

¿Cómo analizar contenidos digitales? Una revisión de enfoques para la investigación en proyectos multimodales, transmedia y multiplataforma

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Palabras clave

“Análisis”; “narrativa digital”; “nuevos medios”; “digital”; “transmedia”; “multimodal”

Sumario

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realiza una revisión integradora de 75 documentos que abordan el tema, dejando la muestra final compuesta por los 25 más relevantes para los propósitos de la investigación. La ruta epistemológico-instrumental va desde el Análisis Estructural de la Historia hasta la Visión por Computadora, pasando por la Etnografía Digital y el Análisis del Discurso Multimodal. Las conclusiones incluyen un esbozo de un instrumento de análisis que sintetiza el estudio realizado, revelando previamente el axioma propuesto por varios autores de que no existe un método único e invariable para el estudio de este tipo de objetos. La tendencia, por el contrario, apunta a la atomización de la investigación en aspectos específicos, en lugar de buscar la generalización de resultados y la consolidación de cuerpos teóricos y técnicas universalizables. También se señala que el giro cuantitativo y la programación algorítmica para el estudio de objetos digitales abren una nueva dimensión analítica con capacidades transhumanas que aún están lejos de ser accesibles para la comunidad científica internacional.

Resumen

En los últimos años ha habido una multiplicación exponencial de contenido mediático, plataformas y usos. Tras contextualizar el declive de las grandes corrientes teóricas de la comunicación y exponer el sesgo lingüístico de la semiótica, este artículo propone una revisión y caracterización de los instrumentos referenciales y metodologías para el análisis de objetos textuales, multimodales y transmedia, con especial énfasis en aquellos de naturaleza digital conectada. Con este fin, se

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How to analyze digital content? A review of approaches for research on multimodal, transmedia, and multiplatform projects

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Summary

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integrative review of 75 documents that address the issue is carried out, leaving the final sample composed of the 25 most relevant for the purposes of the research. The epistemological-instrumental route goes from the Structural Analysis of the Story to Computer Vision, passing through Digital Ethnography and Multimodal Discourse Analysis. The conclusions include a sketch of an analysis instrument that synthesizes the study carried out, previously revealing the axiom put forward by several authors that there is no single invariable method for the study of this type of objects. The tendency, on the contrary, points to the atomization of research on specific aspects, rather than to a search for the generalization of results and the consolidation of theoretical bodies and universalizable techniques. It is also noted that quantitative turn and algorithmic programming for the study of digital objects open up a new analytical dimension with transhuman capabilities that is still far from being accessible to the international scientific community.

Abstract

In recent years there has been an exponential multiplication of media content, platforms and uses. After contextualizing the decline of the great theoretical currents of communication and exposing the linguistic bias of semiotics, this article proposes a review and characterization of the referential instruments and methodologies for the analysis of textual, multimodal and transmedia objects, with special emphasis on those of a connected digital nature. For this purpose, an integrative review of 75 documents that address the issue is carried out, leaving the final sample composed of the 25 most relevant for the purposes of the research. The epistemological-instrumental route goes from the Structural Analysis of the Story to Computer Vision, passing through Digital Ethnography and Multimodal Discourse Analysis. The conclusions include a sketch of an analysis instrument that synthesizes the study carried out, previously revealing the axiom put forward by several authors that there is no single invariable method for the study of this type of objects. The tendency, on the contrary, points to the atomization of research on specific aspects, rather than to a search for the generalization of results and the consolidation of theoretical bodies and universalizable techniques. It is also noted that quantitative turn and algorithmic programming for the study of digital objects open up a new analytical dimension with transhuman capabilities that is still far from being accessible to the international scientific community.

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1. Introduction and State of the Art

1.1. *Context: the decline of the great currents in communication*

In contemporary academic literature, allusions to digital disruption and the massive implementation of the Internet are constant, both in the field of social sciences (Roig-Vila *et al.*, 2021; Gutiérrez-Martín *et al.*, 2022) and in the more specific field of communication (Jenkins, 2017; Aguaded & Ortiz-Sobrinó, 2022; Sánchez-López, Bonilla-del-Río & Soares, 2021).

The transformation of the media system inherited from the 20th century, in which press, radio, television and cinema conveyed content flows, has given rise to what Martín-Barbero (2008) first called an “explosion of narratives and pluralization of readings”. Exponential multiplication of contents, platforms and media uses. Lasswell’s paradigm (1985), one of the traditional models for the analysis of the communicational process, is called into question with the redefinition of cultural industries, technological uses, and with the new roles and attitudes of prosumers, as the sustenance of a new global market (Toffler, 1980), and of emirecs and their possibilities for communicational empowerment (Aparici & García-Marín, 2018).

In a parallel movement, the great currents for communication research inherited from the 20th century enter into decline. Carrasco & Saperas (2013) indicate that the dominance of Mass Communication Research and the Critical Theory of the Frankfurt School gives way to diverse models of instrumental research that favor mid-range theories. The generalization capacity of the theory is degraded, following the research approach of Mass Communication Research, with values of a functional nature that are grouped in Media Studies, Communication Studies, Technological Studies, etc.

It is worth mentioning a certain boom in the contemporary popularity of the Media Ecology approach with McLuhan and his famous aphorism “the medium is the message” (1964, p. 203) as its genesis. Let us recall that Eco (1987) questions the McLuhanian thesis about the nature of the media, indicating that the Canadian author calls media, in general, “phenomena that are reducible sometimes to the channel, sometimes to the code and sometimes to the form of the message” (1987, pp. 4-5).

1.2. *The study of content: inherited approaches*

Within the so-called Mass Communication Research, priority was given to two areas of research: the analysis of effects and content analysis, which provides the elements likely to guide the approach to audiences (Mattelart & Mattelart, 1995). Its aspiration is that of “objective, systematic and quantitative description of the manifest content of communications” (Berelson, 1952). For its part, Critical Theory

distances itself from the epistemic-ontological assumptions of positivist social science and empiricism applied to pure and neutral social facts, with a tone preponderantly oriented to theoretical construction. It aspires to social totality and is oriented to emancipation and transformation (Hernández-López, 2013). For Horkheimer (1972), research has its objects imposed on it by virtue of the methods at its disposal, when what should be done is to adapt the methods to the object.

1.3. Theories of linguistic origin: the problem of the unity of meaning

Peirce tried to establish a theory of signs or semiosis. According to him, “a sign or representamen is something that represents something to someone according to some relation or some title” (1974, p. 228). In every semiotic process, three components are related: the sign, the represented object and the interpreter. For Saussure (1945), language is a social institution, while speech is an individual act. As an institution, it is an organized elaboration of signs that express ideas through a codified system. It constitutes, therefore, a structure, segmentable and analyzable. To this end, semiotics and semiology will be oriented as the disciplines that, surely, have gone more deeply into the study of media objects from systematized proposals of analysis.

With the introduction of audiovisual languages in research, the epistemological difficulty of approaching the unity of meaning in the field of semiology becomes evident. Television, radio and cinema expand this conceptual conflict. The linguistic partiality of semiosis generates great doubts when it comes to linking the morpheme to other units of meaning, such as the frame (or the shot) or the photograph (Sánchez-López, 2020). This complexity becomes even more severe with the irruption of connected digital objects, and their differential properties.

2. Method

The main objective of this work is to review and characterize the approaches and referential instruments for the analysis of textual, multimodal and transmedia objects, with special emphasis on those of a connected digital nature. This will lead us, in a univocal way, to link techniques with epistemological frameworks, opening approaches beyond Content Analysis linked to Mass Communication Research. Also, to a question that we will address in the conclusions: is it possible to generate a single analysis tool valid for any media object?

To this end, we will resort to an integrative review modality, which focuses on synthesizing knowledge on methodology, theoretical aspects or on the research conducted outlining a conclusion on a specific topic (Guirao-Goris, 2015).

The purpose of this type of review is to provide a deeper understanding or even create a new conceptualization on an issue. It presents an analysis and synthesizes materials from diverse sources. A hypothesis or conceptual model is identified. The results may constitute a synthesis of existing models or schools of thought or may be a new interpretation of previous data (Grant & Brooth, 2009). For Guirao-Goris (2015), these types of reviews help reconceptualize the view of a problem and contribute to the advancement of the discipline.

The database used for the search process was the Web of Science, which includes the main scientific publications from any discipline of knowledge, whether scientific, technological, humanistic or sociological, since 1945 (FECYT, 18 July 2024). This multidisciplinary, along with the options for topic-based searches and the specific data provided on the articles, along with its leadership position within scientific metrics (Li, Rollins & Yan, 2018), were the primary criteria for its selection in this research. Some older references were included as they appeared recurrently as the theoretical basis for contemporary articles.

Following the objective of the research, the search was conducted through the "topics" section of WoS, using a series of combinations: Multimodal + Analysis, Textual + Analysis, Transmedia + Analysis, Digital + Analysis, Content + Analysis, Discourse + Analysis. The first search through the WoS database was conducted between January 10 and 24, 2022. In a second review phase after an initial filtering, a second search was conducted between February 7 and 13, 2022. Pursuing a certain retrospective view in the analysis methods, no limitations were set on the publication dates, with the time segmentation ending on the last day of the search (February 13, 2022). Taking into consideration the search for a multidisciplinary perspective, no filters were applied by discipline. No linguistic or document type limits were imposed either.

After reviewing 75 documents related to the topic, the 25 that were considered most relevant for the purposes of this research were extracted. The relevance criterion was extracted based on a series of key aspects: 1. Directly addresses the objectives of the article. 2. Introduces replicable analysis tools. 3. Impact (they are a reference in their field verifiable by number of citations or references). The instruments reviewed are presented below along with the specific criteria for their inclusion/exclusion in this article:

Table 1. Sample of instruments reviewed for the research. Elaborated by the authors

	Instrument / technique / approach	Inclusion/exclusion criterion
1	Structuralism Propp, V. (1928). <i>La morfología del cuento</i> . (13a ed.). Fundamentos.	Referential in discipline. Definable corpus, replicable methodology. Structuralism basis.
2	Narratology Genette, G. (1980). <i>Narrative Discourse</i> (Levin. J. E., trad.). Cornell University.	Redundant elements, instruments already integrated in the sample. Synthesis and systematization exceed the object of study and limits of the research.
3	Structuralism Todorov, T. (1972). <i>Gramática del Decamerón</i> . Taller de Ediciones Josefina Betancor.	Redundant elements, instruments already integrated in the sample. Synthesis and systematization exceed the object of study and limits of the research.
4	Semiological elements Image rhetoric Barthes, R. (1964). Rhétorique de l'image. <i>Communications</i> , 4, 40-51. Barthes, R. (1971). <i>Eléments de sémiologie</i> . Éditions du Seuil.	Referential value in the field. Iconic example semiological analysis (Panzani Advertising). Multimodal semiosis (including image).
5	Semiotics Eco, U. (2000). <i>Tratado de semiótica general</i> . Lumen.	Complexity of synthesis. Non-applicability as an instrument.
6	Structural Anthropology Lévi-Strauss, C. (1987). <i>Antropología estructural</i> . Paidós Ibérica.	Redundant elements, instruments already integrated in the sample. Synthesis and systematization exceed the object of study and limits of the research.
7	Film Analysis Mitry, J. (1978). <i>Estética y psicología del cine</i> . Siglo XXI.	Expansive theoretical component. Difficulty of synthesis to show instrument.
8	Language and cinema Metz, C. (2002). <i>Ensayos sobre la significación en el cine (1964 – 1968)</i> . Paidós.	Expansive theoretical component. Difficulty of synthesis.
9	Film Analysis Aumont, J., & Marie, M. (1990). <i>Análisis del film</i> . Paidós.	Extensive theoretical component with the possibility of adaptation for analysis. Redundant elements of instruments already integrated in the sample.
10	Film Analysis Casetti, F. & Di Chio, F. (1990). <i>Cómo analizar un film</i> . Paidós Comunicación.	Theoretical apparatus becomes an instrument of analysis. Audiovisual-film nature.
11	Multimodal Discourse Analysis Halliday, M. A. K. (1978). <i>Language as Social Semiotic: The Social Interpretation of Language and Meaning</i> . Edward Arnold	Redundant elements of instruments already integrated in the sample. Multimodal approach less concrete than the model chosen for the sample.
12	Multimodal Discourse Analysis Baldry, A. P., & Thibault, P. J. (2006). <i>Multimodal Transcription and Text Analysis</i> . Equinox.	Redundant elements of instruments already integrated in the sample. Multimodal approach less concrete than the model chosen for the sample.
13	Multimodal Discourse Analysis Kress, G. & Van Leeuwen, T. (2006). <i>Reading Images: The</i>	Area referential. Not so focused on multimodal corpora.

	<i>Grammar of Visual Design</i> . Routledge.	
14	Multisemiötic artifacts Parodi, G. (2010). Multisemiosis y lingüística de corpus: artefactos (multi)semióticos en los textos de seis disciplinas en el corpus PUCV-2010. <i>Revista de lingüística teórica y aplicada</i> , 48 (2), 33-70.	Redundant elements of instruments already integrated in the sample.
15	Multimodal Metaphor Forceville, C. (2009). Non-verbal and multimodal metaphor in a cognitivist framework. En C. Forceville, & E. Urios-Aparisi (eds.), <i>Multimodal metaphor</i> (pp. 19-44). Mouton de Gruyter.	Redundant elements of instruments already integrated in the sample.
16	Cohesion approach Martinec, R., & Salway, A. (2005). A system for image-text relations in new (and old) media. <i>Visual communication</i> , 4(3), 337-371.	Redundant elements of instruments already integrated in the sample.
17	Multimodal Discourse Analysis Pauwels, L. (2012). A multimodal framework for analyzing Websites as cultural expressions. <i>Journal of computer-mediated communication</i> , 17 (3), 247-265.	Instrument functionality and adaptability. Applicability to multimodal-connected objects.
18	Ethnographic Method Malinowski, B. (1973). <i>Los Argonautas del Pacífico Occidental</i> . Peninsula.	Referential in discipline. Conceptualization and theory make it difficult to present a synthetic analytical instrument.
19	Digital Ethnography Ardévol, E., & Gómez-Cruz, E. (2014). Digital Ethnography and Media Practices. En A. N. Valdivida, <i>The International Encyclopedia of Media Studies</i> , 1-21. Wiley & Sons.	Compendium of approaches from digital ethnography. It allows to visualize the research process attending to the digital phenomenon.
20	Digital Ethnography Hjorth, L., Horst, H., Galloway, A., Bell, G. (2019). <i>The Routledge Companion to Digital Ethnography</i> . Routledge.	Expansive theoretical component. Difficulty of synthesis to show instrument.
21	Grounded Theory and CCM Glaser B. G. & Strauss, A. L. (1967): <i>The discovery of grounded theory: strategies for qualitative research</i> . Aldine.	Referential in the area. Strong theoretical component, with bases for systematization.
22	Grounded Theory and CCM Charmaz, K. (2006). <i>Constructing Grounded Theory</i> . Sage.	Synthesizes the proposal of the main GT and CCM theorists. Concretizes the process and facilitates its implementation. Direct application in multimodal-connected objects.
23	Corpus linguistics, computational linguistics and NLP Clark, A., Fox, Ch., & Lappin, S. (2010). <i>The Handbook of Computational Linguistics and Natural Language Processing</i> . Wiley-Blackwell.	Software-assisted linguistic perspective. On-line analysis against reference corpus. Facilitated by software tools - direct applicability.
24	Computer Vision	Opens the perspective of non-human language.

	Manovich, L. (2021). Computer vision, human senses, and language of art. <i>AI & Society</i> , 36, 1145–1152.	Owned by connected digital cultural objects.
25	Digital Humanities & Art History Brown, K. (2020). <i>The Routledge companion to digital humanities and art history</i> . Routledge.	Techniques used are not replicable. Results drive towards theoretical generation in a specific area.

* In bold, the instruments analyzed in the final version of the research

3. Results

3.1. Instruments of analysis. Inherited models

3.1.1. Vladimir Propp's structural analysis of the short story

One of the first formal proposals that we find for the analysis of content (in this case, literary) is taken up by Propp (1928) in his research on the morphology of the short story. He states that “the forms and the establishment of the laws governing the structure is possible, with as much precision as the morphology of organic formations” (1928, p. 13).

After an exhaustive analysis of a corpus of folk tales, Propp finds a number of constant elements: “One can draw the conclusion that the tale often attributes the same actions to different characters. This is what enables us to study the tales on the basis of the functions of the characters” (1928, p. 32).

The 35 functions are grouped into what Propp defines as “spheres of action” (1928, p. 91):

1. The sphere of action of the AGGRESSOR (or the evil one) comprising: misdeed (A), combat and other forms of struggle against the hero (H), and persecution (Pr).
2. The sphere of action of the DONOR (or provider) which includes: the preparation of the transmission of the magical object (D), and the passing of the object at the disposal of the hero (F).
3. The sphere of the HELPER which includes: the displacement of the hero in space (G), the repair of the misdeed or lack (K), the help during the chase (Rs), the transfiguration of the hero (T).
4. The sphere of action of the PRINCESS (of the wanted character) and her FATHER which includes: the request to perform difficult tasks (M), the imposition of a mark (1), the discovery of the false hero (Ex), the recognition of the true hero (Q), the punishment of the second aggressor (U) and the marriage (W).
5. The sphere of action of the MANDATORY, which includes only the sending of the hero (transition moment B).
6. The HERO's sphere of action, which includes: the departure to carry out the quest (Ct), the reaction to the donor's demands (E), the marriage (W).
7. The sphere of action of the FALSE HERO, which also includes the

departure to carry out the search (q), the reaction to the demands of the donor, always negative (E neg.) and as a specific function the deceitful pretensions (L).

As we can see, and despite the passage of time, Propp’s analysis remains partly valid within the diegetic universe of the story. A model of analysis applicable to works of narrative vocation, but which is difficult to adapt to a corpus of connected multimodal character. His proposal is considered an antecedent of the canonical works of Lévi-Strauss (1958) and Barthes (1971).

3.1.2. Barthes and semiological elements

For Barthes (1971, p. 15), semiology is the part of linguistics that has as its object the study of the great signifying units of discourse. In his opinion, it is from this approach that we obtain the unit of analysis of the investigations that, in his time, were being carried out in the fields of anthropology, sociology, psychoanalysis and stylistics in relation to the concept of signification.

From his perspective, Saussure’s postulates frame all sign systems, regardless of the substance and limits of those systems. Included, therefore, are images, gestures, melodic sounds, objects and sets of substances (rites, protocols, performances) that constitute “if not ‘languages’, at least, systems of signification” (1971, p. 13). This is relevant, embracing the multimodal character within his proposal.

Barthes’ intention with the presentation of what he calls “Elements” is to collect the analytical concepts that he considers suitable to begin semiological research. As he himself clarifies, “a principle of classification of problems” (1971, p. 15). His model is established in a dichotomous way, grouping the elements into four blocks based on structural linguistics:

1. Language and Speech.
2. Meaning and Signifier.
3. Syntagma and System.
4. Denotation and Connotation.

To find the practical implementation of a model of analysis, we must move to the famous study made by Barthes himself on a pasta advertisement in the *Rhetoric of the Image* (1964). In it, he refers to three messages: a linguistic message, a coded iconic message and a non-coded iconic message. In Table 2, a summary of the analysis proposed by Barthes is shown.

Table 2. Summary of the analysis proposed by Barthes in the *Rhetoric of the Image* (1964)

1	Linguistic message	It is supported by articulated language. It can function as an anchor or as a relay (relais) with respect to the iconic message.
1.1.	Anchor function	Articulated language denoting meaning.

		Sign description.
1.2.	Relay function (relais)	Complementary word-image relationship.
		Description of signs and meanings.
2	Denoted image	Uncoded message (literal)
		Sign description.
3	Connoted image	Iconic codified message, symbolic in nature, which appeals to cultural knowledge.
3.1.	Connotators	Signifiers of connotation.
3.2.	Rhetoric	Set of connotators and interpretation.

Barthes (1964) explains that the image, in its connotation, would be constituted by an architecture of signs coming from lexicons (of idiolects) with different levels of depth. Also, that “rhetorics vary fatally by their substance” (1964, p. 49), but not necessarily by their form. This approach, therefore, that of the rhetoric of the image, is specific, in that it is subject to the physical demands of vision. It would not be valid for approaching sample objects with another composition in terms of substance.

In the face of this type of conjecture, the holistic aspiration of some thinkers of semiosis is gradually losing influence in academic circles, which are increasingly giving greater relevance to the nature of the sample and its contextual aspects when it comes to proposing models of analysis that attend to its idiosyncratic aspects.

3.1.3. Film analysis as an awareness and systematic development of research on audiovisual objects

Mitry describes film as a language charged with an aesthetic form, a means of expression capable of “organizing, constructing and communicating thoughts, which can develop ideas that are modified, shaped and transformed, it then becomes a language, it is what is called a language” (1978, pp. 44-45). He defines it as “an aesthetic form (such as literature), which uses the image that is (in itself and by itself) a means of expression whose succession (i.e., logical and dialectical organization) is a language” (1978, p. 45). However, and as Casetti & Di Chio note, it does not possess the compactness and systematicity that allow the emergence of recurrent and shared rules (1990, p. 66).

The decomposition into shots and montage claim their explicit link with cinematography, an assumption with which the Russian school, with Pudovkin, Eisenstein or Vertov, agrees significantly. This theoretical approach leads to a search for grammars on cinema, attending to the units or figures that make up the film. In this sense, it is very interesting to follow the conclusions of Aumont & Marie (1990) in their reflection on the definition of film analysis:

- A. There is no universal method for analyzing films.
- B. Film analysis is endless, because there will always be, in different degrees of precision and extension, something to analyze.
- C. It is necessary to know the history of cinema and the history of

existing discourses on the chosen film in order not to repeat them, as well as to decide in the first place the type of reading one wishes to practice.

The work of Aumont & Marie takes the form of a meta-analysis, bringing together different types of research carried out to date on the phenomenon of the filmic object. Their proposal, therefore, brings together different approaches: “we will consider the film as an autonomous artistic work, capable of generating a text (textual analysis) that bases its meanings on narrative structures (narratological analysis) and on visual and sound bases (iconic analysis), thus producing a particular effect on the spectator (psychoanalytical analysis)” (1990, p. 18), and must also be inserted in the history of forms, styles and their evolution.

Casetti & Di Chio also reflect on the analytical process. They define it as a set “of operations applied to a given object and consisting of its decomposition and successive recomposition, in order to better identify [...] the principles of construction and functioning” (1990, p. 17). A path that aims at the intelligibility of the object under investigation. Casetti & Di Chio’s proposal is shown in Table 3 (1990, pp. 76-77).

Table 3. Casetti & Di Chio (1990) film analysis model

Basic technology codes
1. Support codes · Sensitivity · Format
2. Slip codes · Rate · Direction
3. Screen codes · Surface · Luminosity
Visual codes
Iconicity
1. Iconic naming and recognition codes
2. Iconic transcription codes - Presentation - Distortion
3. Iconic composition codes - Figuration - Plasticity
4. Iconographic codes
5. Stylistic codes
Visual codes (cont.)
Photograficity
1. Perspective organization
2. Margins of the frame
3. Modes of filming
Scale
Fields and planes

Degrees of angulation Degrees of inclination 4. Forms of illumination 5. Black and white and color
Mobility 1. Types of pro-filmic movement 2. Types of effective camera movement 3. Types of apparent camera movement 3.
Graphic codes 1. Forms of titles 2. Didascalic forms 3. Forms of subtitles 4. Shapes of the texts
Sound codes Nature of sound 1. Voices 2. Noises 3. Music
Placement of sound 4. In/off/over
Syntactic or edition codes 1. Associations by identity 2. Associations by analogy/contrast 3. Associations by proximity 4. Transitivity associations 5. Associations by proximity

3.2. Specific proposals for digital content analysis

3.2.1. ADM: Multimodal Discourse Analysis

Discourse Analysis (DA) was a clear trend in the Human and Social Sciences (Santander, 2011, p. 207) during the first decade of the 21st century. It is presented as a transversal discipline that encompasses different approaches: linguistics, sociology, psychology... and a wide variety of contexts. For O'Halloran, ADM "is concerned with the theory and analysis of the semiotic resources and semantic expansions that take place as, in multimodal phenomena, the different semiotic options available are combined" (O'Halloran, 2011, p. 77).

Authors such as Halliday (1978), Baldry & Thibault (2006) and Kress & Van Leeuwen (2006) have worked on the consolidation of a framework based on transcription and text analysis from a broad conception (visual and multimodal). Kress & Van Leeuwen's model had a referential character within the ADM. Its holistic orientation suffers, however, when it comes to taking into account the specificities of digital environments. We do find in this field other types of proposals, such as multisemiotic artifacts (Parodi, 2010), multimodal metaphor (Forceville, 2009) or the compositional cohesion approach (Martinec & Salway, 2005).

Pauwels (2012, p. 252) proposes an approach that combines semiotic elements with the contextual/cultural question in an integral way and

that, moreover, admits in its approach the adaptation of the tool according to the characteristics of the research (2012, p. 251).

A MULTIMODAL FRAMEWORK FOR ANALYZING WEBSITES

- 1. Preservation of First Impressions and Reactions**
 - Categorization of “look and feel” at a glance
 - Recording affective reactions
- 2. Inventory of Salient Features and Topics**
 - Inventory of present website features and attributes
 - Inventory of main content categories and topics
 - Categorize and quantify features and topics
 - Perform “negative” analysis: significantly absent topics and features
- 3. In-depth Analysis of Content and Formal Choices**
 - 3.1. Intra-modal Analysis (fixed/static and moving/Dynamic elements)**
 - Verbal/written signifiers
 - Typographic signifiers
 - Visual representation signifiers
 - Sonic signifiers
 - Lay out & Design signifiers
 - 3.2. Analysis of Cross-modal Interplay**
 - Image/written text relations and typography-written text relations
 - Sound/image-relations
 - Overall design/linguistic, visual and auditory interplay
 - 3.3. In-depth “negative” analysis
- 4. Embedded Point(s) of View or “Voice” and Implied Audience(s) and Purposes**
 - Analysis of POV’s and constructed personae
 - Analysis of intended/implied primary and secondary audience(s)
 - Analysis of embedded goals and purposes
- 5. Analysis of Information and Organization and Spatial Priming Strategies**
 - Structural and navigational options and constraints (Dynamic organization)
 - Analysis of priming strategies and gate keeping tools
 - Analysis of outer directed and/or interactive features
 - Analysis of external hyperlinks
- 6. Contextual Analysis, Provenance and Inference**
 - Identification of sender(s) and sources
 - Technological platforms and their constraints/implications
 - Attribution of cultural hybridity

This diversity in approach, together with wide methodological and terminological divergences in the models, as well as the strong relativism associated with the researcher, has generated certain doubts as to their value in positivist terms. O’Halloran states that “at present,

the terminology of MDAs is used somewhat imprecisely, as concepts and approaches evolve in this relatively new field of study” (2011, p. 120). The major problems of legacy models remain, both analytically and theoretically (2011, pp. 127-128):

- a) Modeling of resources fundamentally different from language.
- b) Modeling and analysis of intersemiotic expansions of meaning as semiotic choices are integrated into multimodal phenomena.
- c) Modeling and analysis of the resemantization of multimodal phenomena as social practices develop.

3.2.2. Digital ethnography

The transition (or hybridization) of personal, communal and also symbolic spaces (and interactions) towards connected and connective digital environments, poses a challenge for ethnographic work and its aim to “give a clear and coherent outline of the social structure and to highlight, out of the mass of irrelevant facts, the laws and norms that all cultural phenomena entail” (Malinowsky, 1973, p. 28).

Various nomenclatures have emerged accompanying this shift: ‘virtual’, ‘connective’, ‘hypermedia’, ‘netnography’, ‘media ethnography’, ‘digital ethnography’... Underberg & Zorn (2013, p. 10) define it as a method of “representing real-life cultures by combining the characteristic features of digital media with the elements of history”. In this sense, “self-identities, social relations and the structure of cyberspace” are relevant areas of research.

San Román (2009, p. 242) presents a proposed methodological sequence for the genesis and testing of hypotheses in ethnographic research, as shown in Table 4.

Design and development of the first ethnographic stage.

Research interests.

Research objectives.

*

Work plan.

Field work.

First ethnographic proposals -hypothetical empirical generalizations, interpretative, causal, teleological and other hypotheses-.

*Several authors incorporate research questions at this point (Kaur-Gill & Dutta, 2017).

Design of the Second Stage of ethnographic research.

Theoretical design and technical design, methodologically oriented to test the hypotheses.

Development of the Second Ethnographic Stage

Aimed at contrasting and measuring the extent of empirical generalizations and proposed explanations.
Normally, new discoveries that lead to the formulation of new hypotheses.

Data Analysis

Conclusions of the verification.
Evaluation of the design proposal itself.

Elaboration of the ethnographic text

Selection of style according to the contents and the academic objectives of application and dissemination.

Ardévol & Gómez-Cruz (2014) consider that “digital ethnography does not establish fixed dichotomies between online and offline spheres”. Kaur-Gill & Dutta (2017) specify that, from an emic perspective, the researcher has to consider his or her relationship with the field, whether online or physically in space. This requires the use of traditional instruments of the discipline, such as field notes, participant observation, conducting structured and unstructured interviews, interim reports... that allow him/her to know the object of study in greater depth.

At the end of the process, the results of ethnographic fieldwork offer a wide variety of data: audiovisual, images, sounds, text, interview transcripts... The ethnographer assumes the role of a bridge between ethnographic techniques (participant observation, in-depth interviews), field experience (immersion, trust building, physical participation) and analysis tools (software for textual and visual analysis and analytical categories) (Ardévol & Gómez-Cruz, 2014, p. 15). Tools such as Atlas.Ti or Nvivo facilitate the data analysis process (always from the previous theoretical construction and taking into consideration the context). They are useful for archiving, generating hyperlinks, visual representation and, above all, for categorizing and coding the data obtained.

3.2.3. Grounded Theory and CCM (Constant Comparative Method)

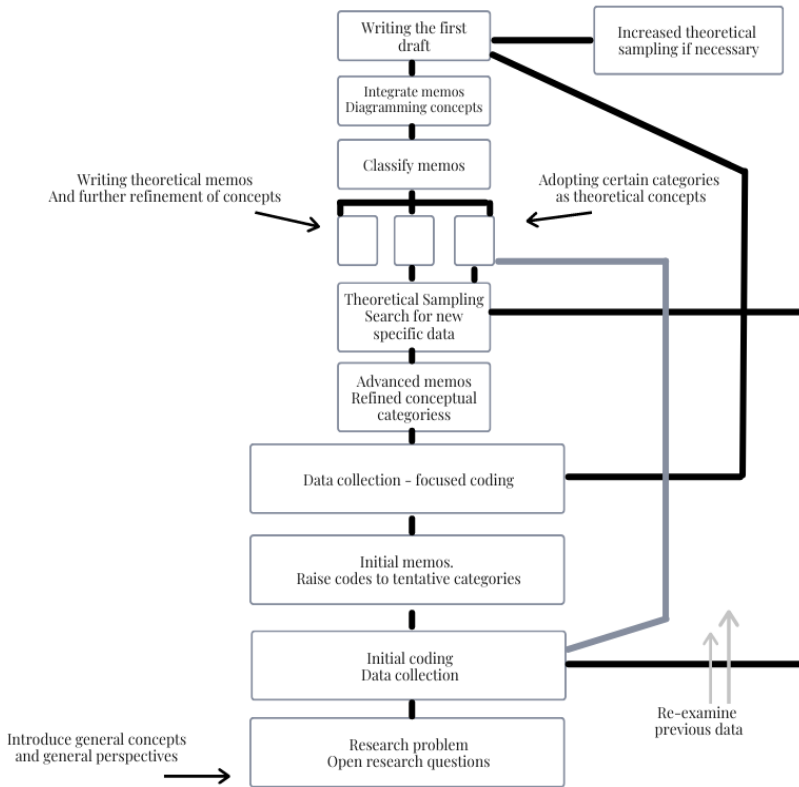
Noble & Mitchell define Grounded Theory (GT) as a research method that is oriented towards theory generation, grounded in systematically collected and analyzed data (2016: 1). Its roots come from mid-twentieth century positivism and Chicago School sociology and its foundations in pragmatic philosophy. According to its precursors, Glaser (1978) and Strauss (1987), its characteristic components are:

- The simultaneous participation in data collection and analysis.

- The construction of codes and analytical categories from the data, not from preconceived hypotheses.
- Advancing theory development during each stage of data collection and analysis.
- Memo writing to elaborate categories, specify their properties, define relationships between categories, and identify gaps.
- Sampling oriented to theory building, not to population representativeness.
- Conducting the literature review after developing an independent analysis.
- Using the CCM (Constant Comparative Method), which involves making comparisons during each stage of the analysis.

Charmaz (2006, p. 11) lists the different steps to be implemented during the Grounded Theory process. They are shown in Figure 1.

Figure 1. Synthesis of the Grounded Theory process by Charmaz (2006)



The constant comparison (CCM) referred to is intended to generate and plausibly propose (not to test) properties and hypotheses about a phenomenon. For Glaser (1965), it is an inductive method of theory development that can lead to a theory of properties or propositions depending on the approach chosen by the researcher.

Grounded Theory, together with the CCM, proposes a systematization of the results, without specifying the techniques to be used to obtain them. Charmaz is very assertive in this sense: “Let your research problem determine the methods you select” (2006, p. 15).

The orientation in the systematization of the process of analyzing the results, together with its flexibility in the application of instruments, have given Grounded Theory and CCM a certain popularity in recent research addressing both multimodal and transmedia objects (Sánchez-López, Pérez-Rodríguez & Fandos-Igado, 2020) and the cultural and social relations that occur in the new connected platforms.

3.2.4. Corpus Linguistics, Computational Linguistics and NLP

Corpus Linguistics refers to the study of language through the empirical analysis of large databases (or corpora) of natural language. By itself, a corpus is an inert archive. But, as Parlington (2006) states, “it can be ‘interrogated’ by means of specific computer programs. The most important interrogation tools are, first of all, concordance, then the frequency calculators, keywords, clusters and dispersion”. In this sense, programs such as Sketch Engine facilitate the investigation of the functioning of language based on the algorithmic analysis of billions of words (corpus), making it possible to identify “what is typical and frequent in a language and what is rare, outdated, in disuse or new words or grammar that are beginning to be used” (2022, Lexical Computing).

CL (Computational Linguistics) and NLP (Natural Language Processing), meanwhile, have achieved a rapid evolution “from being a relatively obscure adjunct to AI and formal linguistics to a burgeoning scientific discipline” (Clark *et al.*, 2010: 1). From the study of small prototypes and theoretical models, it has moved to robust systems of “learning and processing systems applied to large corpora” (Clark *et al.*, 2010: 1), ranging from improvements in data mining for discourse analysis, computational psycholinguistics, to developments in sentiment analysis and opinion mining. Because of its idiosyncrasies and relevance, social network activity (and the massive amount of data produced) is one of the objects of study on which this type of approach is being focused.

4.2.5. Digital Humanities: the limitations of human language

If up to now we have focused on the work of the researcher as the leading figure in the analysis, in this section we are going to introduce software, not so much as an assistance component, but as an executor of the analytical work itself on content, cultural and social objects. Since the end of 2010, various research paradigms have emerged that take advantage of the availability of large volumes of social, cultural and artistic data: Digital Humanities, Computational Social Science, Social Computing, Digital Anthropology, Digital History, Urban Informatics... In parallel, advances in Machine Learning, Computer Vision, Natural Language Processing, Music Information Processing, Lexical Computing... have driven what Manovich calls the “quantitative turn” (2021). Baldwin (2013) defines Digital Humanities as computer services and tools applied to the digitization and processing of text or literature. Champion (2017) extends this definition to non-textual objects.

Manovich (2021) is one of the standard-bearers of Computer Vision Methods within Humanities and Social Sciences research, and he gathers two main arguments to take this perspective into consideration:

1. The data representations of analog cultural artifacts used in Computer Vision, Music Information Retrieval, and Geospatial

Computing offer a new and better language to describe these artifacts compared to natural human languages.

2. These data representations also come closer to how the senses and the human central system encode analog signals.

Following Manovich's (2021) argumentation, the senses translate their inputs into quantitative scales, and this makes it possible "to differentiate many more sounds, colors, movements, shapes and textures than natural languages". And that is why, in his opinion, numerical language is more adequate than human languages to describe the analogical aspects of objects, interactions and behaviors.

Manovich starts from an axiom: human languages are limited, developed late in evolution, and are not good at capturing analogical properties of human sensory and cultural experiences. These limitations are much more evident when it comes to dealing with and comparing large volumes of objects and features. Methods for finding structures and relationships "in large numerical datasets developed in statistics and machine learning, such as cluster analysis, dimension reduction and other fields such as network science, allow us to extend the analysis to massive datasets of cultural artifacts" (Manovich, 2021). Numbers, functions and data visualization also provide a language for representing temporal changes, both gradual and continuous, something that in "natural" languages is more complex to reflect and synthesize.

Despite this clarity of argument, the Digital Humanities are still in an embryonic stage, both in their democratization of application models (much more widespread in commercial and financial environments) and in their development of an epistemological and theoretical-conceptual basis. According to Champion (2017), "Digital Humanities are text-heavy, visualization-light and simulation-poor".

4. Discussion and Conclusion

The decline of the great theoretical currents of communication (Saperas, 2013), together with the emergence of connected digital bodies as an object of study (Casemajor, 2015), have led to a proliferation of methodological approaches with multidisciplinary origins (structuralism, semiotics, ethnography, corpus linguistics, computer science...) to address the analysis of connected digital objects. Our intention with this integrative review has been to transcend content analysis as a method (Bengtsson, 2016), to offer a whole panopticon of instruments of pragmatic character applicable to the investigation of bodies of multimodal on-line character.

Along the way, we find an axiom that is constantly repeated among the authors: there is no single invariable method for the investigation of objects (Aumont & Marie, 1990; Charmaz, 2006). In this sense, it is in line with Horkheimer's (1972) position within the framework of Critical Theory, when he states that it is the method that must be adapted to

the object. There is also a recurrent warning: the need to clearly delimit both the objectives and the sample corpus, taking into account their idiosyncrasies and contexts. There is a perceived atomization of the investigations of particular facts, rather than a tendency to generalize the results and consolidate universalizable and constant theoretical bodies.

This fact does not, however, prevent certain connivances between the different instruments presented. Especially as far as the processes are concerned. Beyond the assigned nomenclature, practically all of them resort to a series of fundamental steps with the aspiration of better understanding the structure and dynamics of the object. Casetti & Di Chio (1990) summarize them in four: segmenting (1), stratifying (2), enumerating and ordering (3), recomposing and modeling (4). The inductive process gains weight from this type of approach. Although at the moment a model or instrument is generated, it is imbued with deductive properties. The film analysis models (Casetti & Di Chio, 1990; Aumont & Marie, 1990) are, from this perspective, the most explicit frameworks for presenting the key aspects of content sampling analysis (for audiovisual objects - films).

We would be entering into an argumentative paradox if we were to present here an all-encompassing instrument. The study carried out does, however, allow us to configure a procedural draft sketch (Table 7), with an orientative function. Far from being offered as a canon, its exposition responds to an exercise of synthesis and syncretism of the study carried out in this article.

Table 7. Draft Proposal of an instrument for the analysis of digital connected objects. Elaborated by the authors

PHASE 1. DEFINITION OF THE RESEARCH OBJECT	
1.1 Define the research interests.	
1.2 Establish objectives.	
1.3 Compile previous literature on the subject.	
1.4 Choosing the methodological approach and techniques.	
1.5 Set the sample/participants.	
1.6 Validation of the approach (reliability check and expert judgment).	
1.7 Design work plan.	
PHASE 2. ANALYSIS - DATA COLLECTION	
2.1. Data subject and context	
2.1.1 Description of the object.	
2.1.2 Author/author's information	
2.1.3 Description of the diffusion platform.	
	2.1.3.1 Contextual Data
	2.1.3.2 Interface
2.1.4 Description of the diffusion technology (apparatus).	
2.1.5 Description of the object-user relationships (emirec).	
2.2. Analysis of diegetic elements	

DENOTATIVES	
2.2.1. Textual Elements	
	Text (CL support)
	Word frequency
	Key words
	Word combinations
	...
2.2.2. Static visual elements	
	Picture
	Colour
	Light
	Scale
	...
	Graphics
	Effects
	...
2.2.3. Sound Elements	
	Music
	Voice
	Ambient sound
	Effects
	...
2.2.4. Audiovisual elements (video)	
	Type (video, animation...)
	Shots
	Framing
	Editing
	...
2.2.5. Multimodal elements	
	Hypermedia
	Interactive objects
	Interactive features
	Virtual Universe Descriptors
	Connectivity/diegetic participation
	Transmedia storytelling
	...
2.2.6. Narrative elements (structuralist perspective)	
	Characters
	Space
	Time
	...
2.3. Analysis of CONNOTATIVE diegetic elements	
Connotation Signifiers	
Rhetoric	
Content purpose	
2.4. Analysis of extra-diegetic elements	
Interface description	
Reaction/incidence	
Connectivity/participation	
PHASE 3. ANALYSIS – INTERPRETATION OF DATA	
3.1 Review of the data from the chosen approach	
3.2 Interpretation of the results based on the established objectives	

PHASE 4. CONCLUSIONS – THEORETICAL GENERATION
4.1 Drawing conclusions (in relation to the objectives set)
4.2 Inferences - Generation of theorizing corpus
4.3 Discussion
4.4 Future lines of research

All in all, we insist, the tendency seen in this study points to a broadening of the approaches, tools and instruments that are being used for the analysis of objects of a connected digital nature, moving away from the unitary and systematic vocation of Berelson’s (1952) proposal. Simultaneously, this entails an emphasis on the need for the researcher to be aware of the idiosyncrasies of the models available, and on the need for his or her choice to be pertinent (always in accordance with the objectives set).

In addition to traditional approaches, not only computer-assisted work has recently been incorporated, but also analytical processes with transhuman capabilities (Manovich, 2021). With the quantitative turn, and algorithmic programming for the analysis of cultural works, the human being, limited to date by language, now has “a new language for describing and talking about art and culture” (Manovich, 2021). According to the author, this would mean the possibility of describing any type of phenomenon with the greatest precision obtained to date in the history of mankind, and a first step “for expanding our knowledge in any domain” (2021).

Brown (2020) has published a volume on art history from the Digital Humanities. Heftberger (2019), the first monograph on Dziga Vertov from data visualization. However, today, only a few global centers have the technology, the operational knowledge and the funding to be able to develop this type of research projects. In this sense, methodologies, sample morphology and research are far from being reappropriated, replicated and scaled up by the international scientific community.

Moreover, the incorporation of gnoseological logics external to human language is *per se* an extensive debate from a phenomenological point of view that will require further deepening by the scientific community.

In such a rapidly changing field, the research presents an evident temporal limitation, making continuous revision advisable. On the other hand, the methodological work could be structured more clearly with the application of the PRISMA method (Page *et al.*, 2021). Several lines of research unfold from the results obtained in this review. The first, and most obvious, would involve the deepening of the quantitative turn and the approach deployed by the Digital Humanities, with the intention of knowing first hand the conceptual frameworks, analysis models, software and processes implemented from this perspective. A second would be related to a systematic review of the research that implements the practical analysis of connected digital content, in order to try to understand which are the approaches and tools that are being most used by the international scientific community.

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