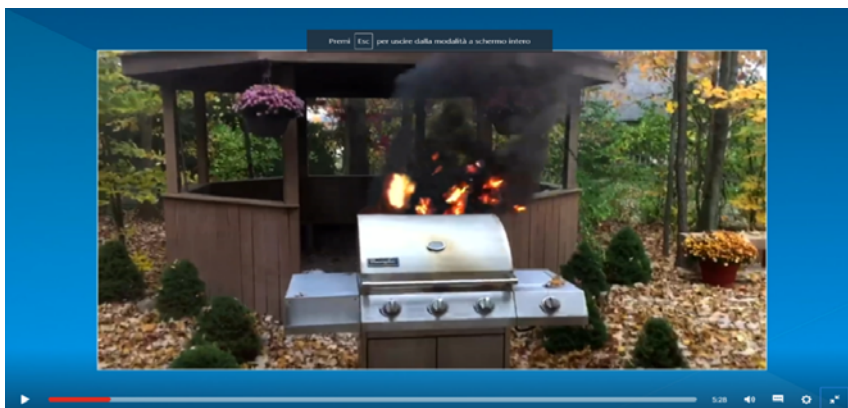


Figure 14. Visual supporting humour (1)

No, this wasn't my family's dinner on fire. This was my science project (Laughter). Flames were pouring out, smoke was in the air and it looked like our wooden deck was about to catch fire. **I immediately started yelling.**

My mom was freaking out, my dad ran around to put out the fire and of course my sister started recording a Snapchat video. (Laughter) [...] So in the future, don't be afraid if your grill goes up in flames, because you never know when **your idea might just catch fire.**

In (17) the personal narrative of the young speaker is complemented by the image on the slide. Humour here seems to arise from the contrast between the somewhat surprising identification of a domestic incident with the speaker's science project. This is further enhanced by the description of the reactions of the various members of the speaker's family, especially his sister's unexpected unhelpful behaviour, climaxing with wordplay at the end of the passage (based on the literal and figurative meanings of 'catch fire' in this context).

(18) My first app was a unique fortune teller called "Earth Fortune" that would display different colors of Earth depending on what your fortune was. My favorite and most successful app is "**Bustin Jieber,**" which is – (Laughter) **which is a Justin Bieber whack-a-mole.** (Laughter) I created it because a lot of people at school disliked Justin Bieber a little bit, so I decided to make the app.



Figure 15. Visual supporting humour (2)

In (18) the image to the right of the slide complements the speaker's verbal explanation, which contains a spoonerism.

- (19) Why are we so bad at detecting pancreatic cancer? The reason? Today's current "modern" medicine is a 60-year-old technique. **That's older than my dad.** (Laughter) (Andraka)



Figure 16. Visual supporting humour (3)

The visual in Figure 16 calls to mind old games (such as battleship), or the abacus, which was used by older generations at school, thus contributing to the humorous effect. In (19) the photo appears to support the idea of the obsolete or inadequate quality of laboratory tools, which is emphasized by the somewhat irreverent verbal comparison with the age of the speaker's father, expressing a sort of subversive attitude towards adults and institutions and aiming at underlining their shortcomings, which is often at play in the popularization addressed to children.

- (20) Now, my breakthrough came in a very unlikely place, possibly the most unlikely place for innovation – **my high school biology class, the absolute stifler of innovation.** (Laughter) (Applause) (Andraka)

The photo in (20) conveys the unexciting image of an empty biology lab, which adds to the subversive approach mentioned above, verbally depicted through the metaphor of an agent repressing innovation.

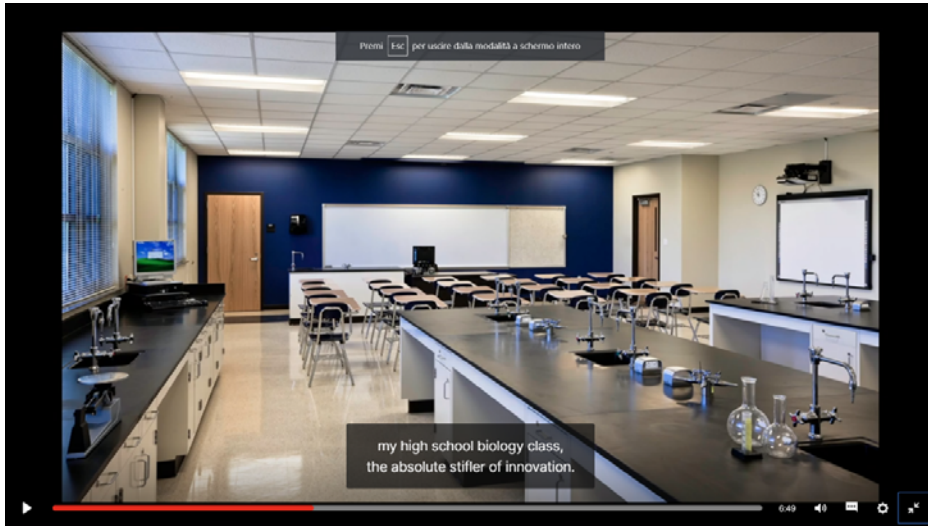


Figure 17. Visual supporting humour (4)

3. Concluding remarks

Overall, the TED Talks for children under analysis appeared to differ from other TED Talks not specifically involving kids (as either speakers or part of the intended audience). As a matter of fact, the expectations specified in Section 1.1 were largely confirmed by the quantitative and qualitative analyses of data.

On the one side, the talks in the KTTC had a hybrid composition, as some of them were more technical than others (e.g., *D'Andrea's* and *Wilson's* talks). In particular, they resulted in being more engaging than the talks in the GTTC, with a strong type of anchoring to pre-teens and teens' world of experience, similar to what happens in much informative literature for children, in which kids, acting as ratified actors (both verbally and visually), are expert protagonists of their narratives able to inspire emulation and love for Science and Technology in a young audience. To be more precise, the analysis of the verbal code in the data has indeed confirmed the presence of strategies of popularization via general kid-oriented recontextualization, and more specifically, via exemplification, reformulation and a range of analogies. Furthermore, some of the talks highlighted a complementary role of visuals, which contributes, once again, to kid-oriented recontextualization and humour.

On the other side, the talks in the GTTC contained more technical information (for instance in the *comparata* of some analogies) and specialized visuals, thus potentially being more difficult for a young audience.

Further steps in the research require more data from other kid-related playlists and TED events, e.g., covering TED-Ed's "lessons worth sharing"⁷ used by students and educators, who can create their own talks in class or in clubs following the TED style. It would also be interesting to explore in more depth the internal distinctions, based on the age criterion, within the TED Talks for the young as a genre. Further insights beyond a bimodal (verbal and visual) perspective are also needed (e.g., the contribution of gestures could/should be taken into account, see Masi 2016, 2019, 2020a, 2020b).

Both the present investigation and the expansions suggested above may contribute to a greater awareness of multimodal practices at work in digital materials based on the successful TED format. This greater awareness and such digital materials can certainly be of use in education addressed to young people, thus ultimately fostering the development of multimodal digital literacy from a young age.

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⁷ <https://ed.ted.com/>.

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