

Television Programs for Teenagers and the Use of Multimodality in Knowledge Popularization*

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The aim of this work is to study the interaction of spoken words and images that are used within programs targeted to popularize knowledge among teenagers. We will look into the program *Bit@bit* developed by Televisió de Catalunya, which is intended to disseminate computer concepts, tools and procedures. In this kind of program, one can find spoken language (on/off screen voices, interviews, etc.), other oral material (sounds, music, songs), written language (descriptions, title sequences, inserts and Uniform Resource Locator, or electronic addresses), and other visual material (film cut images, advertising, other TV programs, cartoons, films, both location or studio images, depicting reality, or computer screens, or logotypes). The profusion of multimodal elements used in this program helps to keep the young audience's attention. The use of references to their world or knowledge, as a target group, is based on interplay among different semiotic strategies. At the same time, the entire program's multi-segmentation into short video clips, combined with a fast paced sound track helps its audience to understand the specialized explanations presented. Of all the multimodal wealth that the program presents, we will concentrate only on the relationship between the words and the images (leaving other secondary semiotics to one side), the main strategy for achieving the objective of transmitting knowledge and winning adolescent audiences.

Keywords: discourse television, knowledge popularization, multimodality, teenagers

Introduction

Capturing teenage and youth audience is a big challenge for television. The youth market is fickle, preferring other audiovisual media and often has a complex relationship with "knowledge" since young people select the subject areas because they want to learn things and have new experiences: "They are television consumers that are especially sensitive to the content presented by television as a medium, not only as a result of their need for knowledge and new experiences but also for their ability to understand and interpret what they consume" (Luzón et al., 2008, p. 2). In addition, since understanding knowledge-related content requires effort, audiovisual productions aiming to get scientific and technological concepts across to this age group have to use innovative strategies and formats capable of attracting optimum attention and empathy.

The present study focuses on the Catalan TV program *Bit@bit*. It is an exuberant case of multimodality,

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repeated intertextuality and attractive hybridisation which work together to construct new knowledge from a starting point of iconic knowledge shared by the target group. The spectator is treated as a pro receiver, as described by Verón¹; in other words, as someone who is also inside the broadcast, who penetrates the inhabitable space of the television. The format is designed for their inclusion in the discursive flow.

Our objective is to determine the nature of the film units and the network used, their characteristics, their relationship with the oral verbal strata and their discursive function within the “style”, in the words of Soulages (2007), of the program. We believe that one of the attractions of the program is the element of surprise caused by the relationship between words and images, and references to cultural areas that are recognized, valued (such as videogames) or rejected (such as traditional festivals—in this case the “castanyada”—which they see as the old-fashioned world of parents and grandparents).

Popularized Knowledge and Television Discourse

Television programs, whose objective is to popularize knowledge, in the broadest sense of the word, from music to computers to gastronomy or economics, treat quite complex and specialized current issues. This means that the information presented can be quite dense and indigestible, so strategies are required to make it more interesting and accessible to the viewer.

These programs seek to demonstrate the social applicability of the information, to help people learn something that may change their lives, make them more comfortable or enhance their understanding. Polyphony is used widely throughout the discourse since the different voices and enunciative states that coexist in the discursive flow are assuming the role of “expert” or of “person affected”, which are established to construct a representation of reality in which received values, and ideologies are sometimes reaffirmed but often deconstructed or modified.

The programs always seek to include real-life experiences of the man or woman in the street, precisely through their contributions in the form of personal testimonials or as ad hoc experts. The relevance of this to the needs and concerns of the viewers also plays a part.

To achieve all these functions, the programs adopt innovative formats. This results from the hybridization of the genre, which is highly segmented to assist assimilation of content and has a significant quantity of dialogue, both as a strategy to signal authority and as a resource to make the content lighter. In the programs aiming at adolescents, humor and emotion are also used to increase the levels of empathy, complicity and attention, and facilitate emotional involvement.

As far as knowledge is concerned, it is important to emphasize the extent to which interdisciplinarity is used to broaden the perspective on the issue under consideration, but also to break up the arguments into the maximum number of segments, small fragments that we call “capsules” (Bassols, 2011), which have a place, time and action unit that rarely exceeds two minutes’ duration. Experts from different fields are invited to talk about the same subject from their particular angle. As Moirand (2006, p. 8) says, “The voice of science appears erased by other voices, and this tends to turn the mediator into the conductor of an orchestra of multiple voices”. But, while the focus is on a certain problematization of the content, any debate is conspicuous by its absence and discussion is avoided as far as possible.

For its part, the dissemination of knowledge (whether it be of a scientific, artistic or leisure nature) uses an

¹ Verón (1989, p.78), in the analysis of political discourse uses the name “pro receiver” for the receiver situated in the same “us” group as the announcer.

amalgam of discursive genres, which may include anything from a presentation to a journalistic article. Their goal is to give accurate specialized information allowing the audience to make new sense of it, and integrate it into their existing knowledge. Audiovisual media specifically do not try to enlighten an ignorant audience; they seek only to influence attitude and opinion. Galán (2003) says:

The meeting point (between science and the general public) seeks to create new knowledge, attitudes and needs, which sit upon a system of pre-established knowledge and beliefs. To do this it uses mass diffusion of a particular kind of social account, which intermingles with other social commentaries and has a direct influence on health management, education, ecology and even on people's leisure activities. (pp. 146-147)

The Program *Bit@bit*

Catalan Television proposed a weekly program for adolescents, *Bit@bit*, whose aim was to communicate concepts and tools associated with new technologies. The idea was to surf the internet, focusing in depth on the world of mobile phones, MP3 and video games. It sought to talk about everything that could possibly be of interest to television, internet or mobile phone users.

They invented a cartoon character of a 17 year old girl, Bitbit, who was into iPods, skating and jokes (just like the potential viewers). She presented different sections of the program with cheeky and funny comments. Right from the start there was also a webpage with its own "chat" and Bitbit had a personal blog.

The tone of the program was to push the boundaries, so as to connect with a young audience.

Theoretical Framework

Fundamentally, we base our theories on studies of image and multimodality (Barthes, 1964; Compe, 2009; Charaudeau, 2005; Kress & Van Leeuwen, 2001; Kress & Van Leeuwen, 2006). These authors are arranged in two lines of antagonistic research, evidently conditioned by the text type² studied, printed or audiovisual: those who consider that in the elaboration of meaning, the verbal message takes priority and the image is subsidiary, such as Barthes; and those who maintain that the words and images carry the same importance in the construction of the meaning of a multimodal text, such as Compe, Charaudeau, Kress and Van Leeuwen.

Our research clearly places us with the second group of researchers, since in the study of an audiovisual text such as *Bit@bit* it can be seen that the meaning is constructed "in multiple articulations", as Kress and Van Leeuwen (2001) say, and only through the conveyance of the two semiotics can overall meaning be reached, and the projected objectives of spreading knowledge and entertaining the spectator are achieved.

As far as the discrimination between the different phenomena of cohesion is concerned, we have based our research on the proposals of functional grammar and text linguistics by Halliday and Hasan (1976) and Halliday (2004³), although these authors only make reference to grammatical and lexical categories in a verbal text. That is why we have adapted these categories to the existing relationship between the words and images. In other words, we have omitted some and added others, so that the links established by the verbal and the visual track in television text can be explained.

If we give a brief summary of the theories of the abovementioned authors, starting with those that are interested in the role of the image, we find that in an article that was a distinct milestone in the study of semiotics, Roland Barthes (1964) postulated that image has three different messages:

² From our linguistic focus, we use "text" and "discourse" as synonyms —utterance (or collection of utterances), written or spoken, that act as a semantic unit and have communicative intention; not as a dichotomy ("text" = abstraction; "discourse" = production). The selection of one term or another is not guided by any conceptual distinction.

(1) The linguistic message. Barthes, in the study of advertising print messages, takes into account the linguistic messages embedded in the image (subtitles and signs, diegetic or non-diegetic), and which can give a connotative or denotative message.

However, in our paper, we will only take account the script the viewer hears —the written words are minimal and have no impact on the discourse— to reach the overall sense we get with the images.

(2) The literal or denotative iconic message, which arises from the combination of elements which make up the image. Although these elements have their roots in reality they are also interpreted from the starting point of the transformation they have undergone through visual codes, such as mobility or photographic composition.

(3) The symbolic iconic message, for which a good general knowledge is required (or intertextual knowledge, as we shall see in some of the examples we have detected in the program under analysis). The symbolism and values attached to the connotation will allow us to observe the underlying ideology.

According to Barthes images in themselves are polysemous, given that they have inherent a floating chain of meanings, and it is only through the linguistic message, which constantly guides the interpretation of these images that the subject can identify which meaning to choose. It is precisely the disparity of possible readings of the same image that can threaten the very code that is used to read the images.

Among the authors who argue there is a semiotic unit of audiovisual discourse is Van Leeuwen. In one of his earliest approaches (1991, p. 76), he considers that that text is an indivisible unity and, therefore, should be analyzed taking into account the fusion of two integral parts, the visual and the verbal. As regards the errors which may be made if linguistic structures were projected onto the analysis of the visual domain, Van Leeuwen believes that every semiotic, in its own way, can perceive the kinds of logical relationship which the different cultural domains allow, in order to be able to act, suggest, etc.. In that sense, he defends the idea that although some conjunctive relationships, in a given social or historical context, may only be perceived visually, others only verbally and yet others in both semiotics, there is always only one “content form” although it may manifest itself in different “expression forms”.

Later on, this author, together with Kress (2001, p. 26), would tackle the idea of multimodality as a means of communication which incorporates various semiotic modes into the design of a product or an event, narrowing the field of interest to “how people use a range of semiotic modes to construct meaning in specific social contexts”. It is significant to notice how these different modes are combined: whether one empowers the other, or whether they play complementary roles. On the other hand, they define communication as a process in which a semiotic product or event is articulated and produced and interpreted or used.

Moreover, they point out how interesting it would be to find principles of multimodality, such as “framing” (“continuity” versus “discontinuity”), valid for visual, written and spoken works, even where they materialize differently in each semiotic mode. They consider that the multimodal texts construct meaning in multiple articulations (as opposed to the double articulation of traditional linguistics) and they talk about four domains of action (“strata”) which contain meaning: discourse, design, production and distribution. According to this: (a) *Discourse* is a socially constructed interpretation of reality (a course of events which constructs reality then evaluates, interprets and legitimizes it); (b) The *designs* are the conceptualizations of semiotic products and events, enabling the discourse to function in a communicative context. They also take into account which communicative context may change the socially-constructed knowledge in a given social interaction (e.g., tackling the racism issue in a soap opera); (c) *Production* refers to the organization of expression and

includes a set of technical skills, related to the instruments and material means of executing them; (d) *Distribution* does not add meaning, but facilitates the pragmatic function of the preservation and transmission of the program.

The research carried out in France in this field includes the work of Charaudeau and Compte. According to Charaudeau (2005, p. 188), media images have three functions: designation, figuration and visualization. *Designation* consists of directly presenting the world in its perceptual reality; it is a way of being present in that world, which is transformed into a visible autonomous object. Designation seeks to convey the sensation of “authenticity”. *Figuration*, on the other hand, is a reconstruction of a pre-existing world, not now immediately perceptible but may be represented through simulation. It is an analogy, not a copy of reality, but a construction-representation of something imaginary. Figuration seeks to convey the sensation of “credibility”. Lastly, *visualization* is representation through a system of codes, a way of organizing the world that is not immediately perceptible, through graphics, outlines, drawings, and so on. Visualization seeks to recreate the effect of “unveiling the truth”.

Compte (2009, p. 274) considers that the image has not a role of simple illustration. It accompanies and recontextualizes meaning, and sometimes becomes an assurance of truth or authenticity. It provides true understanding and mediates towards the acquisition of new knowledge. According to Compte, there are three types of relationship between the audio and video channels: redundancy, complementarity, and opposition. She refers to *redundancy* when the same information is presented on audio and video channels: it is used in pedagogical documents, but it is poorly tolerated in a public issue. *Complementarity*, when the image and the audio provide information that complements each other by keeping a slight delay in their appearance on the screen, this instance is the most widely used in TV. *Opposition* is used to arouse laughter or surprise and requires more attention on the part of the viewer, because he must find other cues to understand this singular relationship; that is why its use is ad hoc and limited.

The contributions of these linguists proved very useful to us when analyzing *Bit@bit*. We were able to take advantage of some of Barthes’ references to connoted meaning; from Van Leeuwen and Kress we took the defense of the single meaning that multimodal texts have, such as the text of our program; from Charaudeau we took the distinction of the three functions of image *designation*, *figuration* and *visualization*, as guarantees of the reality of the discourse; from Compte we took the three large blocks in which images are sorted according to their links with the words—redundancy, complementarity, and opposition—which offer a clear general typology in which new categories can be placed.

As far as Halliday and Hasan (1976) and Halliday (2004) are concerned, their theory of textual cohesion, especially their consideration of reference and lexical cohesion, even though it only refers to the grammatical and lexical categories of a verbal text offered us a highly productive and adaptable initial framework of the special characteristics of the relationship between words and images. We have therefore integrated the phenomenon of *repetition* with the name “total identity”, and we have taken the *part-whole* and *opposition* relationships to as being “partial identity”; however, what he calls *collocation* we have broken down into “setting”, “causality” and “exemplification”, because the images in the program indicate those concepts.

Multimodality as a Strategy for Attracting Adolescents

One of the most obvious characteristics of the program under scrutiny is the frequency with which the shot changes per minute. One possible explanation of this phenomenon, rapidly gaining popularity in youth

programs, could reside in the following affirmation from Pindado (2006):

Modern text required time, and relaxed contemplation; postmodern text, speed and ever-changing emotion and stimulus. A multitude of exciting messages calling for subjectivity (...) Modern text is analytic; postmodern text, synthetic. Modern text is unidirectional; postmodern text turns in all possible directions, capable of dealing with various stimuli simultaneously. It is a plural, varied and immeasurable “self”. (p. 13)

These characteristics would perfectly describe the program *Bit@bit*. Moreover, since the images are charged not only with symbology but also with values, we shall endeavor to analyze the relationship between its oral and visual semiotics, and the cultural references that some or all of them have.

These symbols and values play a determining role in the construction of young people’s identity (Belmonte & Guillamón, 2005), given that “the media act as a mirror for adolescents” (Pindado, 2006, p. 13). This can be explained by the symbolic power of television and by adolescents’ capacity to incorporate the messages received. Identities have both an individual and social expression, and it is in the latter that we can best observe the influence of the media as socialization agents in the process of extracurricular education.

Belmonte and Guillamón (2005) also underline the need for investigation of television text as a “polysemous proposal”, with multiple meanings foreseen by the broadcaster and multiple meanings interpretable by the viewers (for all that the balance between both forces of negotiation of meaning depends on each situation). This is the premise for the analysis we will present.

Analysis of the Relationship Between Oral and Visual Discourse

The relationship between verbal and visual semiotics is the keystone to the success and all the communicative possibilities of television as a means of communication in the domestic sphere. Although internet also takes advantage of this potential, with a following of 45.9%, it is still a long way from the 91% the small screen can boast.

Our study therefore seeks to identify the kind of relationship that is established between oral language and its accompanying images, with respect to the function that these exercise. The result is the following classification laid out with illustrative examples. The classification comes from text linguistics: Charaudeau and Maingueneau (2002), Halliday (2004), and Halliday and Hasan (1976), although it was adapted to the multimodal text by the authors to explain the relationship between the words and the images in *Bit@bit*. That is why only the items that appear in the word/image relationship in the program. Reference (A) is one of the main concepts of text linguistics: one of the mechanisms that guarantees the cohesion of the text; this is “endorphic reference”, because it occurs between two explicit “signifying units” (word/image) in the multimodal text.

In general, it can be observed that words and images have two main types of relationships: *reference* and *fictionalization*³, depending on the characters, objects or processes named in the oral text or, conversely, when only the producer of that text is shown. In the first case the two semiotics have been produced at different times. Almost certainly the script will have been written first, and appropriate images to illustrate it found later. In the second case, image and sound form part of the same moment of production. When a person has been recorded, what he or she says has also been registered; when a cartoon character has been sketched it is in consideration of that it will say.

³ We use the term “fictionalization” in the sense given by Compte (2009, p. 145), i.e., as the “construction of a fiction character”, as proposed by Casetti and Odin (1988).

Table 1

Classification of the Word/Image Relationship

(A) REFERENCE “Relationship established between certain linguistic units and the images that accompany them”
1 <i>CONNOTATION</i> (metaphor) “Meaning associated with words and image that is added to the literal meaning”: “Hello!”- <i>Hello!</i> [jumping elephant, with the connotation of “happiness”] ⁴
2 <i>DENOTATION</i> “objectivable level: basic meaning of the word that the image picks up and specifies in submission to meaning”
2.1 TOTAL IDENTITY of the referent (association by identity): ‘Un virus d’ordinador és un programa informàtic però té semblances amb els virus biològics?’- <i>A computer virus is a computer program but it has some similarities with a biological virus</i> [when they talk about biological virus a microscope image of one appears on the screen]
2.2 parTial IDENTITY OF THE referent (association by analogy):
(a) circumstanTial RELATION:
• EXEMPLIFICATION: ‘per què totes les castanyeres semblen bruixes?’- <i>Why do all the chestnut sellers look like witches?</i> [different images of fictional witches from TV cartoons or animated films]
• CAUSALITY: ‘perquè també es consideren software maligne’- <i>because they are also considered malignant software</i> [Eddie Murphy looks scared] ⁵
• SETTING: ‘es tracta d’altres programes que sovint confonem amb els virus’- <i>this refers to is the several other programs that we often confuse with viruses</i> ” [office with computers]
(b) PART-WHOLE RELATIONSHIP: ‘-És l’hora del Bitcionari. Atenció!’- <i>It’s Bitcionary time</i> ⁶ . <i>Watch out!</i> [images of different words]
(c) OPPOSITION OR CONTRAST: ‘Noies la competició és dura!’- <i>chestnut ladies</i> ⁷ , <i>the competition is hard</i> [various beauty queens parading] (the chestnut ladies have been characterized as witches and contrast with the beauty queens)
3 SUBSTITUTION
The referent of the text is substituted by an image or other referent: ‘els virus, a més d’infectar i propagar-se, han d’evitar ser detectats’- <i>the virus, as well as infecting and spreading must avoid being detected</i> ’ [man hiding to avoid being detected]
(B) FICTIONALIZATION
Characters (cartoons or actors) interrupt the voiceover discourse with comments, jokes, ironic comments, illustrations etc., and unlike it, actually appear on screen while they are talking.
“T’ha fotut?”- <i>It’s gotcha!</i> [Jason Biggs says this sentence after the voiceover has explained that computer viruses reproduce and infect computers]

The most complex combination of functions relates to the reference section, which comes as no surprise, since the image can produce a connotation, a denotation or the substitution of a verbal element. If the relation between the spoken and image referent is weak or the image suggests some concept or value that is easily identifiable by the receiver, we are talking about *connotation*, generally metaphorical or metonymical. For example, when the jumping elephant comes on to tell us how happy the voiceover is to be presenting a new episode of *Bit@bit* and meet up with the audience again. We are talking about *substitution*, on the other hand, if a verbalized action coincides with a visual one and is more or less directly related to it. For example, if viruses which try to hide to avoid detection are mentioned at the same time as we see a man hiding.

⁴ Because there is an associated meaning as well as an explicit meaning between the word “Hello” and the image (elephant) : that of a welcome. the happiness of a meeting. That is what is suggested by the elephant when it leaps into the air (obviously re-cut), that was widely shown through YouTube and Zappinternet, and that adolescent viewers were almost certainly familiar with.

⁵ Worms and Trojans are considered malignant software and malignant things are scary.

⁶ *Bitcionary* is a competition in which the young people have to guess the meaning of new computer words such as *cookie*.

⁷ In Catalonia chestnuts and sweet potatoes are traditionally sold in the street. The traditional chestnut seller (*la castanyera*) is an old lady dressed in a long skirt.

By far the most diverse function is denotation, where the coincidence between verbal and iconic referents can be absolute, for example when a biological virus is shown and talked about at the same time; or, and this is the most common case, it may be partial, when the relationship is not complete. Normally there is a relationship, albeit a fragmented one, between the referents (which may materialize in a purely circumstantial link) of part/whole, of causality or of contrast.

In the relationship of contrast, there is a kind of opposition between the referents of the two semiotics: for example, ugly witches are talked about while beauty queens are seen parading. In the part-whole relationship, on the other hand, the relationship is based on the fact that one referent is a part of the other, as when we talk about *Bitcionary* (a dictionary of computer terms which the viewers can play with) and a series of words are seen.

Finally, in the *circumstantial relationship*, which is by far the most common in these types of program, there are three different functions. Firstly, the image may serve as an example of the verbal referent, in the case of exemplification, for example, when witches are mentioned and a Walt Disney cartoon witch is shown. Secondly, a causality can be established when its referent has a cause and effect relationship with the referent of the oral text, as is the case of the verbal reference to the malignity of software at the same time as Eddie Murphy's frightened face appears on the screen. And thirdly, the image may serve to create the *setting* of the verbal text, when the frame of the *setting* is shown. An example of this is when we see images of a whole office yet talk only about the computers that are in it.

Analysis of the Program "Virus Informàtics"

Table 2

Analysis of "Virus Informàtics"

Image	Oral text	Minute	Function	Cultural reference
1. Elephant jumping (7 tons ² of N. Deveaux)	<i>Hello</i>	00.01	CN	Youtube and Zappinternet
2. "Panellets" (kind of cake)	<i>We are stuffed with panellets</i>	00.02	I	tradition
3. Virus	<i>If your computer is stuffed with viruses,</i>	00.04	I	computer technology
4. Cracked codes	<i>you'll be interested in everything we have to tell you today about these strange computer beings.</i>	00.06	I	computer technology
5. Sweet potatoes	<i>We've had enough of sweet potatoes</i>	00.10	I	tradition
6. Sean McNamara and Christian Troy from <i>Nip/Tuck</i>	<i>But rather than being operated on by someone from Nip Tuck,</i>	00.12	P/W	television series
7. Kim Boix	<i>We decided to pay a visit to Kim Boix, the plastic surgeon shown in the photograph and a real motibit.</i>	00.14	I	Photoshop
8. Chestnuts	<i>We are sick to death of chestnuts. No, no, not those ones, the other ones</i>	00.20	I	tradition
9. Images of the game	<i>The ones that kick the rabbits in Rayman Raving Rabbits 2.</i>	00.25	O	videogame
10. Robin Williams	<i>That's what we're like!</i>	00.29	F	cinema
11. Mr. Bean crying	<i>And we have an existential question:</i>	00.31	S	television series
12. DA witches (from the <i>Les 3 bessones</i> and another witch)	<i>Why do all chestnut sellers look like witches</i>	00.33	E	children's story
13. DA Ronaldinho witch	<i>And have moustaches</i>	00.35	E	football
14. Witch (Demi Moore)	<i>And no teeth?</i>	00.37	E	cinema
15. Miss USA competition	<i>Chestnut sellers. The competition is tough!</i>	00.38	O	beauty contest

(Table 2 continued)

Image	Oral text	Minute	Function	Cultural reference
16. Javier Cámara opening a tent in the film <i>Ficción</i>	<i>Bit@bit is about to begin!</i>	00.42	S	cinema
17. Bitbit with a remote control	<i>Computer viruses!</i>	01.02	F	
18. Huge computer	<i>Have you noticed that your computer sometimes does strange things?</i>	01.06	E	electronics
19. Man dressed as a woman, dancing	<i>No, no, we don't mean it dresses up in a flamenco dress and starts singing, as some do</i>	01.08	E	low quality television
20. Mr. Rogers, Samantha's husband in <i>Bewitched</i>	<i>Yes, that can happen,</i>	01.14	S	television series
21. He turns green and purple	<i>It's very likely you've got a virus. No not you, the computer.</i>	01.16	S	television series
22. Virus magnified	<i>A computer virus is a computer program but it has some similarities with a biological virus</i>	01.18	I	biology
23. Girls blowing their noses.	<i>But obviously its not catching</i>	01.24	O	medicine
24. Girl writing at the computer	<i>Viruses are different from other computer programs and they have two characteristics:</i>	01.27	SE	computer technology
25. Gremlins chasing humans	<i>They can reproduce like Gremlins,</i>	01.32	I	cinema
26. programs, cables, web page	<i>and they can be transmitted to other computers through programs, files and connections to the net from your computer</i>	01.37	P/W	Internet
27. Jason Biggs	<i>It's gotcha!</i>	01.42	F	cinema
28. Office with computers	<i>This makes them different from other programs which we often confuse with viruses:</i>	01.44	SE	computer technology
29. Worm Sasser	<i>Worms</i>	01.47	E	computer technology
30. Brad Pitt en <i>Troy</i>	<i>and Trojans</i>	01.48	S	cinema
31. Computer screen being programmed	<i>All of these programs are a problem</i>	01.50	E	computer technology
32. A scared Eddie Murphy	<i>Because they're also considered to be malignant software</i>	01.52	CS	cinema
33. Worms	<i>Worms spread on their own and they don't need anything to attach to</i>	01.55	S	biology
34. The movie <i>Troy</i> (the horse)	<i>And Trojans, although also malignant software, don't reproduce.</i>	01.59	S	cinema
35. Screen with Bulo:Sulfnbk.exe	<i>Now we've got viruses clear: you must be wondering why they're called viruses.</i>	02.03	E	Internet

Notes. CN: Connotation; I: Total identity; IP: Partial Identity; C: Circumstantial relationship; E: Exemplification; CS: Causality; SE: Setting; P/W: Part-whole relationship; O: Relationship of opposition; S: Substitution; F: Fictionalization.

Description of the Extract

The extract is 2'06" long comprising the list of contents (1'05") and the first sequences of the program (1'01").

There is a voiceover narrator responsible for presenting the program and the subsequent explanation of the characteristics and means of propagation of computer viruses. His discourse is quite unique because, although it is undoubtedly didactic in nature, it is shot through with colloquialisms, humor and amusing diversions that are a far cry from the formal, ordered and precise format that you would expect.

The voiceover narrator is interrupted on two occasions. The first when Bitbit proclaims euphorically the title of the program; and the second by a cheeky adolescent comment.

The images which accompany the narration appear and disappear at breakneck speed and are fragmented and dislocated. In some cases they are images of people, objects and events—largely taken from the media referred to in the oral discourse; but in others the referential identity only partially coincides, and suggested connections play with ambiguity, connections as far apart as cinema, television, Internet, gastronomic tradition, biology, video games, football or cartoons. In other words, with things adolescents can emotionally identify with.

The bringing together of words and images fulfills the program's objective: the words transmit knowledge and the images maintain the interest of a young audience.

Image and Oral Text in “Virus Informàtics”

Our analysis is centered on the images' function in relation to the oral text, by means of the following table. The results are the following:

Table 3

Results of the Images's Functions in Relation to the Oral Text

Categories	Total in the extract	%	Total in the text	%
Connotation	1	2.94	3	2.20
Identity	8	23.52	27	19.70
Exemplification	8	23.52	42	30.70
Setting	2	5.82	6	4.41
Part-whole relationship	2	5.82	8	5.90
Opposition	3	8.82	5	3.80
Substitution	7	20.58	25	18.50
Fictionalization	3	8.82	20	14.70
Total occurrences	34	99.84	136	99.91

As it can be observed, the categories *identity* and *exemplification*, both with a 23.52% of occurrence, are the categories with the highest representation in the extract analyzed. The fact that the sample includes the opening is, certainly, a contributing factor to the emergence of the category *identity*, given that in the presentation of the main themes—computer viruses and Photoshop—the voiceover and the image frequently act in unison (e.g., when they say “these strange technological beings” a coded script appears on the screen). However, in the totality of the program, the *identity* is in the second place, well below of *exemplification*, which is the first category used.

As far as *exemplification* is concerned, where the reference of images to words is partial and often limited to the field of hyponymy, concepts and processes in general are presented while the image shows one or more of the possible cases by way of example. So when worms are mentioned the Sasser computer worm appears on the screen. This is one of the most common processes in explicative discourse in general, and *Bit@bit* is no exception. Moreover, *exemplification* is often part of the entertainment because it gives the opportunity to show funny and attractive associations that are close to the audience's experience (e.g., when they mention witches and well-known cartoon witches appear, when Ronaldinho is dressed up as a witch, or when they draw parallels between a computer and a biological virus and we see a man sneezing). It is because of this capacity to entertain and evoke experiences that *exemplification* is by far the most prevalent strategy in the program.

Substitution is also a favorite strategy, because the referent suggested by the image, as opposed to that of the words, is powerfully emotive and invites us to relive shared cultural universes, as may also be the case with *exemplification*. The image of the Trojan Horse to represent the malignant Trojan software is an example. In

general, *substitution* affects the subject, but not the action, although it often distorts it. Take for example the statement “We have an existential question”. The subject, “we”, is substituted in the image by Mr Bean crying while sitting an exam he cannot do. It is also the case of the opening image when the presenter says “*Bit@bit* is about to begin” and we see a scene from the film *Ficció* in which Javier Cámara zips open a tent.

Through the *setting*, the image makes no allusion to the referent of the words, but to the environment in which the action takes place. It is an indirect approach to the said referent. The suggestion of an appropriate atmosphere is preferred for the representation, rather than an exact demonstration of whom or what the subject is (e.g., the voiceover says, “This makes them different from other programs we often confuse with virus”, and the image shows an office full of computers.

Opposition or *contrast* is the negative of the image, in the sense that it shows something contrary to or contrasting with the content of the words. In this case the surprise factor is a basic ingredient, and once again the ironic, humorous card is played. This is what happens when, for example, after making us believe that we are talking about chestnuts (the nut) they show a box full of chestnuts and say “We are about to burst from so many chestnuts”, only to add “no, not those ones, the other ones” (There is a pun on the word “castanya” which can mean both “a chestnut” and “a wallop” or a “blow”, or in this context “a kick”) and we see a character in a videogame giving a rabbit a good kick, as a result of which it could effectively burst from the blow. On another occasion, after describing the chestnut sellers as witches, they are warned “the competition is stiff” and we are shown a Miss America beauty contest, the contestants’ fixed smiles, the bathing suits and sashes.

In the *part-whole relationship* the image shows one part of the whole being formed by the oral discourse. It is similar to the rhetorical figures of the “synecdoche”. It makes only a discreet appearance in the program. There is one example in the contents: while the narrator says, “But rather than being operated on by someone from *Nip Tuck*”, we see a picture of Sean McNamara and Christian Troy, the main characters of the TV series, and so a part of, *Nip Tuck*.

The *causality* shows us the effect of an action. It is barely present in the program, except when Eddy Murphy is shown looking scared, while the oral discourse affirms “all these programs can give you a fright, because they are also considered to be malignant software”.

The *connotation* is produced when the image acts as a metaphor for, or comparison with, what is being said. The opening scene of the program—the video *7 tonnes 2* of N. Deveaux, which Youtube and Zapperinternet have shown, with huge success in terms of the numbers of visitors to the site, is a prime example. There is an elephant that has just done a spectacular jump on a trampoline. It has a happy, welcoming feel to it. And the word we hear is “Hello”. In other words, everything starts off on a good optimistic footing and, more importantly, the majority of the young audience has seen this video and will be quick to empathize with the program.

Finally, there is a case of *fictionalization* when a character appears on the screen and speaks at the same time. The voiceover hands the stage over to the character. The most interesting example is when Bitbit, the cartoon character belonging to the series, authoritatively presents the program “*Bit@bit*”—and then, symbolically, starts it off with a remote control. Another example is the actor who in saying “T’ha fotut!” (“It’s gotcha!”) is making fun of someone for being victim of a computer virus.

Conclusion

The analysis of the program *Bit@bit* leads us to the following consideration:

The type of receiver significantly conditions the format and structuring of the discourse in this program about new technology, so much so that that one could say that it is not for adult viewing, since adults would not recognize the visual referents because they are not their own, and they would be bothered by the speed with which the images and the ideas appear. Among the audiovisual products that young people consume, alongside films and series have been placed objects produced by newer technologies: (television, mobile phones, computers, internet, etc.). The range of possibilities has grown in at an extraordinary rate in very little time. Moreover, the intertextuality of these supports has been perceived as an opportunity to create a macrotext that is continuous in time and segmented in content where the consumers are obliged to find links and fill in the gaps; processes that seem to be more attractive than dissuasive. What is constructed in the program is found in the world of young people: It refers to it and expands on it.

The fact that today's adolescents have a large range of audiovisual and consumer products available to them, some perhaps more attractive than television, means that capturing audiences is basic in informative-type programs. A key role, then, is that of the link between images and verbal language and some of the operations that have been detected within them. In terms of the functions of the images in relation to the oral discourse, they are mainly to *exemplify*, *identify* or *substitute*: the first two act in relation to the explicative discourse and the last to the discourse of entertainment. It is a case of capturing and making loyal an audience who would probably consider conventional computer classes to be boring.

Bit@bit has a strong teaching component—the sequence is predominantly explicative, and the *identifications* and *exemplifications* work together to help young people to understand subjects that are complex but at the same time close, useful and attractive to them. They do not need to be persuaded of the benefits of computers and new technology because they are privileged and keen users. In that sense the program is at an advantage. Using shared, easily accessible references new information is introduced in small doses, much smaller than in the academic world. As far as the educational role of the media is concerned, the adolescent audience receives knowledge as much, if not more, from the audiovisual world as it does from the conventional academic one. It is familiar with the referents from the world of the media, given that new technology allows for reiterated and repeated consumption of its favorite products. The market for audiovisual products is huge, easily accessible and sometimes completely unrestricted, in terms of both money and time. The relation between verbal language and image activated the knowledge of the receiver, both in the field of computers and audiovisuals, since films, series, objects produced by newer technologies (television, mobile phones, computers, internet, computer games, etc.), appear in flashes that are illustrative, paradoxical, contrasting, humorous, etc., following the flow of the words, with the purpose of making the discourse understood and making it less dense.

The type of cognitive process that the program demands is completely different from the other discourses for the communication of information—even other television discourses—that have longer conceptual units, establish more explicit causal relations, are denser terminologically and are centered more on the analysis than the results of the processes. It could be said that the whole program is designed to be adapted to a type of reasoning that the young people have, based on fragmentation and the simplification and association of ideas, as well as a highly visual, basic component with which they are very familiar.

The youth audience is highly attracted to products packaged with humor and fear. In this case, *Bit@bit* plays significantly on humor, which is a leading element for ensuring audience enjoyment and increasing empathy. The *substitution* relationship between words and images, thanks to a whole stream of audiovisual fragments taken from products consumed by young people, is primordial in that sense. But there are also other

elements that ensure the surprise or laughter impact, such as the breakneck speed of the images (up to 12 images per minute at certain times), the segmentation of the images, the parallel or dislocated relationship between images and words, the use of cartoon characters or on screen adolescent experts and the online presenter as an *alter ego*. All these elements go to make up an attractive and highly persuasive product.

Bit@bit satisfies all the requirements of a “knowledge communication” program for adolescent receivers since it offers a serious, but interesting and fun discourse. Among the different factors that make that possible—dual presenters, one is a cartoon character but has the same traits that users might have, she is the one who answers back, is ironic, interested in games, programs, skateboarding, etc.; participation of receivers by making them the central characters as true experts in the field, who offer each other advice, help each other, give each other information etc. — the relationship between spoken words and images is fundamental.

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