



Media content analysis of stem cells boundaries in Spain: Speech act theory, performativity and literacy in action

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ABSTRACT

This paper will give an account of how the term *performativity* has been a much disputed subject within the field of linguistics, gender studies and actor network theory. And how it provides a theoretical framework of researching biomaterials as eggs in these technologies, which will facilitate new cultural patterns of analysis in IVF - Stem Cells - Cloning boundaries and policies. In an attempt to explore the crossing character of these biomaterials in the biotechnologies, it was analysed 2006 year since a new *Assisted Reproduction Act* was passed and the first *Draft Bill of Biomedicine* was launched in Spain. Selecting the texts from the two main national newspapers in Spain, were coded by a qualitative analysis program to set their dynamics through IVF, Stem Cells and Cloning news. Data management and analysis was done by a quantitative statistical program. Once texts were coded, linked and marked, the process of model specification was carried out. Through speech act theory and performativity, it was possible to study the discursive practices shown in these biotechnologies where identities are positional, unstable and contingent but supported by the requirement for negotiation. Therefore, this paper offers a new approach to include gender studies in media content analysis of embryo economies.

KEYWORDS

Performativity; Praxeology; Embryo economies; Media Analysis; Speech act theory; Boundary work; Biomaterials.

INTRODUCTION

The main objective of this paper is to explore the role of media and gender in IVF, Cloning and Stem Cells boundaries in order to anticipate more holistic models for innovation studies and policies. Nowadays, it is difficult to consider IVF, Stem Cells and Cloning as separate scientific and clinical practices. Even, notions as *IVF – Stem Cells Interface* (Franklin, 2006) show us the necessity of creating new concepts in order to give account the flows and dynamics that cross their boundaries. In this case, Sarah Franklin (2006, p.72) refers to ‘the national embryo supply in UK and the “double reproductive value” of hES cells in order to model the transitions in meaning, value and form that characterize this emergent and contested field’. This kind of knowledge production implies interdisciplinary researches and wider sociodynamic models involving issues as: patient perceptions of embryo donation, media representations of these controversies or eggs donation.

One question that needs to be asked is the involvement of alternative social discourses and agents. Although these emergent concepts, as Franklin’s one (2006), provide new and wider frameworks of analysis, they are still focused on embryo policies, or the so – called *embryo economies*. That means, the potential holistic model these notions provide tends to be reduced into patterns of cultural normalization. An example of this is how difficult is to find media representations of women in IVF - Stem Cells - Cloning boundaries. Even it is becoming increasingly difficult to ignore the role played by women bodies on these controversies, there is a limited number of gender issues involved into media rhetoric (Kitzinger, Williams, Henderson, 2007).

The interdisciplinarity of performativity

Several developments in humanistic and scientific fields have heightened the need for exploring the study of discursive practices. Even performativity embodies a multitude of concepts in different research fields, i. e. queer theories, literary studies or theatre studies. As Judith Butler (1988) points out, theories of performativity tend to link discursive practices and semantic meanings in philosophical contexts. John Searle’s speech acts theory (1980) is a way to constitute not only speaking relationships, but also a moral bond among speakers: ‘the phenomenological theory of “acts”, espoused by Edmund Husserl, Maurice Merleau – Ponty and George Herbert Mead, among others, seeks to explain the mundane way in which social agents constitute social reality through language, gesture, and all manner of symbolic social sign’ (Butler, 1988, p 519). In another development Donald Mackenzie and Judy Wajcman (1999) contrast the main characters of a performative definition of the social link against an ostensive one. By this performative view, it is highlighted how the social link is constructed by different social actors, which are also performed in this process. One of the consequences of introducing the performative understanding of science and technology is the emergence of concepts such as *boundary – work*. This term describes ‘an ideological style found in scientists’ attempts to

create a public image for science by contrasting it favourably to non – scientific intellectual or technical activities’ (Gieryn, 1983, p. 781). When scientific authority begins to be claimed by different knowledge makers (i. e. civil society) and performed by different post – humanist subjects (i. e. cyborgs, nomadic subjects), scientific boundaries appear as clear tools of power. According to Gieryn (1999), *boundary – work* supposes a sociological research of authority of science, which explains how scientific practices are based on rhetorical dynamic boundaries between insiders and outsiders, experts and lay people.

Linguistic Turn

Over the past century, there has been a dramatic increase in the study of language not only as a system with its particular laws, but also as a locus where all social practices are constructed. Both trends emerged with Ferdinand Saussure and Charles Peirce, which set the precedents of the anglo-american and continental versions of semiotics respectively. While Saussure tended to highlight the social aspects of the sign, Peirce referred to formal aspects of meaning.

Anglo – American semiotic

Charles Peirce was one of the Morris’ predecessors, becoming one of the first references on the pragmatic study of language. In fact, Morris’s (1938) principal aim was to reconstruct the Peircean theory of signs. However, Peirce’s theory of sign was undiscovered for many years. The innovative feature of the Peircean theory of sign was its triadic dimensionality (Nöth, 1990, p. 42):

A sign, or representamen, is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea.

This kind of theoretical changes had a serious effect in humanities and even social sciences, through the so – called linguistic turn. During the thirties, K. Bühler (1934) also set a precedent for further researching of pragmatics in linguistics. His work not only had influenced the Vienna Circle but also the earliest distinctions among pragmatics, syntax and semantics made by Charles Morris (1938) and later Rudolf Carnap (1942). In his Organon Model, Bühler (1934) represented linguistic sign like a triangle composed by three sides: the Object of reference of the sign, the Speaker that emits the sign, and the Hearer that receives it. In addition, he researched three different functions of language depending on the possible relations of the linguistic signs with the Objects, Speakers and Hearers. In fact, representation (σ, o), expression (σ, s) and appeal (σ, h) were the main linguistic functions by Bühler.

The Organon Model made possible the earliest formulations of pragmatics by Morris (1938) and Carnap (1942). In fact, the first semiotic distinction done by Morris was supported by Bühler’s model even introducing some changes. According to this, semantics studied the relations of signs and objects, syntactics studied the formal relations among signs and

pragmatics the relations of signs with interpreters (Morris, 1938). In spite it is considered an unsatisfactory introduction of pragmatics (Searle, et. al, 1980), it was a real influence through Carnap's similar reformulation Carnap (1942) where the whole science of language, consisting of the three parts mentioned is called semiotics. Furthermore, Morris' and Carnap's framework made possible the emergence of different currents of pragmatics and how meaning is understood. The linguistic semantics dissociates the sense given in a system of linguistic relations from their use. The main Anglo – American current of pragmatics is that one, in which the meaning of expressions is considered as their own use.

This idea of considering semantic like its own pragmatic use or performance has strongly influenced the development of currents tendencies or researches like post-structuralism, gender studies, cultural studies, etc. One of the most important developments in this field is the speech act theory. In spite of the fact that research of theories of speech acts have been rarely applied in empirical research (Holtgraves, 2005), this kind of philosophy is now being successfully developed in gender studies and media content analysis. According to Butler (1999, p. 25):

Thus speech belongs exclusively neither to corporeal presentation nor to language and its status as word and deed is necessarily ambiguous. This ambiguity has consequences for the practice of coming out, for the insurrectionary power of the speech act, for language as a condition of both bodily seduction and the threat of injury.

In this sense, leaving behind traditional theories in which sentences were the minimal unit of communication (Searle et al., 1980), the action dimension in language is included through the analysis of language performances i. e. apologizing, giving orders, thanking, etc. Thereby, speech acts became an useful tool in order to research how social processes are being represented, communicated and performed (Bell & Blaeuer, 2006). Even speech acts will be considered as social agents. That point is specially important in media analysis and the material agencies it involves. In that sense, Leander and Lovvron highlight (2006, p. 536):

In other words, speaking of non – human agency does not mean that we stop thinking about the humans who designed and set them up. On the contrary, most of the time, we attribute agency to non – humans because we know that they were humanly created for a specific purpose. For instance, if we say, 'this article incriminates the president', we, of course, know perfectly well that articles are texts that journalist write, and it is actually because we know this fact that we can specify what the article is doing, whether the journalist intended it or not.

Continental semiology

Saussure improved the study of the language as a semiotic system, where signs should be the units of analysis instead of words and sentences (Tobin, Y., 1990). This semiotic research was also extended to different fields of knowledge. Social practices began to be considered

languages with their specific flows of meanings, practices and exchanges between subjects. And language became a locus where social, historical and individual processes were constructed.

The main saussurean topic is the study of the sign, specifically his distinction between the signifier (i. e. sound) and signified, understood as interrelated notions. On the question of the different currents developed in semiotic research is that these categories allowed the study of structural relations. That is, semiotic allowed considering a synchronic analysis of language as a system. But also semiotic opened the active function played by signifiers also allowed a diachronic study of language. In fact, the role played by the interrelation of signifiers in the production of meaning became one of the most significant outputs of Saussure's distinction, since it implied there was no other reference to meaning than other meaning. Therefore, 'the signifier cuts out or articulates the signified only by relations entered into with other signifiers: meaning is only produced by a systematic arrangement of differences' (Coward & Ellis, 1997, p.3). Semiology was an attempt to extend saussurean systems into new fields, such as scientific method.

However, the potentiality of these processes, in comparison with further developments on the rules of the saussurean networks and their structural dimensions was not assessed since subjects appear subjected to symbolic systems. According to Coward and Ellis (1997), post – structuralist authors like Barthes and Kristeva highlighted this kind of idealist presuppositions of structuralism as its main limitations. Even though structuralism and semiology were able to give an account about individual identities involved into material processes, they still kept pre – given essences along social determinisms and mechanistic tendencies. Since theory of action appeared then submitted into structural networks, post – structuralist authors opened up the possibility of thinking about subjects as processes. Foucault, Derrida, Lacan or Althusser offered alternative spaces for agency and critical questions (Coward & Ellis, 1997).

Gender Studies

Theories of performativity not only have influenced the development of the so - called third-wave feminism, but also the current theorizing of gender research in academia (Butler, 1993, 1999). Butler (1999) explores the performativity through gender and sexual identity. And the appearance of naturalness which accompanies heterosexual gender identity is simply the effect of repeated imitative performances. What is being imitated is a phantasmatic ideal of heterosexual identity. The main point in Butler's work is that there is no essence of heterosexual masculinity or femininity preceding the performance of these roles; we construct the ideal of that essence through our performances. And we construct it in the service of a regulatory heterosexual binarism. Gender, like other categories of knowledge, is the product not of truth but of power expressed through discourse.

If we turn, for example, to the political strategy proposed by Judith Butler (1999), we find some problems. And it deals with the political ambiguity of postmodernism. How it depends on the stability of that which it is a critical force. Oscillating between complicity and critique, Butler points out (1999, pp. 180):

The internal paradox of this foundationalism is that it presumes, fixes, and constrains the very 'subjects' that it hopes to represent and liberate. The task here is not to celebrate each and every new possibility qua possibility, but to redescribe those possibilities that already exist, but which exist within cultural domains designated as culturally unintelligible and impossible. If identities were no longer fixed as the premises of a political syllogism, and politics no longer understood as a set of practices derived from the alleged interests that belong to a set of ready – made subjects, a new configuration of politics would surely emerge from the ruins of the old.

In this sense, Butler (1999) proposes a strategy of gender parody, in which gender is self – consciously and parodically performed, in a masquerade which draws attention to the non – identity of gender and sexuality and to the multiple sexualities which can be written on our bodies. In this sense, this kind of new configuration of politics made Butlers' work to be considered as a post – feminism. In recent years it has been taken more seriously, as both a continuation and a critique of second – wave feminism. This current took as starting point the body as a social indicator. The body is a sign of things that are not working i. e. cases of obesity, hysteria. Empirically they translate social problems and they are the meeting point of feminism in response to authoritative discourses. In this sense, the body became an alternative source of knowledge.

Theorists like Rosi Braidotti (2002) and Donna Haraway (1991) develop other complex answers to this kind of postmodernist questions. It is a position which insists on the embodied and therefore sexually differentiated nature of the female subject. But embodiment does not mean essentialism, where essentialism is defined as implying a fixed essence to female identity beyond historical and cultural change. The embodied female subject is a nomadic subject, to use Braidotti's terminology. That is, she is the locus of multiple, complex, and potentially contradictory sets of experiences. However, Haraway goes further in the contemporary high – tech world. What both thinkers highlight is that female subject is embodied, that is, it cannot be separated from their lived experience. As Braidotti argues, our identities are not fixed but nomadic. And this kind of framework allows a new definition of objectivity (objectivity as partial, situated knowledge) and creates the possibility of new political coalitions.

However, the same political problem as in Butler's work reappear here as well. How to connect the theory to a political practice that requires mediation of the differences among women? In answer, both Braidotti and Haraway, offer political fictions Braidotti or foundational myths Haraway. That is how the well – known concept of cyborg is understood in Haraway or the nomadic subject by Braidotti. The idea is that these political fictions pretend being more effective than theoretical systems. The figure of the cyborg is a hybrid one which not only blurs the categories of human and machine, but also Western dualisms: self/Other, mind/body, nature/culture, male/female civilized/primitive, reality/appearance, whole/part, agent/resource, maker/made, active/passive, right/wrong, truth/illusion, total/partial,

God/man. Embodied but not unified, cyborg is a figure of blurred boundaries (Thornham, 2005). Cyborg became an instrument of researching gender, sexuality and identity. And it is considered as specific configurations of natures – cultures, as they are the re – invention of nature.

In this sense, representations of post – humanism may be understood like post–anthropocentrism. And they are dominant as an effect of technology which became self–adapted and self–implemented by machines. The question of the representation of the body in science turned into the question by which there is no body on science. The circulation of copies, the artificial reproductions makes the return of the copies and manufacturing. We had believed that one becomes but doesn't born. But now we don't know what does it mean to be born. Reproduction is not sexual but technologically mediated and redefine what is to be born and every step of the process. It implies a challenge for policies and social constructionism.

Cyborg manifesto says us, let's find a language by which we can address issues adequately and we can speak about them. A cyborg connects things that are not together, it is a figure of hybridity in between a logic of exclusion in our culture. It provokes our meaning making habits. We can not think the body without us. The body out of rational control is not possible. But technology is dissolving these conditions of possibility. Cyborg is constructed by coalitions from different movements that changes the terms of social contract. The social and political analysis of cyborgs give us a new antinomia since bodies don't fit in a symmetrical mode of power. There is a deficit in our representations where it is difficult to locate a post–humanist subject. A new question arises around this as how we do account of multiplicity.

The linguistic sign that is fundamental for post–structuralists is displaced by Deleuze into codes. He refers to systems of codification which are not written in Western languages but codified (Grosz, 2008). The genetic code is an example of the disintegration of human in post–humanism. The decodification of languages in order to express multiplicity. The body without organs refers to a corporeal skin, a mental mapping of what a body can do and later becomes organic. The body mapping as representation of ourselves refers to a functionalism connected on our representation of our bodies. The coded of the functionalism of body is clearly seen in biotechnology. Our culture has a code about the function of our bodies. We reduce the capacity of what our bodies can do by this codification. The body hasn't any organicist purpose. Specially women bodies are open treasures of multiple becomings.

In this sense, Annemarie Mol (1999) deeps inside this question about the multiple ontologies, i.e. through the case of study of the anemia. She studies the different performances of the anemia: clinical, statistical and pathophysiological. Even from statistical, the population is divided by children, men, women and pregnant women in order to set the haemoglobin levels. There seems to be meaningful the distinction between 'women' and 'men' at the haemoglobin level. However, from pathophysiology this kind of distinction is not pertinent, since 'it involves comparing an individual's Hb – values at a moment of possible deviance with those of the same person at a healthy moment. This provides individuals with a bodily history, a persistent physicality that is a part of their identity' (Mol, 1999: 82). If ontological politics suppose the

possibility of choice, then why it seems there is only an option and no possible choice? Even when these multiple ontologies are co-performing and inter-dependent. Even when we consider the relation between clinical and statistical seems to be also guide-lined by standards, as a part of their own practices. Therefore, question of choice returns to the idea of governance.

Actor – Network Theory

The performativity of gender is quite linked with the cultural studies of science and technology. The interrelation between entities that makes possible considering them as they are is one of the main assumptions of Actor –Network Theory (ANT). Moreover, performance is one of the key issues in ANT, since this is supposed to be an application of semiotics. Even, taking into account ANT implies considering performativity, since entities are performed in their own relations. As John Law (1999) considers, the relational materiality and the performativity are the mains characters of this theory. In fact, like Butler's theory, ANT supposes not only a linguistic theory but also an ontological review. Furthermore, ANT encounters the same problems of agency that Butler. This is a name, a term which embodies a tension. It is intentionally oxymoronic, a tension which lies between the centred actor on the one hand and the decentred network on the other. In one sense the word is thus a way of performing both an elision and a difference between what Anglophones distinguish by calling agency and structure. Annemarie Mol (1999) explores this kind of tension through the expression *Ontological politics*. In this sense, she dissolves the conditions of possibility where reality is being performed by active actions. In spite of the changing dynamics and the co-production of scripts that ANT provides, it should be possible to break through the traditional supposed building blocks. However, there are different co-existing realities and they should be also shaping different ontological policies. But it does not imply that ANT might become explicit implicit realities.

Building on ANT, Haraway (1991) concluded that passive objects become active. Scientific subjects, animals, machines and women form an unstable network of unrealized alliances between human and non – human actors. Networks of relations that create and stabilize objects. Where an actant is something that acts or to which activity is granted by others. They are not necessarily human actors, but anything provided it is granted to be the source of an action. As a non – human actor, however a cyborg cannot be merely reduced to an image; science and technology, indeed, are increasingly augmenting naturally occurring non – humans with artificial tones: nanomachines, robots, clones.

Considering stem cells boundaries is considering various scientific and clinical practices. One of the most controversial questions in biotechnology has been emerged around the policies, definitions and practices carried out on embryos, eggs, sperm... IVF clinical practices, stem cells research or nuclear transfer techniques constitute different contextual fields where these biomaterials are re-shaped. As mutable mobiles or objects that are reconfigured in the relation that keeps them visible. Where invisible work keeps objects and networks shaped and stable. Moving on an ontological choreography: how technical, scientific or political matters are coordinated around new technological practices. How things, practices and people are made

and remade. And agency turns a material semiotic attribute not locale in either human or non-humans, but a relational effect that is generated in different configurations of materials.

The practices involved in this interface have generated different contextual subjects and objects of knowledge where discourses constrain and enable what is meaningful. As Barad points out (2003, p. 821) 'discursive practices are ongoing intra – actions of the world through which local determinacy is enacted within the phenomena produced'. During the IVF – Stem Cells – Cloning controversies, embryos, eggs, sperm... are not an effect or cause but a part of agential intra-activities. They are not substances, essences, static entities or referents which receive passively meanings. Neither they are the product or the locus of discourses, policies, cultures, religions or history but ongoing intra-activity. Different kinds of regulatory practices enable or constrain their materialization, but they are not ending products.

Performativity in media analysis

The term *performativity* embodies a multitude of concepts in different research fields. This interdisciplinary character allows us articulating a more holistic model of media content analysis, where main theories of convergence are: a) Literacy-in-action (Leander and Lovvorn, 2006) is one of the most significant current notions in ANT. That refers to the involvement of news, texts, papers, documents, etc. in the construction and reframing of networks (Brandt and Clinton, 2002). Newspapers are considered as actors of innovation networks, since they highlight the translations that flows among the actors and the forms of knowledge they fix. 'To bring ANT into the discussion of journalism [...] offer a way to bridge ANT to longstanding theories of the relationship between discourse, professional practices, and political power (Turner, 2005, p. 322); b) Speech act theory (SAT) (Austin, 1955; Reiss, 1985; Searle, et. al, 1980). Leaving behind traditional theories in which sentences were the minimal unit of communication, the action dimension in language is included through the analysis of language performances in SAT i. e. apologizing, giving orders, thanking, etc. Thereby, speech acts became an useful tool in order to research how social processes are being represented, communicated and performed (Dow and Wood, 2006). Even speech acts will be considered as social agents; c) Gender and communication studies since an important issue that emerges from these findings is the relation among mass media and cultural inscriptions of gender (Dow and Wood, 2006). That is, how media discourses materialize bodies in performance meanwhile they are doing a political and social act. Introducing the performativity of gender implies returning the body to communication models, according to Bell and Bleuer (2006, p. 10):

a quick glance at almost any textbook in communication finds models drawn as not only de-gendered but disembodied: real people are replaced with boxes, arrows, circles and silhouettes. The messy, material body of any act of communication –its relationality, dynamics, historical and cultural embeddedness, and emergent quality – is refigured as absent. Performativity questions this figuration and demands attention to the body and its materiality: not as a site of biologically determined

conditions that cause certain effects and not as surface onto which culture writes gender. Both site and surface constructions of the material body foreclose questions of individual agency and the possibilities for cultural transformation.

The analysis of the philosophical discourses of science done by SAT, shows how the traditional agendas were focused on constative utterances. That means, scientists represented the world by locative acts, which denoted external entities and supposed to be a truth value (Beaugrande, 1998). However, the irruption of pragmatics in linguistics made possible considering another kind of possible units of communication, speech acts, depending their meaning on their own use. In spite of the benefits of this kind of approach, there are still some unsolved problems *i. e.* how to categorize speech acts if its interpretation depends on each context. Austin and Searle designed some possible taxonomy of speech acts. Searle elaborated a model of interactions between Speaker, Hearer and the World where intentionality was the foundation of speech acts: "What is required to move from intentional states to performing speech acts, according to Searle, is a means for making one's own intentions known to each others, and then applying this means for a further purpose. Each act is performed with a double purpose, a linguistic goal of deliberate expression of an intentional state, and an extralinguistic one of getting something else done by use of this expression" (Reiss, 1985: 25).

The distinction between the intended message and its goal rescues the Austin's (1955) distinction between illocutionary and perlocutionary acts. On one hand, illocutionary acts are conventionalized messages that are supposed to be taken up by the Hearer. If this occurs, then this uptake constitutes the perlocutionary effect on the Hearer. On the other hand, perlocutionary effects are not easily to predict because of they are usual to depend on Hearer's action -or Speaker's one if they are Commissives or Directives-. Perlocutionary acts consist on the effects that the illocutionary speech act obtained. In this sense, it is only possible to essay a taxonomy of illocutionary acts, since perlocutionary effects are not possible to predict. According to Searle, each illocutionary act is constituted by a propositional content and an illocutionary force or communicative intention. This illocutionary force is composed by: a) Essential condition: the linguistic aim of the Speaker; b) Sincerity condition: the psychological state of the Speaker; c) Direction of fit: the relation between Speaker's words and the world; d) Propositional condition: the propositional content. According to these conditions, there are different scenarios for illocutionary acts.

Table 1. Illocutionary acts (Searle, 1979; Reiss, 1985; Holtgraves, 2005)

	Essential Condition	Sincerity Condition	Direction of Fit	Propositions
A. Assertives	Commits Speaker to something being described	Speaker believes (x)	Speaker tries to get words to match the world	(x)
B. Declaratives	Successful performance guarantees correspondence or words to world. Commits the Speaker to trying to create this correspondence.	No psychological state expressed	Saying makes it so that world and words match	(x)
C. Commissives	Commits Speaker to some future course of action.	Speaker intends (to do Action)	Speaker tries to get the world to match his words	Speaker does Action in the future
D. Directives	Counts as an attempt by Speaker to get Hearer to do something	Speaker wants (Hearer do Action)	Speaker tries to get the world to match his words	Hearer does Action in the future
E. Expressives	Commits speaker to the expression of a psychological state	A psychological variable (attitude toward the Hearer)	World (psychological state) and words assumed to match	Speaker/hearer + Property

Spanish Context of IVF-Stem Cells-Cloning boundaries in 2006

In spite of the controversial character of the beginning of the *Human Genome Project* and the *Assisted Reproduction Act* passed by 1988, there was no public debate around the emergence of these technologies in Spain. In fact, the introduction of biotechnology in Spanish printed media was done under a neutral and non-critical point of view. Not only because of the lack of social actors in biotechnological news, but also because of the absence of editorials and opinion articles in newspapers. Moreover, scientific researchers were the main visible actors, what used to imply a neutral vision of these technologies. At the same time, the origins of assisted reproduction technologies in media representation supposed their reduction into a genetic engineering process where sexual choice and genetic manipulation were comparable concepts. In this sense, assisted reproduction technologies were also represented like a possible eugenicist technology when the first zygote phyla movements began to react against their

development (Adrover, Luján, Revuelta and Semir 2005). The kind of news production on these biotechnologies must be considered like a lineal process during the 1988–1993. Far from considering these researches like boundaries literacy configurations, media discourses seemed constative utterances or locutive acts. That is, news described biotechnological research as a given fact.

However, this kind of knowledge production was changing through the following years. The political instrumentalization of knowledge through diffusion models of communication, the incorporation of multiple knowledge producers, and the emergence of hybrid interactions among these different agents, made possible a different context of communicating biotechnology. Recent study of the public information in stem cell research, showed how scientific experts might change their role into Spanish media production during the 1997 – 2004 period (Adrover et al., 2005). One of its main conclusions was the introduction of a socio – political context into the stem cell debates. Moreover, this changing supposed the blurring of expert's arguments into a social epistemology. That means, scientific experts became also socio-political actors in stem cells debate. In this sense, the scientific magazines gave up being the sources of news production from the 60% by 2000 to the 25% by the 2001 – 2004 period. Even the cloning controversy during the 2003-2004 in Spain was managed by the opposition between conservative and religious actors against scientist and progressist politicians. The last one introduced the slogan therapeutic cloning / reproductive cloning in order to improve the first one. However, both sides of the controversy still managed traditional and patriarchal dichotomies like: reason / feelings, objectivity / subjectivity, truth / superstition. This kind of frame was a constraint for gender perspective. Its involvement supposed a soft discourse of feelings beside the religious one.

The *Spanish Draft Bill of Biomedicine* was elaborated in order to regulate cellular and regenerative therapies. This was the first time the Parliament set how genetic analysis and researches in human biological materials, especially embryonic ones, have to meet the Spanish standard. Thereby, the main actors involved were: the *Ethical Committees of Research*, which may guarantee the suitability of methodological, ethical and juridical characters of researches that imply interventions in human body or the use of human biological materials; the creation of the *Commission of Guarantees of Donation and Use of Human Cells and Tissues*, which belongs to the *Carlos III Health Institute* and it may evaluate the projects that require either obtaining or using tissues, embryonic stem cells or another human cells got by cellular reprogramming; the *Spanish Committee of Bioethics*, which sets the guidelines for the Ethical Committees, even the social and ethical implies of Medicine and Biology fields. Nowadays, the *Carlos III Health Institute* keeps the register of research projects and it has at its disposal the current information of the register of pre – embryos, oocytes and cellular lines of the IVF centers, the *National Register of Donors* and the *National Bank of Cellular Lines*. The last one is a network supported by *The Cellular Lines Bank of Andalucía*, the cellular bank of the *Center of*

Regenerative Medicine in Barcelona and the cellular bank of the Principe *Felipe Research Center* in Valencia.

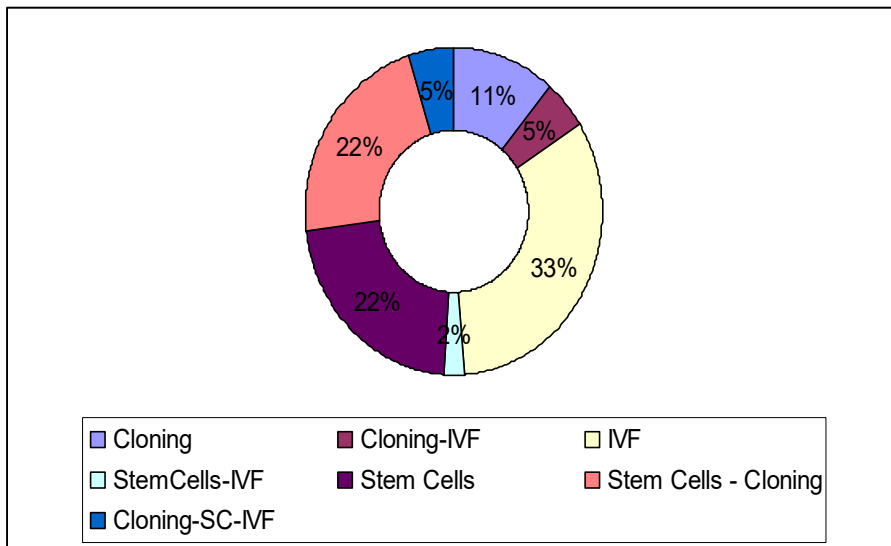
The *Spanish Draft Bill of Biomedicine* hardly spoke on women's health. But one of the poor references to it considered that if any research involves fertile women, then its possible adverse impacts on a later or unknown pregnancy must be taken into account (Title II, chapter 4, article 23.2).

Moreover, this Draft Bill forbids the creation of human pre – embryos and embryos for researching aims. However, it allowed to obtain human stem cells for research or therapeutic aims, even the oocytes activation by nuclear transfer, whenever it didn't imply the creation of human pre-embryos or embryos (Title IV, chapter 1, article 33.1, 33.2). There is contradiction in the use of language if we consider that we obtain a pre-embryo by the nuclear transfer. So one question that needs to be asked is why activated oocytes by nuclear transfer are not considered pre-embryos.

Media content analysis

In order to consider the spread of biotechnological discourses like a social and professional praxis, it has been introduced the performative approach as a framework of researching scientific communication. This kind of strategy is far from considering media discourses like constative utterances, which would only describe the biotechnological research as a given fact. Further on, the performative approach allows to introduce media discourses in a pragmatical context. A variety of methods have been developed and introduced to assess eggs as crossing biomaterials in IVF-Stem Cells-Cloning. Speech act theory was chosen because is one of the more practical ways of identifying the different scenarios and actors involved in media discourses. Specifically, it is the best approach to study the quotes used in media contents production i. e. which Speakers are chosen in these controversies, what kind of speeches they give. It was also considered that quantitative measures would usefully supplement and extend the qualitative analysis.

The initial sample consisted of 98 texts of which 25 did not refer to IVF, Stem Cells nor Cloning controversies. In an attempt to explore the crossing character of eggs as biomaterials involved in these technologies, it was considered during 2006 year since a new *Assisted Reproduction Act* was passed and the first *Draft Bill of Biomedicine* was launched in Spain. Selecting the texts was done by a key words search in electronic newspaper libraries of *El País* and *El Mundo*. These newspapers were chosen according to the *Spreading Justification Office*, since these are the two main national newspapers in Spain. The texts were coded by Nvivo 7, a qualitative analysis program, to set eggs dynamics through IVF, Stem Cells and Cloning news. However, data management and analysis was performed using SPSS 12.0. Once texts were coded, linked and marked, the process of model specification was carried out. Therefore, this set of analysis examined the visibility of eggs in IVF, Stem Cells and Cloning boundaries.

Figure 1. Eggs in IVF – Stem Cells – Cloning Boundaries (*El País, El Mundo, 2006*).

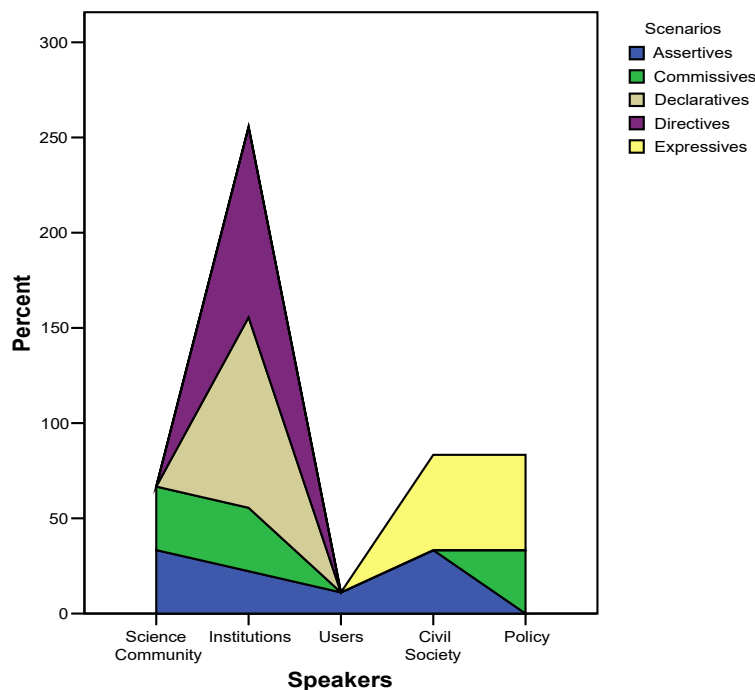
It can be seen from the data in Fig. 1 that embryos are not the only biomaterials which cross these controversies. There is an important difference among eggs representation in IVF (33%), Stem Cells (22%) and Cloning (11%) controversies. However, what it is interesting in this data is that two different main dynamics around eggs are assessed. While these biomaterials are highly represented in cloning boundaries, specifically with stem cells research (22%), they set sharp differences between IVF-Cloning (5%) and Stem Cells-IVF (2%) research. Therefore, if we analyze the visibility of eggs in assisted reproduction technologies, stem cells, and cloning, they enjoy good representation, especially in the first two.

However, by incorporating the analysis of eggs as "boundary objects" to the technologies mentioned above, we can see the invisibility of women's bodies in the cloning and stem cells debates. If we look at Figure 1, the eggs appear as "boundary objects" located between cloning and stem cells, but they can hardly be found when analyzing the texts of these technologies with those of assisted reproduction. The invisibility of the circulation of these biomaterials between assisted reproduction clinics and regenerative medicine research laboratories responds to what MacKenzie (2016) calls "strategic sacralizations". That is, how the purification of research lines in regenerative medicine allows exclusion mechanisms that decontextualize the role of female bodies in them. With the aim to replace the processes of reproduction with processes of regeneration, the risks that women assume when they donate their eggs or the special conditions they are offered during IVF treatments if they donate their surplus embryos to biomedical research on stem cells and nuclear transfer are made invisible. Hence, eggs are precisely a form of wasted vitality if donors do not decide to use them for research (Waldby, Cooper, 2014).

Speakers quoted in news were divided into five main groups based on their performance in media tendencies: science community, institutions, civil society, users and politicians. As

shown in figure 2, there is a correlation among the different kind of scenarios and speakers involved in these controversies. In contrast with other scenarios, assertives tend to frame all the different kinds of speakers. Since the broad use of assertives in speech act theory is equated to beliefs in statements which give a kind of information, social epistemology seems to be assessing these kinds of controversies. Similarly, declaratives scenarios, which classify and create facts by which Hearer should be conformed, are usual in science community, institutions and policy contexts.

Figure 2. Speakers and their Speech Acts scenarios (*El País, El Mundo, 2006*).

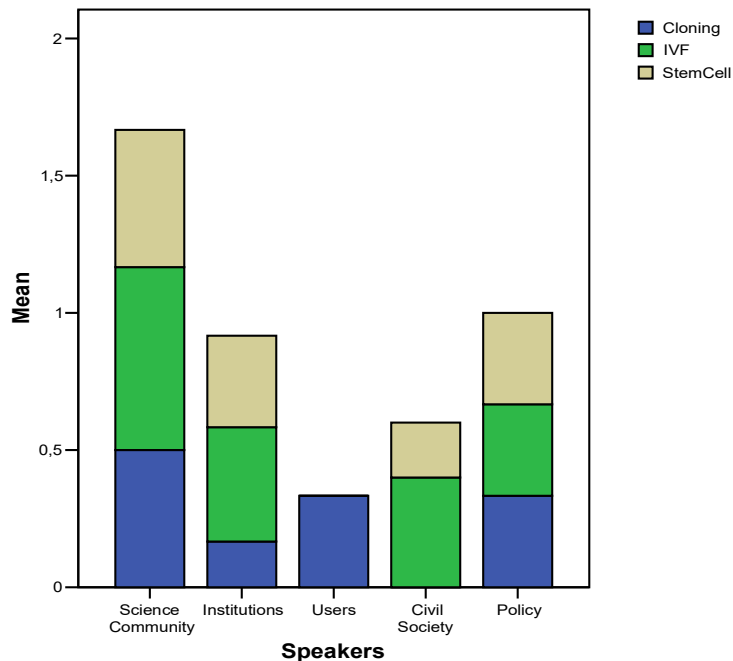


However, directives and declaratives generally take place only in scientific and institutional speech acts. Both imply a kind of action or performance and create expectations. While directives are usual to express desires through imperatives acts by which hearers are expected to do things; commissives plan actions which are supposed to be done by the speakers. A similar common pattern emerges in expressives, which tend to frame speech acts of users, civil society and politicians. That is, these kinds of speakers convey their feelings toward hearers, in order to stimulate and motivate them.

Thus, "science community and "institutions" combine all the "speech act possible" with the exception of the "expressives" that only appear articulated in "civil society and policy". What we want to highlight in figure 2 is how is how the voice of the users is in no way registered, which converges with the process of invisibility of women when put it in relation to figure 3. Therefore, reference is being made to potential users of the promises of immortality, perpetual health or longevity associated with the neoliberal imaginary of regenerative medicine research while making women's bodies, which are the source that makes said research possible, invisible.

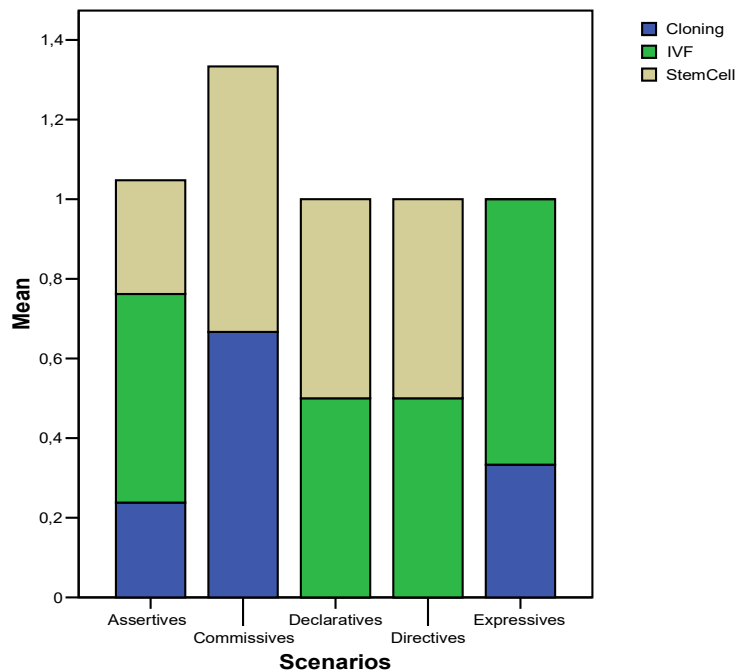
Data from this figure can be compared with the data in figure 3 which shows the visibility of speakers in these controversies. The most striking result to emerge from the data is that users, in this case potential users, are only quoted in cloning controversies. This data deals with the neoliberal narratives associated to the promises of immortality, health and longevity.

Figure 3. Speakers in IVF – Stem Cells – Cloning boundaries (*El País, El Mundo, 2006*).



Finally, the correlation between the speech acts scenarios and the kind of controversy they frame is interesting since it shows how declaratives and directives are not involved in cloning controversy. In this sense, in figure 4 we can see how the only type of discourse not found in IVF is the "commissive", in which the "perlocutionary effect" falls precisely on the "speaker who does action in the future", thus excluding all the other dimensions of the speech acts described in table 1. At the same time, cloning becomes an expectation generated by the speaker in assertive and commissive speech acts. The kind of action expected by users is reinforced by proving that it is precisely only in "expressive" speech acts, that is, those in which the perlocutionary effect falls on the listener.

Figure 4. Scenarios of IVF – Stem Cells – Cloning boundaries.



CONCLUSION

This paper has explained the central importance of biomaterials as eggs in IVF, stem cells and cloning controversies. Even this kind of controversies and dynamics emerge around embryos, it is possible to improve alternative analysis of them. And these findings enhance our understanding of the (mis) representation of women in these sociodynamics. One of the most important changes that need to be made in IV – stem cells – cloning researches and policies is the articulation of a gender perspective through the interactions among multiple actants as pipettes, Petri dishes or chemicals. Therefore multiple, fluid and dynamic fragments proliferate through their niche markets, services and demands. Cell therapies, foetal treatments, donation of biomaterials, genetic selection are some of them. The crux of all this, is that rule, difference, denial, contradictions are still performed from institutions, practices and representations which seem apparently devoid of power relations, such as gender.

Separating women's bodies from the processes of stem cell research and cloning not only dissociates them from recognition in the biomedical intellectual property organization—despite making research possible through their tissue donations—, it also sacralizes regenerative expectations in chronic diseases and the contexts of vulnerability they live in. Thereby, exclusion mechanisms in which an apparent state of citizen security through the purchase of health insurance and the backing of certain promises for the future are generated and semiotically disconnected from the material conditions of risk in which they develop. The negotiations about which biomaterials could be used by stem cells research is one of the most popular biomedicine spaces of negotiation of subjectivities and identities.

Hence, the emergence of donor economies is based on the interactions among women's subjectivity, their reproductive biology, the social technologies that modulate this trajectory, and the regulatory environment that allows the mobilization of maternal populations as donors without making them visible (Waldby, Cooper, 2014). In the face of this, the narrative of the neoliberal nation-states is being promoted by the media, reinforcing the idea that responsibility for health and economic issues falls directly on citizens who, in turn, are deprived of their social security networks. And media content analysis provide spaces from which there should be a rethinking of the new codes and figures that could give an account of these molecular processes. This study will serve as a base for new metodological designs in women studies and media content research. In this sense, the study of discursive practices in media introduce a new performative understanding of the nature of scientific-technological agencies.

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