When and how did the Theory of Communication become scientific[1]

Cuándo y cómo se hizo científica la Teoría de la Comunicación

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The Theory of Communication was reconstructed over the last century and has now found its own place among scientific knowledges. This article describes the technological innovations in the field of information and communication than inspired such a reconstruction, and how they have determined their object scope. This paper shows the correspondence this theoretical production has with the reported social changes during the time that globalised monopoly capitalism substituted industrial capitalism.

KEYWORDS: Theory of Communication, Information and Communication Technologies, Social mediation.

La Teoría de la Comunicación se reconstruyó en el transcurso del pasado medio siglo y ahora tiene su propio lugar entre los saberes científicos. En este artículo se describe cuáles fueron las innovaciones tecnológicas en el ámbito de la información y de la comunicación que estimularon esa reconstrucción, y cómo han determinado sus objetos y objetivos de estudio. Se muestra la correspondencia que tiene esa producción teórica con los cambios sociales que se sucedieron durante un tiempo en el que el capitalismo monopólico globalizado sustituyó al capitalismo industrial.

PALABRAS CLAVE: Teoría de la Comunicación, Tecnologías de la Información y la Comunicación, Mediaciones sociales.

How to cite:

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INTRODUCTION

In the future, when and how did the Theory of Communication become scientific will have the epistemological senses that historians studying this time of social production of knowledge will assign. Such senses will be built on the perspective of the status of the knowledges at the time such studies were conducted, although it will not be the phenomenological perspective corresponding to the scientific correspondence of communication tackled in this article –a perspective that relates science with the will of a whole generation of scientists to understand and improve their world–.[3] As members of that generation, we may unveil the sense it makes for each one of us to participate in such a scientific reconstruction. This article is written from that phenomenological perspective, which is, at the same time, scientific, historical and personal.

Describing when and how the Theory of Communication became scientific is necessarily a retrospective representation, but this analysis of the past relates to information required to foresee the developments and functions that communication can assume in the future, which is the prospective position contained in another article published in this same journal under the title "Communication and Information in a virtualising world. Foreseeable developments and functions" (Martín Serrano, 2019).[4]

Both articles present the topic as required by scientific journals –an epistemological and documental piece of work that is justified as far as these publications have theoretical relevance and are proven to be useful for research and teaching–. In order to facilitate these uses, the

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[3]   The scientific and existential scenario where the experience of the scientific reconstruction of communication took place is described in Martín Serrano (2011).

[4]   The stimulus to initiate this task came from the ITESO (Instituto Tecnológico y de Estudios Superiores de Occidente). On the occasion of the 50th anniversary of the implementation of Communication Studies at that University in Jalisco, I was honoured to give a master class on the communicative transformations occurred during that time.

bibliography provides a series of links that allow readers to reach the original texts online.

WHEN AND HOW DID THE
THEORY OF COMMUNICATION BECOME SCIENTIFIC

Stating that "the Theory of Communication becomes scientific" means that an array of hypotheses serving as a basis for making forecasts has been established. This means that such hypotheses may be put to the test –simply that–. This does not mean that hypotheses are necessarily correct, but it implies that they are built in a way that they can be proven wrong. It does not assume that forecasts are necessarily fulfilled, but it provides models to check fulfilment if required.

The theoretical models that meet these requirements are scientific. However, this coincidence does not mean they are permanent, as theories in human and social sciences must be updated or substituted when the objects on which they are applied are transformed.

The good news is that those theories, the objects of study of which are transformed over time, may be verified. Among them, communication theories are verifiable (Martín Serrano, 2007b). Verification involves checking whether the changes forecast by the theory have materialised. It is clear that in order to perform such checking, it is necessary to wait until the moment such changes have been completed, as it is shown in the following example:

In the mid-nineteenth century, Comte made predictions on how societies would function after becoming industrialised. He anticipated that a new job would be created: the *publicists*. They would compose writings that would be distributed to the entire population (thus the term *publicist*). The function of these professionals would be making citizens resign themselves to bear the very negative consequences that industrialisation would have in their lives.[5]

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5   Comte (1972b/1830) describes "publicists" as "the ideologists required by the reform of society for industrialization". Their mission would be creating "the opinions" that would make it possible to control "wishes" (Comte, 1972b/1830). With the control of opinions, it would be possible to

This prediction shows that the Comtean theory was a good predictive tool, but a century was needed to prove that, until the industrial capitalism reached its historic relevance.

The production of scientific theories of communication has been held back to the time when the necessary knowledges were available to formulate hypotheses and make verifiable forecasts. This was achieved over the past half-century:

Communication studies are now where sciences are, because communication theory, research and teaching may be developed following the criteria governing all sciences. This statute makes it possible for the contributions of communicative studies to be used in any other field of knowledge, and vice versa (Martín Serrano, 2013, p. 16).

The narrative of this scientific substantiation is very interesting. A way of telling such a story is based on relating the transformations of theories, technologies and societies. The story we are about to narrate deals with these relations.

The production of theory is activated following the invention of technologies, the social use of which eventually irreversibly transforms the organisation and functioning of societies. Irreversible social transformations are sociohistorical changes. And the technical innovations of communication have directly participated in successive sociohistorical changes:

• The invention of writing resulted in an irreversible social transformation, as it allowed the transcription of thoughts.

introduce and maintain the submission of those suffering from insecurity, and the deprivation work division would entail. To this end, Publicity would identify personal security with conformity. Please note the following quote: "how sweet it is to obey when one enjoys happiness … of being conveniently absolved of the urgent responsibility of the general direction of our conduct by wise people and valuable managers" (Comte, 1830/1842). To learn more about Comte, industrialization and communication, please see Martín Serrano (1976).

- Printing allowed the multiplication of text copies.
- Electronic communication media made it possible for messages to instantly reached any part of the world.

During the half-century to which this article refers (1968-2018) computer-communicative technologies have been incorporated twice and their uses are producing sociohistorical changes. We must remember the moment these events took place, what innovations were provided, and their sociohistorical consequences.

FIRST INNOVATION: THE INCLUSION OF TELEVISION SETS IN HOUSEHOLDS

Television sets were incorporated in Spanish households in the sixties. As is known, TV sets were the first gadgets to be widely used for the dissemination of audiovisual contents in a synchronic way –sounds and images are received at the time they are being captured and broadcast–. These images and sounds may come from references.[6] That is to say, they were collected from the places, people, and objects about which they are informing. For example, when a concert is being broadcast live; from that moment, communication may work independently with respect to the event. These are the innovations that transform audiovisual communication into referential communication.[7]

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[6] The "Objective of Reference of Communication" is the entity about which it is communicated. The concepts "objective of reference" and "reference data" are systematically described in Martín Serrano et al. (1980/2007a, pp. 177-190).

[7] Communication is referential when it has the following characteristics:
1) It is possible to refer to any entity. It is necessary to communicate about entities that existed, exist or will exist (nature elements, objects, manufactured objects, vegetables, animals, human beings); entities that never existed, do not exist and never will (fiction or mythological entities, to which the character of things, objects or living beings are attributed); qualities, manifestations, relations, or actions –whether they are observed or unobserved, conceivable or unconceivable, which are assigned to any

SECOND INNOVATION:
CREATING THE NETWORK OF NETWORKS

The second incorporation of computer-communicative innovations, the use of which are resulting in sociohistorical changes, started back in the nineties, when the network of networks was created and the services and applications that allow operability on the Internet were created.

These technologies push the interactive potential of communications to the limit. As is known, they –initially– allow every Internet user to exchange information instantly with any other user, anywhere. These are the innovations that transformed unidirectional and multidirectional communication.[8]

The main new feature that brings the first of these two innovations –referential communication– is that narratives no longer require a mediator describing or explaining what is happening. In most cases, those receiving such narratives may identify, understand and interpret the information contained therein by them.

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real or ideal entity–, whether they are individual or collective, possible or impossible; to what exists or does not exist; to what happens and what does not happen.

2) There are expressive resources to determines what is real or virtual, what is true or false.

3) It is necessary to use all kinds of symbols in narrations – sounds, icons, abstract symbols.

In a nutshell: communication is referential when any entity, behaviour, or representation may be incorporated to the communication universe as an object of reference (Martín Serrano (1986/2004b).

[8]   Whenever a person is able to communicate instantly with another person, anywhere, the following changes in the social production of communication may occur: 1) the technical division between information producers and consumers is reduced to merely instrumental aspects; 2) the communicative interactions among human groups stop being constrained by space and time separations; 3) and, mainly, the integration among informative and communicative systems that make it possible to access shared knowledge, memory and collective creativity (Martín Serrano, 1986/2004b).

The main innovation multidirectional communication brings is that any person may be a mediator. They may introduce, eliminate, select, modify, or disseminate oral, written or visual materials on networks.

Both innovations are related in sciences and practice, but their timings differ and require analyses with different methodologies:

- The applications of referential communication and their effects are part of the history of communication. These results are exposed, and may be subject to retrospective analyses, which are presented in this article.
- The social applications of multidirectional communication emerged during the nineties. They are still in force and their interactive potential will presumably continue developing as the world virtualises. However, future scenarios may be described that may be considered at present by using prospective methodologies. This is what is done in the article "Communication and Information in a Virtualising World. Foreseeable Developments and Functions" (Martín Serrano, 2019).

The following refers to referential communication –the communicative innovation that has accompanied the scientific build-up of communication studies and determined its first aims and objectives–.

Referential communication realises a utopia that was idealised back in the 15th century –the utopia of the referential appropriation of the world–. It believed that the development of the instruments of communication would make it possible that, at some point, each person would receive immediate notice of everything, anywhere.

The "utopia of the referential appropriation of the world" is related to the expansion of capitalism ever since the times of discoveries. This was a necessary resource to ensure capitalism could progress while seeking "the material appropriation of the world", as it is not possible to expand control over the environment, in the absence of information about such environment.[9]

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[9] Utopias are the first forms in which society models leading social action are described. They are distinguished from deliria because the model proposed

This is the main reason why for 500 years, the successive scientific-technical revolutions have insisted in the creation of communicative infrastructures; the invention of tools and applications that would increase speed, coverage and accuracy of technologically mediated communication.

As is known, "communication technologies and social control" were simultaneously and closely developed until the technological innovations tackled in this paper emerged.

Both referential and multidimensional communications require a greater deal of independence by users. As a consequence, they may reduce the efficiency the social production of communication has to keep social control, because, as population develops its autonomy, a greater diversification of social representations is produced. And such a diversification generates dispersion in collective behaviours.

In our society, which has referential information open to multiple contacts at its disposal, it is more difficult to keep social consensus. This weakening must be solved, as consensuses are links that unite the members within a community. Should they be lost, social cohesion would crack, shared identities would break apart, and collective projects would vanish.

Ultimately, socialising institutions are aimed at creating and keeping such consensuses. As is well known, social communication is one of these institutions, which is as determining –or even more– as family, school or church in terms of social reproduction. This scenario must be placed in the sixties, when important reasons compelled to figure out to the extent and the way public communication would continue to play its socializing function.

The existing theories at that time had been developed to explain the impact of "social communication" (this is what it was called then) over

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are implicit in the status which the real world has reached. If lucky, utopic contents end up materializing in social organisations. For instance, human rights have granted legal coverage to the egalitarian utopia the French Revolution attempted to establish. In fact, our present was mostly the utopia of the past. For instance, referential communication –the one described in this article–, is a utopia that have materialised (Martín Serrano, 1986/2004a, pp. 109-110).

"mass societies".[10] But these theories progressively lost their validity when used to understand the influence of referential communication. Such inadequacy was owed to the fact that the transformation of public communication corresponded to social transformations equally irreversible, in this case with the transit from industrial capitalism to globalised monopoly capitalism.

Initial researches focused on determining the impact referential communication has on consumption; mainly when disseminated through television, as viewers who understood what was being said and identified what they were watching would be able to interpret what was occurring according to their own criteria, even if they could not read. This would make it no longer possible to have an influence in audiences, by exclusively referring to the authority attributed to professional mediators.

These researches were interesting for those who concurred in goods and services markets –for obvious reasons–, and also for those with a critical view of market economy. Both parties took into consideration –for different reasons– the way in which they operate with the needs in public communication, especially advertising.

The Theory of Ideologies stated that "mass communication" kept market economy functioning, on the basis of the creation of "fake" needs. And it was true that, in advertising, messages appealed to needs, as confirmed by a content analysis of purchase motivations used in all advertisements broadcast on Spanish television since it was established. But this study also checked that most needs managed by advertising were not fake.

In fact, advertising campaigns sometimes managed to link the purchase or consumption of specific goods to the satisfaction of social requirements conditioning existences. In such cases, those consumption behaviours are "social needs" as they are no longer optional. The

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[10] It is necessary to list the main theories available to explain the form in which "social communication" influenced "mass societies" –behaviourist, functionalist, Marxist, and culturalist theories–. They all functioned relatively well to explain the effects of "mass media" –mainly written press and radio–, and when political propaganda or cultural creation produced and disseminated by such media were contrasted.

acceptance of consumers by others is at stake –occasionally, work or income; and always, self-esteem–.

The conclusion is that advertising *persuades*, when it manages to relate the consumption of products or services advertised with the needs people must satisfy to keep their status and perform their social roles. Advertising had learnt to capitalise real needs.

That was my first research (Martín Serrano, 1970). I was a young lecturer then, who taught theory and methodology of social sciences at the Universidad Complutense, where I still work. However, it played a significant role, as other authors who were more recognized than me, disseminated my conclusions.

This unusual response may be explained. Critical sociologists had ruined the conspiracy conception of social communication. It was no longer believed that audiences were formed by brainless masses unable to understand their true interests. And it was no longer maintained that communication worked as a syringe that "injected" in their consciousness the indoctrination prepared by mass manipulators. Surveys stated clearly that this interpretation of the effects of public communication was erroneous. They showed that youngsters had access to plural communication –which they used– and were willing to participate in *cultural* revolutions, to a certain extent.

In fact, it is known that in 1968 youth movements raised demands that have resulted in –among other achievements– antibureaucratic socialism, pacifism, environmentalism, feminism, and sexual liberation.

Those who inspired these movements, and those who performed them, were not willing to substitute capitalist market economies for the planned economies of socialist states, because they considered that surpluses, full employment, and subsidies coming from public budgets were already irreversible achievements; as well as the free plural debate about the state and the construction of the world. But especially, because they took for granted that the generation of resources and necessary social services would be kept.[11]

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[11] As an example of the confusion of that time, the members of the Rome Club also forecast "economic growth", based on the expansion of the same consumption model within the market economy.

With the passage of time, these future visions have unfortunately been proven wrong. Youth movements believed they had given birth to the "post-industrial society of well-being". In reality, this economic and cultural prosperity of the sixties was the swan song of industrial capitalism, while it was being substituted by monopoly capitalism. But this verification was not possible until 1973, when the first global economic crisis shattered the hopes of uninterrupted economic growth.

Until that year, communicative, cultural and university agendas kept working on the way the society of abundance and freedoms would be constructed. It was thought that television was already orienting such dynamics, and the conceptions of societies and their members broadcast in such media had to be identified.[12]

The way such conceptions were investigated was evident –analysing the content of televisual narratives–. But the techniques available at that time had been designed for written or oral texts. Other methodologies had to be created to analyse audiovisual narrations.

Existentialist philosophers, semiotic linguists, structuralist cultural anthropologists, dialectic critical sociologists, constructivism genetic psychologists, culturalist psychoanalysts from projective analyses and cybernetics from systems and information theories were involved in this task.

All these expectations were filled with creativity in the same place and at the same time –France, during the sixties until the second half of the seventies–. The reason to such an important epistemological concurrence was the following: this was the time when it was proven that the social production of communication was a component that had to be taken into consideration in each one of the fields of study, because communication was implied in both anthropogenesis and sociogenesis; in ontogenesis and socialization; in the functioning of the mind and knowledge; in the creation and recreation of culture; in the structure and the performance of social organisations and their institutions; and in the planning and development of social action.

These theories and methodologies include most human and social sciences. This concurrence had never happened before and has never

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12   There is a description on how the change of paradigms happened in the theory of communication, which accompanied the transformation of industrial societies into globalised monopoly societies in Martín Serrano (1977).

been repeated. They were re-built together to analyse and understand the visions of the world that related with technological innovations. Such representations transformed the social production of communication into social controls. As far as I am concerned, those theorists did not claim for the title of *communicologists*, but they were indeed the ones who created communicology.

I was lucky to be in that place at that time participating –precisely– in those theoretical and methodological explorations. I was given the chance to participate by Professor Abraham Moles, who created the cybernetic paradigms applied to research on culture and communication at the University of Strasbourg. My relationship with this much loved and admired researcher started in a congress where I described the models I had elaborated to analyse the spots I mentioned before. These models are based on logics. Professor Moles –due to his cybernetic profile– immediately understood the possibilities of these methodologies to identify narrative structures.[13]

I travelled to Strasbourg to make a State Doctorate under the direction of Professor Moles. My aim was to develop these basic methodologies, so they could be applied to the study of any type of representations –mental, conversational or narrative–.[14] And we agreed on verifying their relevance in television narratives.[15]

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[13] At a logical level, there are isomorphisms between the codes of social control (rules, coercions, prohibitions, etc.) and the narrative codes of communication (inclusions, dependencies, exclusions, etc.). In both cases, the codes organize the relation between the elements configuring representation structures. For further information, please read Martín Serrano (2008).

[14] The systematic development of logical methodologies so they could be applied to the analysis of any representation is part of the doctoral thesis *L'Ordre du Monde a travers la T.V. Structure du discours électronique* (Martín Serrano, 1974a). Since then and to date, there are several publications with the successive methodological developments and their applications. One of the written presentations on the explanation and application of these methodologies is available for download at Martín Serrano (1974b).

[15] Two content analyses of the programmes of the Spanish Public Television corresponding to, firstly, 1970 and, secondly, 1971, served as research

Approximately, three out of four cases of narrative structures of television narratives corresponded to one of the following two models (either parabolas or feats):

•   The *parabolas* are narratives in which the approval or disapproval of characters is portrayed, when their behaviours affect the community.
•   The *feats* refer to how much we owe *heroes*, who are the ones protecting us from the enemies that want to destroy our communities. They assumed that heroic function in the narratives of our times, mainly politicians, police officers and judges (Martín Serrano, 1998).

Parabolas and feats link within the narrative development, what must be done, with what is considered appropriate to believe, wish, or hope to guarantee the functioning and perpetuation of the community. In this way, *models to guide the action* are elaborated, which are representations through which cognitive mediation is made in communication.[16]

The validity of the mediated representation is reinforced in the narration by operating on the basis of rewards and penalties. Behaviours leading to the preservation of the order established within the community will be rewarded. Such rewards are materialized in the acceptance granted by "our people". To be more precise, it focuses on avoiding the rejection from our people.

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base. The samples amount for 110 hours of broadcast and 180 advertising spots. The sample selection was made randomly, distributed according to programming quotas and narrative genres. The researches were funded by UNESCO and the INCIDE –an institution created to direct the Spanish educational reform–. The Spanish Public Television also collaborated in recording the materials.

[16] "Cognitive mediation" and "structural mediation" are two different variations of the effort made by mediating institutions to provide an identity that could serve as a reference for the group, preserving their cohesion of the disaggregating effects of social change (Martín Serrano, 1985). For further information see Martín Serrano (1986/2004a).

Rejection implies marginality or exclusion, a situation that entails failure or even death, which is an outcome from which members can learn with no need to explicitly formulate any kind of prohibition or threat.

These narrations link the identity and the safety of each person to their integration in their groups. They are operated with the most important of human needs: the need to be part of a community (Martín Serrano & Velarde Hermida, 2015).

The feats and parabolas are the most ancient narration that have been transmitted orally and that have lasted ever since they were written. It was fascinating to prove that these original narrative structures, which describe and assess behaviours according to collective reproduction, were used when public communication became referential and the audiovisual resources television provides were available.[17]

In television narratives, assessments are established on the basis of the performance of social roles. Programme schedules present an abundant "array" of roles. Certain typologies are repeated in all narrative genres and different situations –mainly roles relating with family, jobs, age, public administrations, politicians, sports, etc.–. The features and behaviours of the characters performing such roles illustrate, in each field, who succeeds and who fails.

As a result, these analyses determined that television was not merely transposing the vision of the world governing during the industrial capitalism into another narrative language, because different characteristics of television role models opposed to the basic characteristics of role models in force in industrial societies. Table 1 summarises these counterpoints:

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[17] Further content analyses accumulated evidences proving that invariable structures of feats and parabolas –both in television and written media– are adaptations of the structures operating in myths and tales. These are adaptations promoting and reproducing the visions of the world corresponding to the social system in force at every moment (Martín Serrano, 1986/2004a).

TABLE 1

COMPARISON BETWEEN THE MODEL OF THE WORLD OF THE INDUSTRIAL
SOCIETY AND THE MODEL PROPOSED BY TELEVISION

	Ideological image of the industrial society	Ideological image of society shown on television
Archetypical role	Innovative, who ventures to leave the endogroup	Reproductive, who remains linked to the endogroup
Reward	Prestige, fame, power	Social acceptance
Aim	Channelling energies towards work (assessment of productivity)	Channelling energies towards system reproduction
Utopia	Abundancy	Security
Controlling impulse (and therefore, preferred content in narratives)	Sex	Aggression
What is prohibited (and, therefore, desired)	Pleasure	Violence
What is accepted and promoted	Competence	Eroticism
Type of characteristic society	Universalist Rationalist	Bureaucratic Charismatic

Source: Martín Serrano (1977, p. 169).

The counterpoints between the model of the world of the industrial society and the model proposed by television are described in Martín Serrano (1977) and summarized in the following note.[18] Television was

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[18]   -   The industrial society lies on universalism (Parsons, 1966). Television is rooted in particularism.

-   The industrial society requires neutrality in affections (Weber, 1967). Television imposes compulsive affectivity.

describing another society, a model of society named "post-industrial" by publicists and "monopoly capitalist" by political economists. This is a new order that twenty years later would be identified with

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-   The industrial society is focused on the purchase of objects through the repression of impulses (Galbraith, 1969). Television maintains purchasing pressure through a counter-sublimating mechanism that floods reality with primary impulses.
-   The industrial society is a system of approvals (Fromm, 1967). Television offers love instead of prestige.
-   The industrial society defines passion as a productive action (Marcuse, 1965). Television describes it as passivity.
-   The industrial society proposes irrepressible ambitions that set more and more unattainable goals (Merton, 1961). In television, ambition is simply submission without altruism.
-   The industrial society spurs initiatives through competitiveness (Schumpeter, 1968). Television rejects initiative. A competitive character fights against definitions and rules that do not belong to his/her group and not against the other member of the group
-   The industrial society, the efficiency of scientific management and not the existence of exceptional men/women (Taylor, 1911). Television makes safety lie on the action of charismatic leaders.
-   The industrial society imposes particularism in wishes and submission to rules (Veblen, 1964). Television requires the universalization of wishes and the revitalization of rules. It bases solidarity on "the community of wish".
-   The industrial society proposes hedonism as a tool of behaviour (Veblen, 1964). Television proposes safety.
-   The industrial society fears sexuality (Horney, 1964); opposes sex to culture (Freud, 1968); submits pleasure to productivity (Reich, 1952); and transforms eroticism into luxury (Sombart, 1965). However, television employs sexuality as an ethnocentric link. It frees the Eros of productivity and places it at the service of consensus. It democratizes eroticism and offers it as a technique to be accepted. Sexual pleasure –understood by the industrial society as a field of private satisfaction– happens on television to the domain of collective activities.

"globalisation". This change of era had already initiated, although those who were experiencing it did not realise.

I started this work in 1968 and concluded five years later with the Paradigm of Social Mediations and the implementation of its logical methodologies, initially published in French (1974). In Spanish, it was published in the book *La mediación social* (Martín Serrano, 1977). This delay was due to difficulties attributed to the censorship of the time.

CONCLUSIONS

It was concluded that the social production of communication was still being used to influence and persuade; and that "cognitive mediation" continued to relate what had to be done with what must be believed, to guarantee the functioning and continuity of communities. In the perspective of the sociohistorical change, which was moving towards the existing society model, the vision of the world proposed by television was no longer –as it was believed–, the vision of "the society of abundance", but rather the vision of "the society of redundancy". That is the expected vision in order to guarantee the social transformations that were developing could happen:

> … television opens a new mythic cycle. If the momentum that characterized the industrial society could be described as the Prometheus myth, the society that television presents may be described through the myth of Abel, "who always remains under the gaze of the Father". This new vision of the world is not about bringing fire to the home, but rather maintaining it. We would not describe the world proposed by television as the society of abundance, but rather as the society of redundancy (Martín Serrano, 1974c, p. 13).

But this social production of communication, as part of social mediation, is something much more important than a resource to influence and persuade. It is an activity used to share information, to keep organizations functioning, and to coordinate social action. This is because "mediating" means "operating with the action that transforms, with the information that conforms, and with the social organization that links to introduce a design" (Martín Serrano, 2007c, pp. 9-27).

The Paradigm of Social Mediations is a theoretical and methodological development to work at this level of the adjustment, in which informing, conforming and transforming are interdependent processes.[19] When mediated systems are investigated or described by human design, it must be taken into consideration that these three dimensions function inseparably. This is an important observation for those working on the influence of communication and the rest of mediating instances.

The Paradigm of Social Mediations identifies a macro-sociological process operating in all societies and all times. Social mediations are involved in the orientation of the actions that, when transforming the world, either preserve it or put it at risk; in the formation of the organisations that free or oppress; in the representations that humanize or dehumanize.[20]

Mediation is a social activity that cannot be separated from the effort to control changes according to human designs, as long as the "activity" is not subject to assessment. However, the designs and applications used by mediating institutions can be dissociated.

This article refers to a time in which communication became referential and the theory of communication became scientific knowledge. This stage has been analysed retrospectively, because it was initiated in the seventies and lasted until the nineties, when referential communication merged with multidimensional communication. Since then, communication and information share the digital networks that set the technological grounds to create a virtual "space".

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[19] Sciences dealing with the physical world are built in reference to material, energy and information. The components of the world mediated by human design with which social and human sciences are constructed are the social action, organisations and information. In order to understand the states and the transformations in each "world", we must understand that their respective components function inseparably.

[20] Available at E-*Prints* (2011) a systemized and accessible collection of "Publications of Manuel Martín Serrano on mediations", including a selection of texts referred to the Theory of social mediation; cultural mediating institutions. See in https://eprints.ucm.es/13287/

For as long as virtualisation has existed, social mediations have experienced an extraordinary transformation. Social action, organization and information –the dimensions with which social mediation operate– are not only related, but they are also interchangeable on occasions. The following are the transfers generated:

• When the action is substituted by information, and vice versa.
• When the institutions are computerised and move from material organisations to online programmes.
• When face-to-face communication is substituted by virtual communication.

Therefore, I state that "virtualisation" may be understood as a socio-historical transformation that is removing the barriers, both technical and material, that limited the resource of social mediation. It is understood that the studies on social mediation have gained even greater relevance.

When virtualisation operates, the narrative of the links among theory, technologies and society must adapt to such transformations in social mediations. Since this is an ongoing process, it must be described prospectively. It is the transformation –at the same time scientific and socio-historical–presented in the article "Communication and Information in a virtualising world. Foreseeable developments and functions" (Martín Serrano, 2019).

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