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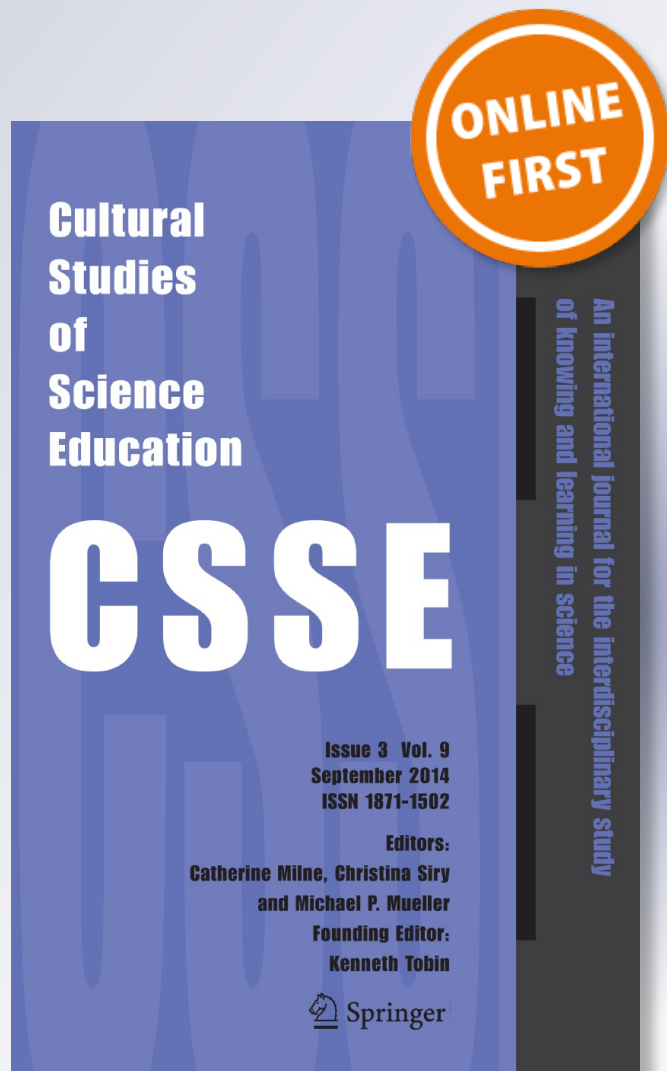
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The expositive discourse as pedagogical discourse: studying recontextualization in the production of a science museum exhibition

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Abstract In this paper I report on the sociological and educational particulars of The Biodiscovery Space exhibition of the Life Museum of the Oswaldo Cruz Foundation in Rio de Janeiro, Brazil, using Basil Bernstein's framework of pedagogic discourse and recontextualization. Data for analysis was obtained from interviews with the exhibition developers, field observations of museum visitors and analysis of exhibition documents. Using the ideas of power, classification and framework, among others, I analyzed the recontextualization process of the production of expositive discourse. Thus, working with Bernstein's idea of classification, I explain the relationship between the discourses of the science of biology, history of science, museology, education, and communication in order to produce an expositive discourse. I also make explicit how agents of the Official Recontextualization Field of the Museum and the Pedagogic Recontextualization Field "...of the Museum determine partly the final expositive discourse of an exhibition". Using the idea of a pedagogic discourse framework, I discuss how the constraints imposed by objects and texts in exhibitions help to create a specific manner of visitor interaction with these elements, "even if they have some autonomy". Considerations about the audience and the intended process of acquisition are presented, when I discuss the control strategies of the exhibition. I propose that the Biodiscovery Space exhibit has a visible pedagogy. Finally, using the collected data I discuss the power tensions created in the production of expositive discourse showing how distributive, recontextualization and evaluation rules work in the context of exhibitions. The study of the dynamics in forming the expositive discourse using Bernstein's framework reveals the individuals and institutions, the selection criteria, the negotiations and the power relations involved. It has the potential to assist both educators and researchers in the museum education field, as well as designers to understand the teaching and learning processes that occur during a visit and to establish relevant criteria to evaluate quality to best produce exhibitions in science museums.

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Resumo Neste artigo estudei as particularidades educacionais dos museus de ciências, na sua dimensão sociológica, a partir dos conceitos de discurso pedagógico e de recontextualização de Basil Bernstein. A exposição Espaço Biodescoberta do Museu da Vida, pertencente a Fundação Oswaldo Cruz, no Rio de Janeiro, Brasil, foi analisada com base em dados obtidos em entrevistas com os conceptores, em observações e análise de documentos da exposição. Utilizando as ideias de poder, classificação e enquadramento, analisei o processo de recontextualização na produção do discurso expositivo. Inicialmente, com base na ideia de classificação estudei a relação entre os discursos da ciência (biologia), da história da ciência, da museologia, da educação e da comunicação na perspectiva de produção de um discurso particular, chamado de discurso expositivo. Concluí que ele não pode ser identificado com nenhum desses outros discursos e identifiquei os agentes que compõem o Campo Recontextualizador Oficial dos museus e do Campo Recontextualizador Pedagógico dos museus, revelando como eles agem controlando parcialmente o discurso expositivo final da exposição. Em seguida, usando a ideia de enquadramento, revelei como os constrangimentos impostos pelos objetos e textos nas exposições ajudam a criar uma maneira específica de interação com esses elementos, mesmo que os visitantes possuam certa autonomia. Ainda apresentei considerações sobre o público e sobre as intenções relacionadas ao processo de aquisição, quando discuti as estratégias de controle da exposição promovidas pelo forte princípio de enquadramento. Essa discussão me levou a propor que o Espaço Biodescoberta possui uma pedagogia visível. Finalmente, usando os dados coletados, discuti como o poder opera a partir de regras na produção do discurso expositivo, mostrando como as regras distributivas, as regras recontextualizadoras e as regras de avaliação funcionam em contextos de exposições. O estudo da dinâmica de formação do discurso expositivo, a partir da teoria de Bernstein revela os indivíduos e instituições, os critérios de seleção, as negociações e as relações de poder envolvidas. Este tipo de estudo possui o potencial de apoiar educadores e pesquisadores no campo da educação em museus, assim como os designers na compreensão dos processos de ensino e aprendizagem que ocorrem durante a visita e em estabelecer critérios relevantes para avaliar a qualidade para uma melhor produção de exposições em museus de ciências.

Museums are secular institutions that date back to the sixteenth century. Over the centuries they have been redesigned in order to revise their role in view of society's social and cultural demands. According to Michel Van Præet (1989), from the fifteenth to the seventeenth century, there was an absolute identity between museum and exhibition. Specifically, during these periods a complete congruity can be observed between objects collected and those placed in an exhibition. The natural sciences at that time essentially intended to establish an exploratory inventory of the existing richness, with museum galleries being storage spaces of collected objects. Throughout the eighteenth century exhibitions began to incorporate new scientific concepts. Specifically, during this period the classification of scientific objects had as a major reference the work of Carl Linnaeus (1707–1778). The artistic and emotional presentations of the Natural History Cabinet of the previous centuries were replaced by the systematic and exhaustive alignment of specimens

in showcases, which eventually constituted what is known as a “classical type” of Natural History gallery (Van-Präet 1989, p. 27). At this time, there was still no separation between research and exhibition collections, and the “galleries-libraries” allowed practically all of the research-collections to be seen by visitors.

The Museums of Natural History of the nineteenth century are well known for the didactic focus of their exhibitions. During this period the dissociation between collection and exhibition was implemented, and later, the organization of thematic exhibitions. According to Van-Präet (1995), these exhibitions originated from the development of synthetic theories in various sciences, and in the case of natural science, an important factor was the publication of *The Origin of Species* by Charles Darwin in 1859. Thematic exhibitions that emerged at that time convey an earnest concern in designing a narrative designed to help understand the elements of an exhibit. Thus, reinforcing the educational role of museums.

In particular, from the nineteenth century and more intensely in the twentieth century, the educational aspects were emphasized as new generations of museums emerged, denoting a strong awareness of the public, its interests and the need for museums to assume teaching and learning functions (Hooper-Greenhill 1994). In recent years, exhibitions, have also undergone changes in that museums have assumed a noticeable aesthetic and educational concern, moving away from a perspective centered on the scientific organization of the collections—the scientific information—to a perspective centered on the needs and interests of the public (Fayard 1999).

Investigations on museums’ educational processes are still recent. It is research that questions the educational function of these settings and the perceptions that are created by their exhibits. Research on how to teach and learn in museums (e.g., Adams 2007) and on the educational potential of exhibitions are becoming increasingly common (e.g., Mortensen 2011). There is currently substantial research that promotes the production of knowledge in the field of education in museums, and many of our studies strive to characterize the teaching specificities of these centers in order to contribute to the analysis and improvement of the quality of such educational activities conducted in these spaces (Achiam and Marandino 2014).

The exhibition is the primary means by which the public comes into contact with the contents of a museum, with its collections and museographic techniques developed to make knowledge accessible to the visitors (Davallon 2010). According to David Dean (1994), museums have become multifaceted organizations with multiple purposes and the exhibitions are a key element of a museum’s identity. The preparation of exhibitions requires the involvement of multi-specialized teams in addition to the knowledge of theories, methodologies and practices, because it is through them that the museum “sells” the institution, informs the public, and seeks to change attitudes and behaviors, promoting possibilities for education and reflection. Producing an exhibition implies a translation process of the initial design, usually prepared in a textual form, via a curatorial project where the contents, the possible objects, the different resources, the desirable strategies that are intended to be presented, are listed. The curatorial project is then adapted into a spatial environment such as the exhibition. Thus, there is a transformation of *the logic of the discourse*—text, project—to a *logic of space*—the exhibition (Davallon 1999), with the intention of rendering the content clear and intelligible to the public.

Thus, exhibitions serve as the fundamental elements of the museums’ education and communication and are responsible for disseminating the knowledge accumulated in their collections and what is produced in their scientific research. In the words of John Durant (1996, p. 235), any exhibition is “necessarily an act of interpretation”, a narrative

production, and those responsible for producing them must have a particular view of the theme and must make it as equally relevant as the other exhibitions, which is a substantial responsibility to the producers of these media. The work of developing exhibitions requires making difficult decisions in terms of intellectual and ideological points of view, thereby addressing the question of, “what story is to be told” when elaborating a museum exhibition. Sharon Macdonald (1998) proposes that science exhibitions are not merely representations of uncontested facts because they always involve a cultural, social and political negotiation as well as value judgments, and they always have cultural, social and political implications.

Regarding the development of museum exhibitions, there is the process of selecting and adapting knowledge in order to make it accessible to the public (Simonneaux and Jacobi 1997). These selections promote knowledge changes, which are also determined by the specifics of space, time and objects in the museum (Marandino 2006). The museum’s knowledge procedures produce a discourse, herein called expositive discourse, composed of texts, exhibits, objects and technical devices, compiled to tell a particular narrative. This discourse can be seen as part of the pedagogical practice in museums and its procedure can be analyzed based on Basil Bernstein’s concepts of pedagogic discourse and recontextualization principle.

My characterization of museum pedagogy relies specifically on Bernstein’s concepts of pedagogic discourse and recontextualization. These two lenses provide me the necessary elements to understand the educational particularities of museums in their sociological dimension. Understanding expositive discourse as pedagogical discourse and examining its role can provide valuable information about the choices and also how the content and teaching strategies are implemented in museums, emphasizing the transformations by which scientific knowledge—considered here as instructional discourse—are conveyed.

The study of the dynamics in forming an expositive discourse reveals not only the individuals and institutions involved, but also the selection criteria, the tensions, negotiations, presence and absence of ideas and principles in the final discourse. Such information is essential to analyze the effectiveness of the exhibition to the public, in that it shows the conditions of producing the discourse and provides elements for better understanding it. Thus, the study of expositive discourse has the potential to assist both educators and researchers in the museum education field, as well as designers (Mortensen 2010) to understand the teaching and learning processes that occur during a visit and to establish relevant criteria to evaluate quality of exhibitions in museums.

The results presented here will offer at least two major contributions to the informal science education field. The first one refers to the importance in acknowledging museums as science teaching and learning spaces. The second one regards understanding the production and evaluation process of educational activities, including the production of exhibitions. It should be emphasized that understanding museums as educational places is not tangibly obvious. Although the educational perspective has been present since the beginning of these institutions, for a long period of time the role of safeguarding collections and scientific research were the main goals of these social sites (Valente 1995). It was mainly in the twentieth century that the relationship between museum and the public was taken on and expanded, leading to significant changes in these institutions, as mentioned earlier. Since then the educational role of museums has intensified, becoming, as in the case of science centers, one of its main functions. In these museums the exhibitions are prepared based on science teaching–learning research evidence, reinforcing the pedagogical nature of these places (Stuart 2000).

Looking for power relations in museum exhibition production: transforming exhibition into data

To analyze how power works in the production of the expositive discourse, I engaged in a qualitative research effort based on the work of Robert Bogdan and Sari Biklen (1994) specific to education and Judy Diamond (1999) who discusses the role of qualitative research as applied to museums. The goal of my research is to understand the production of expositive discourse as a pedagogical discourse in the perspective of those involved in preparing the exhibitions. From a methodological point of view, I want to understand the significance of this process through the perspective of people, events and situations that characterize the dynamics of elaborating exhibitions.

In this study, I used data collected by me in 2000. This data was added to a database of all data collected by members of my research group since 1995. The database was created so that data collected can always be revisited and submitted to new analysis. This database ensures authenticity and encourages multiple interpretations as new frameworks are used as lenses for analysis related to understanding how museum exhibitions are produced. In this paper, I used the data collected through interviews, observation and description of the exhibitions and document analysis in 2000, giving a new and a more profound analysis using the concepts of Basil Bernstein.

The original research that led to this work was a study of five natural science museums that had biology related themes. For this paper the data from one of those was chosen: the Biodiscovery Space exhibition of the Museum of Life. The Museum of Life was created in 1999 under the direction of the Oswaldo Cruz Foundation/FIOCRUZ, Brazil. This center is one of the most important research institutions in the area of biology, health, and history of science, linked to Brazil's Ministry of Health and located in the city of Rio de Janeiro.

From its creation, The Biodiscovery Space exhibition has not gone through significant changes. Some material repairs have taken place but it is still has the same structure of nine interactive modules related to diversity of life on our planet, observation of animals from Brazilian fauna, evolution, biological classification, cells, genetic and human diversity. My assumption is that all data from this exhibit, regardless of when collected, continues to have great potential to reveal how museum education is assumed and developed. The Biodiscovery Space exhibition is representative, not generalizable, of the issues involved in expositive discourse production and thus an example in understanding this process.

As to the data collection, the institution approved the research study and agreed to its name being divulged, and the interviewees consented to the use of their responses in the study, provided their names were kept anonymous. Six individuals responsible for the exhibition—here called conceptors—were interviewed during January and February of 2000, including five staff members and one Museum coordinator. Accordingly, all quotes in this paper are from that period. Their backgrounds include the areas of public health, history of science, psychology, history and biology, with the majority having experience in education as schoolteachers, museum guides and science communicators. In this text, they are identified by the acronyms LM1 who is the coordinator, and LM2, LM3, LM4, LM5 and LM6 to maintain their anonymity.

The interviews were conducted by myself and carried out with the coordinators and organizers of the exhibition selected, using a semi-structured script that sought to identify the actors involved, the content selected and the processes of selecting the expositive elements. The interviews were divided into two stages. The first one took place at an exhibition space, where I asked the respondent to address, in general terms, the purposes and contents of the exhibition. They were also asked to explain the reasons for some of the

choices related to the location and the presentation configuration of the existing objects and texts. In the second stage, specific questions were asked about the aspects mentioned, based on the script presented in Appendix 1. Audio and written recordings were made for both stages.

During three visits to the exhibition space I observed and noted the physical characteristics of the exhibitions that were created. These observations, to include museographic content, can be found in Appendix 2. I also photographed the exhibition, in order to reinforce the aspects described in Appendix 2.

Finally, document analysis was carried out with the few existing documents about the exhibitions. In this study there was access to the promotional materials of the Life Museum, such as folders and articles related to its implementation, and I used them to verify the information obtained by the other data collection instruments.

The first analysis was based on the criteria built, using as reference the principles of qualitative research, taking into account the specific literature consulted and the data obtained by the collection instruments (Diamond 1999). Thus, the data from the interviews, observations and documentations were initially organized into topics and then analyzed, with the research objectives as guidelines. The topics chosen were:

1. history of the institution;
2. approach and conception of the exhibition, in its scientific, educational and museological aspects;
3. selection, production and presentation of the subjects in the expositive space;
4. selections, presentation and reasons for the presence or absence of objects and texts, including aspects of their diagrammation, associated images and language structure;
5. construction process of the expositive discourse, by characterizing the teams involved, the professional formation of the participants and the role and purpose of each professional for the elaboration of the exhibition's elements.

Based on this initial analysis, the construction process of the exhibition, its conceptual proposal and the elements that comprise it, were characterized. My intention was to highlight the content and selection process and the ways to exhibit them, the reasons for the choices made, and the institutions and actors involved in the construction of the expositive discourse. For the second phase of data analysis, these items were organized in order to show the elements that constrain and regulate the production of the expositive discourse and to characterize the different discourses and their relationships, showing the principles of classification and framing in the production of the discourse exposure of the exhibition. Also, data were observed in order to show the power of the discourses and their relationship in the recontextualization process and to highlight the subjects and agencies that make up the recontextualizing field and its operation dynamics. Aspects related to the intentional acquisition process were also discussed based on the data collected.

Pedagogical discourse in the museum: the recontextualization and specialization of discourses in the production of the expositive discourse

Bernstein, a sociologist of education, analyzed the social structuring of pedagogic discourse and its transmission and acquisition forms in society. In his work, he is particularly interested in the relationship between class structures—with social inequalities—and the language of education (Forquin 1993). In over 50 years of research he explored, among other things, the relationship between macrostructural and microstructural dimensions of

society to understand the field of education (Sadovnik 1995). Accordingly, some of the concepts he developed help us understand how the pedagogical practice in its smallest unit—expressed in the relationship between acquirer, educator, and knowledge—is influenced by the social structures of production and the distribution of power in society.

According to Jean-Claude Forquin (1993), the work of Bernstein summarizes, to some degree, the proposal of the New Sociology of Education to the extent that it establishes a direct relationship between the distribution of power in a given society and the ways by which the society selects, classifies, distributes, transmits and evaluates the knowledge intended for teaching. In the words of Forquin (1993), this new sociological perspective intended to:

Bring out the complex system of relationships that may exist in contemporary societies, between the structure of knowledge and the operation mode of schooling transmittal, on the one hand, and on the other hand, the dominant forms of power and social control that are practiced both within the educational institutions as well as at the level of global society. (p. 85).

Bernstein in his work, as pointed out by Miriam Soares Leite (2007), although favoring “the pedagogical school relationships”, intended his conceptual language to describe any teaching relationship. From that perspective and understanding museums as educational spaces, I believe it is relevant to explore Bernstein’s conceptual framework to understand the discourse of the exhibitions, regarded here as units in which a museum’s pedagogical relationships are manifested. Schools are not the only social institution with educational functions. I believe that pedagogical discourse is not an element restricted to school and that spaces such as museums also include education among their main functions, which also produce discourses. Will the role of discourse prepared for the production of museum exhibitions be like the pedagogical discourse proposed by Bernstein? This aspect will be addressed through the discourse production analysis of a science museum exhibition.

Using Bernstein’s notion of power in the context of museums: the work of institutions and agents of the recontextualization process

The notion of power is crucial in Bernstein’s framework and it helps to understand how culture is disseminated along different social groups. Thus, I analyzed pedagogical text and prepared a pedagogical discourse study model that helps me understand pedagogical discourse has an internal order that determines the conditions of production, reproduction and transformation of culture. This order, according to Bernstein (1996), is related to the social basis of the distribution of power and the principles of control.

In his work, he proposed the concept of pedagogical dispositive as a theoretical tool that helps us understand the influence of the ideological principles of power distribution in a given society. In terms of the context of education, pedagogical dispositive controls the process of production, reproduction and transmission of the culture. It also regulates the power relations and the principles of control of the agents that produce and transmit the knowledge in an educational process.

Bernstein’s framework helps us to identify the institutions, the agents and their role in the production of pedagogical discourse. Analyzing many concrete examples, Bernstein identified the actors and institutions that participate distributing, regulating, recontextualizing and also creating a new pedagogical discourse within certain educational contexts. Thus, considering that museums are educational places, I wish to show how the

idea of power works in the context of museums, during the process of selecting how and who will control the production, the reproduction and the transformation of the discourse, identifying the institutions, the actors and contexts that are involved in that process. Addressing additional aspects of Bernstein's framework, such as the concepts of classification and framework, I will explain how the distribution of power defines institutions and creates agents in the museum context, producing the pedagogical discourse of the museum.

Bernstein's theoretical perspective (1996), distinguishes three basic contexts of educational systems. The primary context regards discourse production, the process whereby new ideas are selectively created and modified, creating the "intellectual area" of the educational system. The secondary context regards the selective reproduction of educational discourse and consists of several levels—pre-school/primary, secondary and third-level education and agencies, positions and practices. The third context proposed by Bernstein regards recontextualization, in which the positions, agents and practices address the movements of texts and practices of the primary context of discursive production for the secondary context, of the discursive reproduction. The role of those that belong to the third context is to regulate the circulation of texts between the two other contexts. Such agents and contexts form the recontextualization field.

This third context or the recontextualization field can be subdivided into two sections: the official recontextualizing field (ORF) and the pedagogic recontextualizing field (PRF) (Bernstein 1996). According to Bernstein, the official recontextualizing field comprises specialized departments of state and local education authorities, together with their research system. Sometimes the ORF also includes universities and their departments/sections of education with their research, researchers and teaching staff, depending on the role and the power that they have to influence the production of the pedagogic discourse. However, universities can also participate as members of the PRF, together with private foundations, teachers and other educators. PRF can include weekly newspapers, magazines, publishers, evaluators and consultants and can be extended to non-specialized fields of educational discourse, but which influence the State. In these terms, agents that are directly involved on the reproduction of the pedagogic discourse compose the PRF.

But how does it work in museum settings? Which agents and institutions preside over controlling and establishing the text that constitutes the expositive discourse in museums? Luciana Martins (2011) investigated the agencies involved in the production of educational museum activities of natural sciences, humanities and arts museums in Brazil. Her work emphasizes public and private institutions, government agencies and stakeholders that fund and regulate the educational practices of the museums. In general terms, Martins (2011) indicates that the official recontextualizing field of museums (*ORFmuseums*) is made up of different agencies from those that regulate formal education.

In Brazil, the Federal Government Ministry of Education and their state counterparts propose policies related to formal education however, policies related to museums, are governed by the Federal Government's Ministry of Culture, and to a lesser degree, by its state and municipality counterparts. A second governmental agency, the Ministry of Science and Technology of Brazil, develops public policies for museums, especially those related to natural sciences. Finally, the university participates at the ORF as well, mainly through its culture and extension agencies by providing funds to educational programs and defining the politics of museum education.

With regards to the agents that are directly related to *PRFmuseums*, Martins calls attention to an interesting aspect associated with the three museums she studied that some of the agents in the *ORFmuseums* were the same ones as in the *PRFmuseums*. This happens because educators of museums are the same individuals who research and publish in the

museum education field of knowledge and participate in defining policies for museums. Bernstein (1996) believes that situations such as those are exceptions and that this exception should be disclosed, given that most often the ones who created the official discourse are not the same ones who recontextualize it. Considering that the educators of museums are the PRF, but can also be the ORF, those professionals have a very high degree of autonomy in the production of the museum pedagogic discourse in the three types of museums studied by Martins (2011).

Martin's research (2011) provides examples of how the ORF and the PRF of museums operate and influence the activities of the educational sectors and their actors. Specifically, these examples explain how power works, defining the agencies that influence the selections of what can be promoted for museum education activities. In her work, one can perceive how the Brazilian's Ministries of Culture and Science and Technology and the universities, influence exhibition projects by giving or not giving financial support. Also, her research discusses how agents such as educators of a museum can make important decisions influencing and defining programs and sometimes policies of what can be improved and funded in the area of museum education.

I investigated the ORF and the PRF of the museum when an exhibition is produced because I consider that this element is the main educational unit of a museum. Specifically, I looked at the Museum of Life and the exhibition called Biodiscovery Space to perceive the institution's actors and power relations that control and promote the production of the expositive discourse. For this case, it was possible to reveal how power influences the public agencies by promoting and specializing a particular concept of museum developed in a public research institution with the role of disseminating knowledge to a large audience. We can also perceive how pedagogical agents work disputing power in order to construct a particular conception of exhibition, which has to respond not only to the institutional demands, but also to scientific, educational and communicational demands involved in its proposal.

To investigate how the *OFRmuseum* works in the production of the expositive discourse, I used interviews and documents to identify the subjects and institutions, characterizing how they act in the OFR field. Hierarchically, the Museum of Life is a research institution under Brazil's Ministry of Health, the Oswaldo Cruz Foundation/FIOCRUZ, and is linked to a research sector called the House of Science, which is dedicated to the study of the history of science and public health. The Museum was created with financial support obtained from a public selection program to promote interactive science museums of the Ministry of Science and Technology. Its origin took place in the midst of a broader cultural movement of creating museums in the country, using federal government funding for the construction of such institutions. Moreover, at the state level, the creation of this museum was part of a project that, along with other museums, intended to empower Rio de Janeiro to become an important cultural and tourist center in the field of science communication. As mentioned by Mauricio Arouca (2002, p. 269), Rio de Janeiro can be considered at, "both in national and international level, as a major center in the area of dissemination of science and technology. The institutions involved in science communication, alongside traditional Centres for Teaching and Research, located here, held in the last 3 years investments of R\$ 40 million."

Furthermore, because the Museum of Life has a historical patrimony heritage and promotes cultural activities, it is also influenced by the policy of official cultural agencies, such as Brazil's Ministry of Culture. As expressed in the objectives of the institution expressed in its website:

As it is linked to Oswaldo Cruz Foundation, the Museum has unique characteristics, reflecting the culture, the mission and the social compromise of the institution. Their central thematic are life as an object of knowledge, health as quality of life and man's intervention in life.

(<http://www.museudavida.fiocruz.br/cgi/cgilua.exe/sys/start.htm?sid=20>)

In the construction of the expositive discourse in the Biodiscovery Space exhibit, one can see not only the discourses involved in the production, reproduction and transformation of this final discourse, but also their overall relationship. Because Biodiscovery Space is an exhibition that belongs to the Oswaldo Cruz Foundation—FIOCRUZ, it is composed of, among other elements, the serotherapy laboratories from the early twentieth century. The history of this institution marks the beginning of systematic works in public health in the state of Rio de Janeiro, meeting the fundamental mission of adding meaning to the history of science in Brazil (Benchimol and Teixeira 1993). Besides the museum's commitment to expressing thematic related to health, life and memory of science, it has also the role of an important social and cultural instrument in Rio de Janeiro which is to disseminate research developed by the federal and state government, constituting of an educational and science communication axis in the country.

All of the elements presented in the history of the creation of Museum of Life allow us to identify Brazil's Ministries of Health, Science and Technology and Culture, and also the Secretary of Culture of the State of Rio de Janeiro through their health, protection, and funding policies, as some of the institutions that play a role in the official recontextualizing field of the museum (*ORFmuseum*) which creates their exhibitions, including the Biodiscovery Space. Those agencies funded the project and the performance of the museum and the Biodiscovery Space exhibition. Thus, it can be stated that those agencies—the *ORFmuseum*—can influence the thematic, the objects and all the elements that composed the expositive discourse, revealing how power works in the macrostructure of museum education.

But how does power work in a microstructure context? How do the professionals involved in the selection process of what and how is going to appear or not in an exhibition work? What determines the dynamics of their actions? With respect to the *PRFmuseum*, regarding the agents that directly participated in the expositive discourse production, it was possible to identify some of the individuals involved in the design and implementation of the Biodiscovery Space and the dynamics that embody its discourse. The profile of the individuals that comprised the production team—the conceptors—and the professionals hired for its implementation characterize the recontextualization agents of the exhibition studied. The team that was directly involved in the production of the exhibition comprises five professionals from different areas of knowledge, such as medicine, history of science, psychology and biology some of whom had experience as school teachers, museum guides and science communicators. Thus, their intellectual background was relevant to the study.

In the production process of the Biodiscovery Space, the contents and the current exhibition communication strategies were proposed by the team of conceptors and developed by architects, design technicians and programming and visual arts experts. These professionals designed the furniture, panels and interactive devices, as well as the hypertexts produced for the computers. In this process, the technicians followed the conceptors' expertise guidance to ensure the original proposal, which sought to promote an educational as well as an aesthetic experience for the visitors:

(...) took on the commitment to make a presentation of the history of this knowledge, and the other thing was to make this exhibition an interesting experience, presenting this content in an interesting manner (LM-2).

Regarding the dynamics in the production of the expositive discourse, the analysis of the Biodiscovery Space shows the dialogue—and the tensions—between the different professional perspectives in the construction of the expositive discourse. In fact, it presents strong evidence of how power plays an important role, defining which concepts and area of knowledge will be expressed, be absent or less represented, and which professionals will make decisions based on their degree of autonomy to determine how and what to display, creating boundaries between knowledge fields that can be seen at the final expositive discourse.

The Museum of Life has had, since its inception in its conceptual proposal, not only the intention to articulate the scientific and historical dimensions of biological knowledge but also the educational and communicative perspectives of science museums. Thus, in its constitution the relationship between different fields of knowledge was foreseen. Such interdisciplinarity can be observed in the Biodiscovery Space exhibition, which addresses biology themes and their history including aspects on biodiversity and the history of scientific research conducted by the institution. The exhibition originated prior to its construction in the Museum of Life, during the “Life” temporary exhibition in 1995 for the celebrations of Pasteur’s jubilee conducted by FIOCRUZ. This initial experience, distinguished by the intent to discuss aspects of scientific concepts of Life in its historic dimension, was very successful with the public and was taken as a thematic and museographic reference to prepare the Biodiscovery Space, which was built in the Oswaldo Cruz Foundation/FIOCRUZ in 1999.

The importance of FIOCRUZ as a research place in the health area was considered in this proposal because the museum is linked to the ‘House of Oswaldo Cruz’, the history of a science research center, and the exhibition seeks to present biology from a particular historical approach, as mentioned by one conceptor:

When we started thinking about the Museum, (...) the perspective of the history of science was a question also under discussion by the European, American Science Museums, etc. It is the idea of how to bring the view of science sociology into a museum experience, one that addressed the idea of including the moment when knowledge is embedded. With all the contradictions, with the notion that you have open rationalities competing, how science is done in practice and not as it is, rhetorically, after the activity is organized. (...) So, all of this division refers to some experiences, approaches, a critical view on the ethnographic perspective on ‘doing science’ and then try to understand how these experiences are built, working with networks between scientists and society (LM-1).

The 800 m² Biodiscovery Space exhibit is located in former stables, used in the early twentieth century for the manufacture of vaccines. This venue is a protected historic landmark as deemed by the Brazilian Historic Heritage Patrimony (see Fig 1). The exhibition consists of scientific objects, interactive modules and instruments, as well as games. For example, there are microscopes, vaccine vials, fossils and preserved and live animals.

The elements inside the museum are distributed throughout the space based on two main axes—“health” and “biodiversity”—that were chosen to establish a relationship with the institution’s history, but also for the current discussions on biology as a way to reach the public:

Fig. 1 The entrance of the Biodiscovery Space—a building protected by the Historic Heritage Patrimony



Why health in this backdrop theme? Because of the institution itself, where the museum is, which is a public health institution, and where we can use the different spaces of the foundation, from laboratories to public health schools working with health. (LM-3)

Biodiversity, at that time, was something that people were talking about, giving importance, valuing, discussing, ‘why biodiversity?’ So, that is how it was, a consensus thing of this group. But why biodiversity? Was to understand why people were speaking for or against it, defending it, or not regarding this biodiversity, this genetic material. Then we sought to provide information so that they could understand what is biodiversity. (LM-5)

As discerned by the conceptor’s response (LM-5), there are many demands that must be dealt with in the conception of an exhibition. For example, the institutional aspects, the perspective of a museum that communicates and promotes understanding of scientific ideas and the views of a multidisciplinary team, hence influencing how those conceptual ideas appear. The result was a thematic exhibition and from the central axes other themes were developed, including history of health, evolution, tectonic plates, cell theory, biological classification, human diversity, heredity and reproduction:

But anyway, I find it easier to work the educational issue through themes, you suggest themes, a theme is suggested and from these you can work the rest, if a unifying theme is proposed, and from there you can work other parts. I think it facilitates things, you integrate a thought, you can integrate content, daily life and also emotional, you obtain motivation quicker, perhaps, from the group that is being worked. (LM-3)

As I mentioned before, the decision of what to present or not is first influenced by the agencies that provide the financial support. Though, by defining conceptual axes and themes, selection of content and topics were performed by the conceptors, using criteria related to what they think is important to science museum displays, reveals how power works at that dimension. Considering the perspective of power is a good example of how boundaries of disciplines and areas of knowledge are constituted and how content may be presented in an expositive discourse, sometimes via a profound approach, and at other times as a list of scientific names, and finally, the content that is left out.

The existence of different disciplines in the constitution of the expositive discourse can be interpreted by the notion of power in Bernstein's framework. I identified some areas of knowledge not only in the intentional discourse but also in the exhibition itself, which can be analyzed as categories created by the power relation between them. As proposed by the author:

... the power relation creates, justifies and reproduces the limits between different categories of groups, gender, social class, race, different categories of discourse, a variety of agent categories. Consequently, power always acts to provoke disruptions, to produce marks in social spaces (Bernstein 1998, p. 37).

According to Bernstein, power establishes relations and forms of interactions between categories. In this case, considering disciplines as categories, it is possible to identify them at the expositive discourse level creating the narrative of the exhibition and, at the same time, establishing a relation between each other in order to be expressed as a final discourse. The actors of the pedagogical recontextualization field worked defining "what" and "how" those categories—disciplines—will appear.

In the Figs. 2, 3, I present some elements of the exhibition that composed its narrative around the main axis of the exhibition—history of the health and biodiversity of organisms. Figure 2 shows a showcase of antique vaccine ampoules seeking to present the health topic of vaccination, and at the same time to explore the role and history of the Oswaldo Cruz Foundation. The choice of vaccination was related to the role of the institution and the option was to expose this role by using objects from the museum collection because one of the roles of the exhibition was to present aspects about the history of science related to health acknowledging the Foundation's role in vaccine production in Brazil.

Figure 3 shows an interactive panel about the diversity of human beings called "I'm unique". Bringing the biodiversity theme to the exhibition and, at the same time, promoting physical interaction with the audience, this device discusses the diversity and the uniqueness of human beings. A mirror in the middle of the panel allows the visitor to see his/her face mixed with others in the photos. Also, words like "biotype" and "individual" are shown in the panel. Here, the selection of content not only focused on a certain approach of biodiversity—human approach—but also took into account the possibility of physical interactivity with the public. These aspects are also roles of the exhibition designed to address educational and communicational concerns.

Looking at the above two examples reveals the specificity of content and ideas selected to discuss health and biodiversity themes. There are various reasons for the choice of vaccination and human diversity, some of them related to aspects of the disciplines or areas involved in the exhibition and others to museology, which is related to objects from collections and their display, and museography, which considers the communication process with the public and education as related to the learning process and the audience.

Thus, the elements related to the field of museology and museography can promote the restriction of possibilities related to the preservation of the heritage and also to the

Fig. 2 Details of some vaccine ampoules produced by Oswaldo Cruz Foundation at the exhibition



Fig. 3 The interactive panel called “I’m unique”

importance of communicating the contents to the public. This scenario provokes constraints in the final expositive discourse because it is possible to identify the selections of the content where some concepts are highlighted while others are just named or abandoned—as shown in both examples (see Figs. 2 and 3). Those restrictions are also mediated by the objects and furniture that are preserved by patrimony, as they could not be removed from the exhibition space.

The importance of the museography in that exhibition is something to be mentioned in the production of the expositive discourse of Biodiscovery Space. The interactive movement in museum exhibitions, which occurred especially in the second part of the twentieth century, influences the decision of how objects will be produced and exposed in the exhibition. The scientific museology proposed by authors such as Jorge Wagensberg (2000) highlights the importance of stimulating different levels of audience interactivity (hands on, minds on and hearts on) in exhibitions as a way to motivate, delight and

promote the understanding of scientific ideas. Those aspects were present in the production process of this exhibition in the choice of the objects from the collection and the development of interactive elements. The variety of objects and views of museography—more traditional or more interactive—promote other boundaries between conceptual fields that had to be negotiated to produce the final expositive discourse. The speech of one coordinator explains such tensions and choices:

It was not meant to be a ‘science center’ but it was not also a ‘traditional museum’. Many things were considered to make this exhibition with regards to saying what you’re dealing with. So that part of museology, the traditional museology, without being a traditional museum, or a science center (...), to discover our language, we are trying to find our language, I think that’s the point here. You have activities like a science center, the traditional thing, because it is a historical place and you have all these themes to be displayed. (LM-5)

The data presented made me realize that there were many potential ideas, concepts, and theories from various areas of knowledge to be exposed in order to guarantee the historical and epistemological conception of the Biodiscovery Space exhibition. However, the demands from communication and education areas to which museums need to be responsive today promotes other restrictions and selections to content and to the way content is presented in the exhibition narrative. This situation represents strong evidence of the recontextualization process and is a good example of how power works in the production of the exhibition, revealed by the specialization procedure of the discourses and the establishment of boundaries between areas of knowledge—health, biology, history, education, communication, museology—which are present, but also in conflict and in dispute. Those conflicts are also present between the agents involved in the production of the expositive discourse, as I will show.

From Bernstein’s (1996) perspective, the idea of power considers the internal dynamics in the production, distribution, reproduction and change of pedagogic discourse, referring to an arena of conflict, instead of denoting a set of stable relationships. Then, there is a real or potential source of conflict, which is the resistance and inertia between agents of the recontextualizing field—official and pedagogic. Using this tension as a filter in analyzing the evidence, I explain how the negotiation of proposals was developed and how some perspectives were chosen and others abandoned.

Such conflict can be observed through the words of the interviewees and the observation of the Biodiscovery Space exhibition itself as expositive resources were being elaborated. Technicians from different areas of communication and art were hired to implement the conceptual proposal of the exhibition and gradually the conflict of perspectives, the different particular approaches of each area unfolded. As expressed by a conceptor: “There was quite a big a fight with our designers, more to do with the visual part, where the texts with the more explanatory points are used.” (LM-2)

The adaptation of the contents originally proposed required a joint effort between the professionals who designed the proposal and those who carried it out. Therefore, the relationship between content and its presentation had to reach a common denominator. For example, within the team of conceptors—in this case the agents of the pedagogic recontextualizing field of the exhibition—there was the need to reach a common denominator regarding the experience of the public: on the one hand more educative and on the other, more aesthetic, as shown in the statement hereafter:

I think that if you talk to the team you will see that we have one thought in common, I think it has to be broadened, yes, but not all the time, I do not think it has to be educational all the time, I don't have this concern, I think it has to be at certain times. (LM-3)

These two perspectives of the exhibition—educative and aesthetic—led to the need for negotiations with the individuals of the team, as well as with the technicians hired to construct the exhibition revealing the dynamics of how the recontextualizing field functions in the museum. We can consider that the conceptors of the Biodiscovery Space exhibit have relative autonomy about the choices of what and how to expose because negotiations are always necessary. Thus, constraints related to space, patrimony and the conceptual proposal, as well as the negotiation with the technicians hired, influence and define the final expositive discourse.

Classification: specializing discourses in the production of a museum exhibition

Bernstein's framework analyzes the production of the pedagogical discourse in a movement that at the same time produces many different discourses and correlates them, studying how they interact and how those discourses are specialized in this process. The author refines the formation principle of the pedagogical discourse, indicating that it is a recontextualizing principle, which selectively appropriates, relocates, refocuses and relates to other discourses to constitute its own organization and its own classification. Thus, for the author the pedagogical discourse cannot be identified as any of the discourses it recontextualizes and I also suggest that many discourses are involved in the production of the pedagogical discourse. The identification of those discourses reveals a specialization process and, at the same time, a movement of correlating them, and that mechanisms works in a particular way:

The pedagogical discourse is a principle for appropriating other discourses and putting them in a special mutual relationship, for their selective transmittal and acquisition. Pedagogic discourse is therefore a principle that takes (displaces) a discourse from its practice and substantive context and replaces that discourse according to its own focusing principle and selective reorganization (Bernstein 1996, p. 259).

According to Bernstein (1996), pedagogic discourse is defined by a rule, which works embedding the discourse of competence—the instructional one—in a discourse of social order—the regulative discourse-, “in such a way that the latter always dominates the first” (p. 258). Thus, Bernstein states that instructional discourse is one that conveys expertise and its mutual relationship, and regulative discourse is one that creates order, relations and specialized identity.

According to Bernstein, the recontextualization process makes the recontextualized discourse to be different from the discourse itself and what changes in the *other* discourse will depend on the dominant principles of a given society. To explain how this recontextualization takes place, Bernstein uses secondary physics education as an example. He states that school physics is the result of recontextualization principles that made a selection and displaced it from the primary context of discourse production—composed by universities or equivalent agencies—to the secondary reproduction context of the discourse

which is in accord with the instructional theories related to the logic underpinning teaching and learning:

In this process, Physics undergoes a complex transformation: from an original discourse to a virtual/imaginary discourse. The rules of relationships, selection, sequencing and cadence (the expected acquisition speed of rules acquisition) cannot be derived from some internal logic to Physics, nor from the practices of those who produce Physics. The physics reproduction rules are social facts, not logical ones. (Bernstein 1996, p. 261)

The recontextualization process takes place by the principle of classification—which regards the relation between physics and other disciplines—and framework—in relation to sequencing and pace related to academic context. From this perspective, physics taught in school cannot be identified as the physics produced in scientific research; it goes through transformations and adaptations associated with the curriculum, of the school, and the teaching and learning process. These changes are necessary for knowledge acquisition to occur and characterize how the production of pedagogic discourse operates.

The ability to recognize different fields of knowledge participating in the composition of the exhibition expresses what Bernstein (1998, p. 38) designates as “separation of categories”—or discourses—with the identities defined. According to him, the relationship principle between categories, in this case discourses, is due to the degree of separation between the categories of the set under consideration. Thus, the *classification* principle defines different discourses that can be identified and separated, as a result of the specialization process in the pedagogic discourse production. Accordingly, the idea of classification helps us to identify the categories—disciplines or areas of knowledge—embodied in the exhibition discourse—and analyze the relation between them. According to Bernstein (1998, p. 38) we can distinguish between strong and weak classifications:

In the case of a strong classification, we will have a strong separation between categories. In the case of the strong classification, each category has its unique identity, their unique voice, their own specialized rules of internal relation. In the case of weak classification, we have few specialized discourses, few specialized identities, few specialized voices. However, the classifications, be strong or weak, always include power relations.

In order to understand how power works in the exhibition discourse of the Biodiscovery Space and analyze the relation between categories of areas of knowledge and disciplines, I used the concept of classification. The data obtained from this exhibition show the different knowledge, concepts and theoretical perspectives that comprise the instructional discourse. Although specialization of the discourses implement boundaries between those areas of knowledge that are involved in the production of the expositive discourse such as biology, history, education, communication and museology, those discourses in the recontextualization process had to fit the logic of the physical space during the production of the exhibition.

In this case from the beginning, the location where this exhibition was built was a mediating element of its design. Its architectural design had to take into account the requirements and restrictions of the modifications in order to preserve certain historical aspects of the former site:

Although it is a very large space, 800 square meters, it actually has (nor ever had any) no free area for mid-sized exhibitions. Because the buildings are historically

protected, the architecture/configuration was not edified thinking of these activities. One is faced with considerable constraint on how these protected buildings can be used, we have continuously had difficulties with this issue, since previous museum exhibitions (LM-1)

The exhibit design of this space has undergone a series of impositions related to its architecture, which determined its final facade but in the process somehow, such impositions were incorporated into the conceptual proposal of the exhibition, thereby becoming part of it. This fact highlights the relationship between the discourses concerning the biological knowledge and the history of science—as a discourse of competency—and those related to heritage preservation, education and communication. These production dynamics reveal the specialization among the different discourses involved.

Incorporating the architectural constraints, adapting the museum projects to a previously demarcated physical space with such impositions, and then organizing and preparing the exhibition was no easy task:

Some things that were not done were due to the physical space. We had to make some adjustments, comply with the fact that objects could not be nailed to the walls, hence not shown. Some adjustments turned out really nice, like the little windows on the ground look very interesting, and in my view other adjustments seem inadequate. In the last room, for example, it had to be a mini living room, but we had to respect the limits of the building and that was a problem. (LM-3)

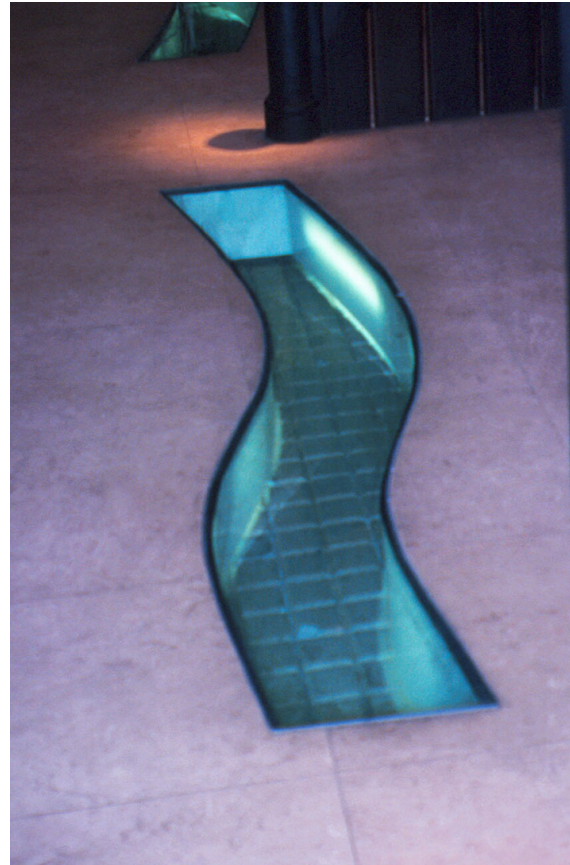
During the production of Biodiscovery Space exhibition, the discourse about the field of biology—considered here as instructional discourse—establishes relationships with other discourses. The ideas related to the concepts, such as biodiversity, origin of life, evolution, and also the history of vaccines, to be presented in the physical space and through texts and objects, are thus transformed. Each of those topics are represented and clearly seen at the exhibition, revealing their identity and voices.

The idea regarding all these sectors was that they would enable more thematic presentation spaces. But we weren't able to do this in order to keep these original stalls [wooden partitions where horses were put for venom inoculation and serum extraction], which decreased our ability to present the theme. Now, the hard part was to coordinate all of these things. We wanted to do more and show more, but when things have to be cut, it gets complicated. But these were the mediating elements. (LM-2)

A good example of architectural restrictions is in the choice of showing the antique floor of the stable where the Biodiscovery Space was constructed, by placing a glass above it, as shown in Fig. 4.

An important aspect that marked the relation between discourses in the elaboration of the exhibition refers to the impositions of its architectural design, with respect to the historical protection of the national heritage of the FIOCRUZ Foundation. Negotiations were held to reach a consensus on what could be changed or not and the construction of the exhibition had to take into account the physical structure of the site. Oftentimes the solution was to incorporate these architectural elements into the narrative of the exhibition, highlighting them or using them as part of the expositive structure itself, as observed in the figure illustrating the windows on the ground that show the old floor (see Fig 4). The specialization of the historical discourse is very evident, showing the voice of antique heritage at the exhibition.

Fig. 4 Preserved architectural details in the exhibition: windows on the ground to highlight the old floor



Furthermore, the educational perspective that inspires the proposal of the Biodiscovery Space exhibition can be identified as a specialized voice. The pedagogical proposal was consolidated during the preparation of the exhibition and also after it was completed, starting with the activities carried out with the public. The reference to the concept of “transversal themes” was also mentioned to better ground the exhibition’s pedagogical proposal:

That came together with something else that emerged from the group, which was that theme proposal. We did not know beforehand the proposal of transversal themes, this is a relatively new issue, we studied this because it was congruous with something we had been working on. (LM-3)

Here, classification mechanisms reveal another discourse that specializes and controls the production of the expositive discourse, the educational discourse. Knowledge from the educational field, specifically from the discussions that more broadly surround education called transversal themes, and also knowledge from science education, or learning centered on objects, and education in science museums via interactivity, define other discourses that are in the exhibition.

Considering museums as educational spaces and science exhibitions as a means to teach scientific ideas to different audiences, I suggest that the knowledge presented in these places is not in unison with that produced in the context of research. As pointed out by Jean Davallon (1988), in the preparation of exhibitions “There is a process of ‘representation’, of ‘figuration’ that coexists with the conveying of scientific discourse, (the source) to the discourse of popularization (the target)” (p. 5). Thus, the question is how does the

recontextualization process take place? How do the transformations and adaptations of knowledge and the pedagogic discourse production in museums take place? More than that, how does the classification principle define areas of knowledge and disciplines that participate in the expositive discourse?

It is possible to demonstrate the recontextualizing rule of action in the production of the expositive discourse, while the architectural elements, the educational principles, the strategies of communication by technologies are incorporated, shaping the conceptual proposal and also submitting and regulating them. The principle of classification is seen in the production of the exhibition discourse, giving voice to other discourses, rather than only to biology and history of science—the instructional ones. Museology discourses regarding historical preservation and concern with public communication and education emerge as legitimated discourses that regulate the discourse of science conforming the final expositive discourse.

Taking the above perspective into consideration, it can be affirmed that the recontextualization principle defines and separates the various discourses involved, using a strong classification principle. In this classification and specialization movement, discourses are created and refined. This new final discourse is constituted and is no longer identified as only biology discourse or as the history of science discourse. The transformation and production of this new discourse—the expositive discourse—can then be perceived, either by identifying the different discourses involved in this process, or by identifying contents and strategies that could motivate and assist the visitor's understanding and maintain and preserve the country's cultural and scientific patrimony.

Framing: the different forms of legitimate communication in an exhibition

The interaction between the different discourses in the production process of the expositive discourse produces a narrative that should be understood by the public. This expositive discourse, insofar as it is regulated by other discourses besides the biological and history of science discourses, defines the procedure in the exhibition space and determines how the texts and objects, and also the time spans, observation, reading and appreciation times will be presented. Those elements can be analyzed using another important concept of Bernstein's framework, known as *framing*. To the author, *framing*, controls the message being conveyed, selects and produces sequencing, and rhythm and establishes criteria that determine the knowledge to be taught (Bernstein 1998).

Framing, within this perspective, controls how the pedagogical practice is organized and presented by the agents that select the communication process and the control base of the transmission process. As Bernstein states:

When the framing is strong, the transmitter has the explicit control of the selection, the succession, the rhythm, the criteria and the base of the communication. When the framing is weak, the acquirer has more apparent control (I insist in 'apparent') over the communication and its social base (Bernstein 1998, p. 45)

Thus, framing refers to different forms of legitimate communication and, especially in the context of museums, it can be a tool to analyze the forms of communication that are selected for the exhibition and how much such selection controls what the audience is expected to do or not to do at the space. Is important to explain that, for the author, the values of framing—strong and weak—can be different for each topic of the practice. For

example, there can be a weak framing related to rhythm but a strong one related to other aspects of the pedagogical discourse.

In this study, I have chosen the text and the objects and the way they are displayed at the exhibition space as the empirical data that shows how framing works. The way those elements appear in the exhibition narrative defines the visitor's interaction possibilities during the tour in the space. However, it is necessary to emphasize that in this paper I used the concept of text to include both the idea of discourse, including all the elements presented at the exhibition including printed texts and objects, and its narratives, as presented in artifacts and texts, as elements of the expositive discourse.

As mentioned earlier, the exhibition is the primary means by which the public comes into contact with the contents of the museum, and it happens using many types of objects including those that came from collections to the technological exhibits and texts such as panels, labels, hypertexts, guide's explanations. Moreover, using empirical elements enables me to show how the regulatory mechanism works, submitting the instructional discourse to the regulative and social one.

The exhibition language controlling the expositive discourse

In his theory, Bernstein (1996) calls attention to the fact that in the recontextualization process there is the transformation of texts. The recontextualizing field—formed by the official and secondary agents involved in the production of the discourse—transforms the intertextuality of the text into intratextuality. By embedding the instructional discourse into the social discourse, the recontextualized discourse produces a specialization of the time, the text, or a metaphorical equivalent, the space and the conditions of the interrelationship. For example, pedagogical discourse provides a specialization in time and space; this discourse is linked to pedagogical practice to create its own markings and temporal divisions. Therefore, the way the text flows within a school context is determined by the specialization of time and space of that setting. Similarly, the way texts are produced and circulated at the exhibition context express a specialization.

The first observation is that the exhibition is not a book! In this setting, reading is determined by the spatial and temporal characteristics involved in a visit. To Daniel Jacobi (1998), it is the text that gives meaning to the exhibition, because this is what guides and directs the work to orient the visitor, especially in science exhibitions. Exhibits always use labels to identify the specimens and samples to assist the visitor in understanding the concepts and interpreting the models and reconstructions, or as notes to guide the use of an interactive device. Therefore, in the production of expositive texts, the recontextualizing rule is followed, adapting the instructional discourse to a type of text that has to be read in a specific manner—quickly, standing up and at eye level conforming to letter type, size and format (Gilmore and Sabine 1994). Here the framing activity can be characterized while producing a narrative with a specific manner of *what and how to see and read* at the exhibition.

In the case of the Biodiscovery Space exhibit, the production of the elements that comprise the texts in the exhibition reveal the choices, the challenges and moments of conflict between the different perspectives to define what content to address and what language to use. This fact can be seen during the production of the exhibition's texts and hypertexts, which point out the challenges in the translation of science to the public visiting the museum.

I explained a few things I wanted to put in the hypertext to the team and they said it was complicating the way it was being explained. Well, I have no experience with this; it was with great difficulty, sometimes over simplified and then changing the idea. (...) I had to consult books, many textbooks, to do something simpler, then I had to see the textbook together with a more specific book. (...) If this word is too complicated, it can't be substituted with another word, then I tried to change it. (LM-6)

The preparation of the various resources used in the exhibition, including texts, involved different choices. The criteria that guided these choices were many, but the importance given to the public, especially the school public, can be clearly seen in this process. The use of references looked up in textbooks to help implement the transformation process indicates the presence of knowledge from the school culture within the museum. In the preparation of the exhibition, the school discourse emerges as an important reference in the adaptation of scientific knowledge, especially if this public profile is the one that most often visits the museum. The following statement reinforces this fact.

Because at certain times, you begin to prepare a text and this text can seem very silly. Then another text was prepared, but another group would not read it. So then we decided again [taken by reference] from seventh grade to the second grade [of the school], in terms of testing the content, for [the student] to know more, talk about it more. (LM-5)

Challenges regarding the structure of the texts, not sounding “silly” to non-specialists, yet reaching the visitors of different levels of education, is part of the process. The concern with the exhibition language is well evidenced and, again, the public—through their prior knowledge and interests—also becomes an important element that mediates the production of texts at the exhibition. For example, a panel that talks about evolution has in its structure many open questions to enable the visitor to think about the themes exposed.

Choosing to offer open questions and relating the content of the text panel to the nearby objects at the showcase reveal an intended manner of reading, interacting and observing at the exhibition. Here framing works by implementing a particular way to visit and interact at this exhibition with the intent of having the visitor read the panel questions and try to answer them using the objects and other text as support.

On the one hand, the literature about the use of museums addresses the relative liberty of the audience when visiting those places to choose what to do, see, observe, not observe, and physically interact at museum exhibitions (Allard et al. 1995). Some authors underline the idea that the informal education that takes place in an exhibition has no rigid line or structure, it is spontaneous, explored and adapted to the interests of each person (García Blanco 1999). On the other hand, our data suggest that this liberty is partially controlled.

As shown by the intentions of the authors and by the texts they produce, the language and structure and the way the texts are organized at the exhibition promote some forms of reading and ways to acquire and interact with the knowledge espoused. The conceptors of the exhibition control the social base of the communication, selecting the language of the text, what is presented and how it can be read, characterizing a strong value of the framing related to time and space in the discourse. However, during the exhibition tour, the visitor can make choices about the reading rhythm, selecting the texts they want to read entirely or only briefly, or not at all, characterizing a weak framing related to rhythm. Those aspects express how framing controls the relation between who transmits and who

Fig. 5 Details of old microscopes from collection at the exhibition



acquires the knowledge, in other words, how the mechanism of communication control occurs within the pedagogical relations in the exhibition discourse.

The objects and the space regulating the way to observe, read and understand

The Biodiscovery Space exhibit, as a part of the Museum of Life, does not have a traditional research collection on natural science. Some of the objects used in the exhibition belong to other sectors of the FIOCRUZ Foundation, such as research laboratories or the historical collection from Oswaldo Cruz House, or objects donated by other institutions. Furthermore, most of them were produced to be used especially at the exhibition in order to compose the expositive narrative:

For example, some of the videos belongs to WWF and Spielberg allowed us to use part of the film for the Dinosaurs Park. The aquarium has species from the National Museum (...), and also from the Atlantic Forest, therefore we have many contributions. (LM-2)

There are many natural and scientific objects such as plant specimens and conserved animals, fossils and historical instruments in the exhibition (see Fig 5). In addition, there are many objects that are intended to disseminate and teach scientific contents as models, hands-on exhibits and games. There are also live animals, such as ants in an anthill, in the exhibition.

Sometimes we used some objects just as an element to be shown, as an epoch idea, as for instance those three epoch microscopes. It is never a thematic object, we don't use the historical value of the object, they are there as any other object. (LM-2)

The objects in the Biodiscovery Space exhibition do not represent a scientific perspective like that one might observe in collections. The objects are there to communicate concepts and ideas based on some thematic axis proposed by the exhibition. Their role is to illustrate, demonstrate and give examples of the contents. Indeed, especially in the case of historical objects, live animals, models, and fossils, they stimulate visitor behaviors, such as observation and contemplation.

However, there are other objects, such as hands-on ones including the “biodiversity game”, the preparation and observation of the organisms seen under the microscope, and the tridimensional cell model that the visitor can enter to see and touch models of cell organelles, that promote more active visitor behaviors.

Such variety of objects promotes different types of relations between public and object, and consequently, between content and visitor. In this sense, the work of framing the exhibition discourse is again identified in the type of objects used, and the way they are presented, that partially regulates the visitor’s tour and controls what and how to observe, touch, play and interact during the exhibition. As pointed out by one conceptor:

On the one hand it encourages to touch, to move, to learn, and on the other hand it requires that children have a more traditional exhibition idea, where they stand in front of the panel and have to take a look at the text, to understand it better. (LM-2)

Examples of exhibits that engender both hands-on and contemplative behavior include a station for the topic of cells where visitors can manipulate some microscopes and observe samples of cell organisms and a closed glass display case dedicated to the evolution theme, where fossil specimens are exposed for contemplation and are intended as evidence of the evolutionary phenomenon (see Fig. 6).

Other kinds of objects at the Biodiscovery Space exhibit emphasize the historical aspects of the building of the exhibition. As mentioned, the conceptors opted to highlight preserved architectural elements such as the horse stalls or stables, the old floors under the ground displayed through a transparent glass, the white tile walls, the ceiling tiles in view, among other elements. These are arranged in such a way so as to be observed by the public while also being preserved thus revealing the museographic strategies used in order to preserve historical patrimony, while embodying the exhibition as an object to be presented to the public. Thus, the organization of the objects can be seen, proposing ways in which the public should move in that space, highlighting what should be observed, manipulated, viewed or read.

The production of the exhibition and the final product highlight, with their educational and communicative roles, how certain types of objects, displayed in a specific way support the visitor to understand thematic elements and the contents. In that sense, we can see an interesting and complex recontextualization process of the museological object (Marandino 2012) from the collection or other social and cultural contexts to the exhibition. According to Martin Schärer (1999), in the *musealization process* the objects are decontextualized from their primary function integrated into collections, to be presented to the public.

The regulatory mechanism that underpins the instructional discourse and the logic of values grounded in the concern with the aesthetic elements, as well as the motivation and understanding of the exhibition by the public is evident in the composition of the exhibition space, revealing how framing works by arranging the elements in the space as a communication proposal. Each environment features a predominant color on the walls and panels, which helps the exhibition’s thematic organization and the public’s trajectory along the exhibition, thus serving as a support language for the visitor.

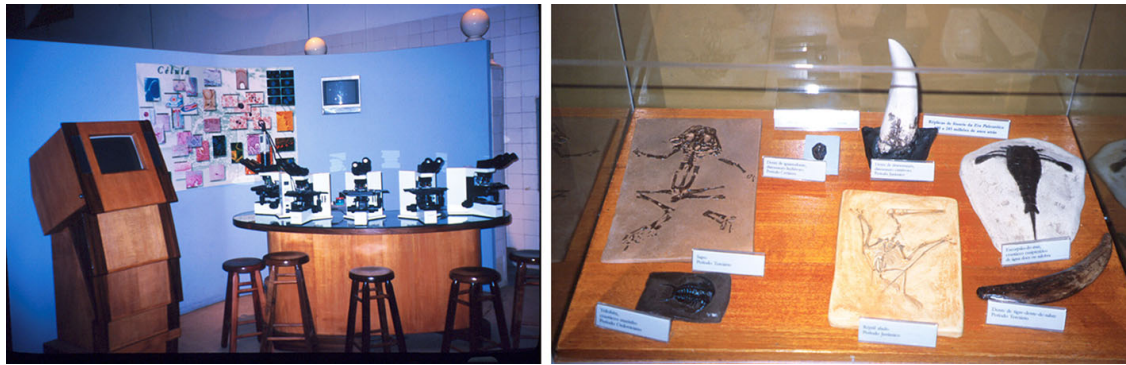


Fig. 6 Examples of the objects at the exhibition: contemplative and hands-on objects: first the cell station with microscopes to be manipulated by the visitor and second a showcase with fossils near the panel illustrating the “Evolution” theme



Fig. 7 A guided activity at the exhibition: the guide showing models of plants and promoting a discussion about vegetal reproduction

Also, the exhibition space is refrigerated and the specially designed lighting is dimmed, thereby creating its own setting, with special lighting focusing on some of the objects, assisting and guiding the visitor’s eye to dwell on them. The resources used in this exhibition were intended to promote the mediation between content and audience: images, colors, shapes, objects, space, as well as the details of the panel layout and the furniture design. The modules were intentionally designed or organized to draw the visitor’s attention to its aesthetic and didactic aspects, with the goal of promoting communication with the visitor.

The pedagogical agents of the transmission of the Biodiscovery Space were concerned with questions of ‘what’ and ‘how’ designed to assist the visitors to understand and behave at the exhibition. These conceptors worked determining the organization of the space, choosing which objects and texts should be presented and how they should be arranged throughout the course of the space. With such selections, they produce the rules of sequence and rhythms of behavior—of observation, reading and physically interacting in the exhibition with the goal of control. At the same time, they produce the criteria of the

message, in other words, the exhibition discourse itself, conveying a strong framing principle in that process.

The audience has the liberty of deciding what to do and how to behave in the exhibition spaces: people can stay as long as they want, or decide to stop and see or read only what calls their attention and move on quickly (García Blanco 1999) but as my data has shown, the transmitters of the discourse select the kinds of behavior they want to promote. In that sense, framing is in the hands of the transmitters but also partially in the hands of the public. The aforementioned aspects show how the expositive discourse works as a pedagogical discourse partially controlling, selecting, proposing sequences and promoting the teaching and learning process during a visit in this exhibition set.

The audience and the intended process of acquisition

As I mentioned earlier, the analysis of the production of texts displayed in the exhibition of the Biodiscovery Space reveals the use of textbooks as references, indicating a knowledge of the school culture within the museum. As stated by one of the conceptors, the text used in the panels and labels was written for youth aged eleven to sixteen, which in Brazil includes seventh grade of primary school to the secondary level. Textbooks were consulted in order to learn more about what kind of knowledge and what prior knowledge of scientific content was associated with the chosen audience:

What knowledge does he bring? And what kind of language can we use? It's not about using school education in the exhibition similar to the seventh grade content, so I'll insert this in the exhibitions. No, that's not it! But rather understand what seventh grade kids are doing. Talking about language: this is a concern we have, who are we talking to? And also knowing what content they should already know. (LM-5)

The criteria that guided the choices of “what” content were related to the axes of the exhibition while the text of the exhibit addressed the question of “how” the exhibit was to be presented. By reading the text and observing the topics that are developed around the objects in the Biodiscovery Space, it is possible to identify the importance given to the audience in this process, especially a school audience. One example of the audience preference at the exhibition is shown by the hypertext presented in a computer terminal about the diversity and identity of human beings. Using questions in the text to invite the audience to think about the thematic focus and using examples of genetic inheritance that are common in school textbooks—such as eye and hair color—are designed to communicate to the seventh grade and the secondary audience at the exhibit:

“Who do I look like?” (insert quotation at the text)

Text at the computer:

“Who do I look like?

[several images of individuals providing testimonials about their physical features, comparing themselves to family members]

Each human being is unique and has traits that were inherited from their families. Sometimes these traits are evident that they can be traced back through several generations. Other times these traits are hidden and are manifested many generations in the future. The features that make the children resemble their parents result from genetic combinations and form our genetic inheritance.

[in another screen, the Biological Identity subject, the visitor is asked if he can or not bend his tongue and using the YES or NO keys, a graphic appears with the information about the percentage of the population which can or not bend their tongue] [other screens address similar topics such as earlobes, hair and eye color and fingerprints]”

There are moments of the exhibition, which are controlled by guides working at stations, aiming at a sort of mediation with the public to promote the playful and cognitive dimension of the visit. As seen in Fig. 7, a guide is conducting an activity that shows anatomic models of vegetal organisms to the public in the part of the exhibition that addresses reproduction.

The conceptual proposal of the Biodiscovery Space exhibit promotes a kind of learning process, in which the visitor can choose to participate, or not, in those discussions. However, in these workshop activities, the guides control and promote this process. As stated by one conceptor, explaining the educational proposal of the exhibition:

It is a constructivist approach, each space [in the Museum of Life] was created to interpret this proposal, in the entire conception of the museum. We believe in this work, and it is closely related to the mediators, hence establishing a dialogue. (LM-3)

Bernstein (1998), discussing how framing works, explains that in general, when the framing is strong, a visible pedagogy is presented and, in that case, the rules of the instructional and the regulated discourse are explicit. On the other hand, when the framing is weak, there may be an invisible pedagogy, where the rules are implicit and the acquirer does not recognize most of them. In this case, how clear are the expositive discourse control mechanisms to the audience? Is this pedagogical practice at the expositive discourse visible or invisible at this exhibition under study?

Considering the control strategies promoted by strong framing through the text, objects and space in the expositive discourse, but also considering the many possibilities of the visitor to decide on what to do at the space, oriented by the elements in the exhibition, it is feasible to believe that the Biodiscovery Space exhibit has a visible pedagogy, which the public understands through the expositive marks, how they can behave and explore and what contents they are supposed to learn and understand. However, more studies have to be done to understand this fascinating process at museums.

Power operating by rules in the production of the expositive discourse

The exhibition that was the focus of this study is the result of the power relations established between disciplines, collections and ways to communicate and educate in a museum space. This relationship confirms the pedagogical dispositive—the expositive discourse—that controls the pedagogical communication through a group of rules identified by Basil Bernstein’s theories of distributive rules, recontextualization rules and evaluation rules which are hierarchically related (Bernstein 1996).

In general, the distribution of rules control who produces and reproduces the pedagogical text and who can innovate and create new meanings in the production process, separating and distributing the spaces and the agents of power. These rules regulate the relationships between social groups, forms of consciousness, and practice by distributing different forms of knowledge, controlling who may transmit what to whom, and under what circumstances.

In my data, it was possible to identify the main conceptors of the discourse, as they have the power to decide what will be maintained or changed in the final product. The group, formed by specialists in medicine, history of science, biology, psychology, education and science communication, control the selection of elements in the production process. They produce the legitimate text, choosing the language, the images, the objects, the courses and the times. As said before, they are part of the pedagogical recontextualizing field (PRF), as they participate in the expositive discourse production. In this process, the recontextualization rules act, controlling the transformation of the original speech, selecting it and placing it in a new context to relate with other new discourses, producing the pedagogical discourse. However, those agents only partially control production, because they are faced with some limits when seeking to impose their ideas, conceptions, opinions and desires. For example, many constraints imposed by the heritage preservation regulated what to depict and how to depict it. The strong classification principle of the disciplines show the negotiations and the selections that make the final expositive discourse appear as a multidisciplinary perspective of contents, which involves topics from biology, health and history of science.

Those recontextualization agents also decide what instructional conceptions will inspire the exhibition design and what the guides will undertake during the mediation process. The actors that produced the Biodiscovery Space exhibition have considerable autonomy in the official recontextualization field because they are not controlled by official mechanisms that impose regulations on what or how to elaborate in an exhibition. Even though the contemporary movement of science centers inspired them, as was stated by a conceptor (LM-5), they wanted to discover their own language that was a hybrid between a science center and a traditional museum. In that sense, the pedagogical perspective of constructivism inspired them in the preparation of the exhibits and the workshops developed by educators.

To Bernstein (1998), evaluation rules have a strong influence on the subject identifying them from cognitive, social and cultural perspectives. The strong framing value of the Biodiscovery Space exhibition using promotes certain manners of visiting, observing, reading and exploring the space. Furthermore, even though the audience included a wide range of individuals and groups, the conceptors privileged the school visitor.

One curious example of how expositive discourse legitimates a type of discourse—while not legitimating others—can be observed when conceptors address evolution in the panel at the exhibition.

It was once thought that every animal created by God was immutable. Would all of the animals that left Noah's Ark, after the deluge, be the same today? If so, how can the fossils of a wide variety of strange animals be explained?

This written text has the potential to motivate a public that is familiar with the theme of evolution, often considered complex and contrary to the beliefs of some religious groups.

However, while religious discourse is confronted with the discourse of science and the visitor is invited to reflect and observe the physical evidence of evolution in the exhibition, the importance of scientific knowledge in the expositive discourse is also reinforced. This example shows how the instructional discourse is adapted in the textualization of the exhibition, in that: (1) it confronts the religious discourse—used as an approximation and comprehension strategy with the public—and (2) is expressed as open and unanswered questions that promote the visitor's reflection and stimulates the observation of the objects in the exhibition.

The above example also shows an interesting aspect addressed by Bernstein (1999), when the relationship between horizontal and vertical discourse is discussed. The author who has common-sense knowledge, which is segmentally organized by culture and specialized activities and practices, understands horizontal discourse. With regards to vertical discourse, it “takes the form of a coherent, explicit, and systematically principled structure, hierarchically organized, as in the sciences” (Bernstein 1999, p. 159). Access to this last discourse is regulated in a given society by the power distribution that controls the circulation of such knowledge, its transmission and evaluation. “As part of the movement to make specialized knowledge more accessible to the younger public, segments of horizontal discourse are recontextualized and inserted into the contents of school subjects” (Bernstein 1999, p. 169). This occurs in order to facilitate access, among other goals. In my research, I identified the inclusion of religious discourse—the horizontal discourse of common sense—that has an educational function.

The scientific discourse in the text, the images of the panel and objects appear more strongly than the religious discourse, yet it is regulated by the discourse of education since parts of common sense knowledge—religion—are included in order to motivate and promote the public’s understanding of the idea of evolution. The linguistic and imagery structure of the panel—with the presence of a theme associated with common sense interests, the wording of questions, the presence of drawings of the ark of Noah and pictures of living beings demonstrating the diversity and transformation of the species—denotes the submission of the scientific discourse to the discourse of education, which regulates the production of the final text.

During the process that causes the scientific discourse to be regulated by the educational one, the legitimated content is revealed. In a science museum, the religious discourse can be called only a motivation strategy, but can never be assumed as a valid one. The scientific content about evolution, underlined by texts and material, found in the exhibition is such that it is socially and culturally relevant in the final expositive discourse. Furthermore, as evaluative rules that transmit criteria, the museography of the Biodiscovery Space exhibition assumes an educational role because it is based on instructional theories that intend to promote dialogue and knowledge construction by engendering a relationship between the audience and the content expressed by the objects and texts in a particular space and time. As pointed out, this evaluative rule of specialized time includes age and class, text and space underscoring the idea that this is a legitimate place to learn in the acquisition process.

Final considerations

The analysis of the expositive discourse production of the Biodiscovery Space exhibition using data obtained through interviews with its conceptors, observations and documentary analysis, revealed not only the dynamics of specialization of the discourses involved in this process, but also the relationship between the instructional discourse and the regulative discourse within the Life Museum of the Oswaldo Cruz Foundation in Rio de Janeiro, Brazil. Some of these discourses are instructional: the *discourse of biology and history of science*. Others refer to the regulative discourse, such as the *museological discourse*, considering the entire chain, from acquisition to conservation, documentation, preservation and extraversion of the collection, the *communication discourse* and the *educational discourse*, related to the explicit purpose of promoting the public’s understanding and learning of the scientific information provided in the exhibitions. In the expositive discourse, one can identify the

recontextualization of the intellectual field of natural science or “the what” according to Bernstein, and the social science fields of museological, communicational and pedagogical fields, which, according to Bernstein, is “the how”.

The elements brought here show how scientific discourse—the instructional discourse in Bernstein’s perspective—was not the only or more important discourse in the final discourse of the exhibition studied. It is embedded in the others that are involved in the exhibition production—the regulative ones related to the social order. The structure of the exhibition is not based on the logic that came only from the scientific field. Other kinds of knowledge participate in regulating this process.

It was also found that, like Bernstein’s pedagogical discourse, expositive discourse cannot be particularly identified with any of these other discourses. Data analysis reveals the existence of a specific discourse exhibition, which relates not only to its objectives, but also to the transformation of other discourses and knowledge from their own logic and principles, which are conditioned by aspects related to space, time, objects and other elements that make up the exhibition. Its peculiarities are evidenced based on strong framing principles. For example, in the forms of presenting texts and objects used in the exhibition space, featuring a particular narrative that determines a special and unique relationship between knowledge and public.

It can then be said that the expositive discourse has aspects that bring it closer to Bernstein’s concept of pedagogic discourse, because by not having their own discourse, conceptors shift to other discourses, including the discourse of competence—the scientific discourse—embedding them in the discourse of social order, regulative, values, from its own objective.

The movement around the visitors and the public currently taking place in the museums, especially since the twentieth century, result in education playing a key role in these spaces. This shows that the constituting dynamics of the expositive discourse is also the result of broader political and social movements, which in turn also have a historical dimension. When designing museum exhibits, and also when developing educational visits by school and non-school publics, it is essential to consider the particularities of the expositive discourse production and its articulation with other discourses, so that these actions may have the expected educational outcomes.

There is an increasing need for professionals working in museums, especially educators, to be trained to understand the characteristics of this discourse as a way to develop the educational aspect in those places. Especially important is an awareness of selection and discourse production mechanisms in museums, as well as the knowledge of the actors and agents involved, and the dynamics of the relationship between them which reveals the mechanisms of power distribution among the agents, institutions and fields of knowledge. This approach has the potential to demystify the way knowledge is taught and learned in these places. This expertise can assist both in the production of the most appropriate educational strategies by the educators and to improve the quality of how these spaces are used by the different publics that regularly visit museums.

Appendix 1: Annotated visit to the exhibition

Held before the interview in the exhibition space

- I would like that you present the exhibition, in a broad manner, indicating the themes, emphasizing the elements deemed important, commenting on its structure, on the

collection, on the circuit, on the public or any other information you deem to be relevant. During your presentation, I will ask questions, request clarification or make comments. After the visit, some of these topics may be revisited in the interview.

Guiding themes of the visit:

- Theme of the exhibition
- Museum project: how the proposal is being developed
- Origin, maintenance, care and safety of the collection
- Examples of situations experienced with the public
- Analysis of problems and suggestions proposed

Interview script to the conceptors and/or coordinators of exhibitions

Name of the Institution:

Name of Interviewee:

Occupation:

Education:

Date:

I) **Institutional association:**

- 1) What type of relationship do you have with the institution?
- 2) How did your involvement with the exhibition come about?
- 3) What was your role in the development stages of the exhibition?

II) **Elaboration of the exhibition:**

- 4) How was the exhibition elaborated?(team/staff, internal organization, deadlines, costs, etc.)
- 5) What is the exhibition about? What is its theme?
- 6) Why was this theme chosen?
- 7) What is the nature of the Museum's collection?
- 8) Was the Museum's collection considered to be the object of the exhibition?
 - a) If so, how? What was the patrimonial profile used?
 - b) If not, why?
- 9) How was the exhibition space chosen? What are the characteristics of this area/ space?
- 10) What kind of infrastructure was designed for the exhibition (furniture, support props, lighting, basic colors, etc.)?
- 11) How was the expositive discourse elaborated? What are the characteristics of the texts produced for the exhibition?

III) **Implementing the exhibition**

- 12) Were all the planning stages put into practice?
 - a) If so, how was it done? What were those stages?
 - b) If not, what were the stages that were not performed? Why did this happen?
- 13) Were support materials or catalogs produced for the exhibition? If so, for what purpose? For what public?
- 14) Was the exhibition disseminated?
 - a) If so, for what audience? For what purpose?
 - b) If not, why?

IV) **Analysis of the Conceptual Proposal**

- 15) What was the conceptual proposal of the exhibition?
- 16) How was this proposal elaborated?
- 17) Were previous studies conducted about the theme of the exhibition? What kind? Was there a bibliographic review? Were consultations carried out with experts?
- 18) How were the contents and concepts covered in the exhibition chosen? Why?
- 19) How is the relationship between the existing research on knowledge and its presentation in the exhibition?
- 20) Are there themes or current scientific concepts present in the exhibition? Why?
- 21) Were difficulties perceived in the presentation of some of the themes addressed in the exhibition? Why?
- 22) With regards to the museographic point of view, how you discern the relevance of the exhibition?
- 23) In your opinion, does the public understand the conceptual proposal of the exhibition? Why does this happen?
- V) **Assessment of the exhibition:**
- 24) Has the exhibition undergone some sort of assessment?
 - a) If so, what kind? With what objectives? Has some sort of reformulation been proposed?
 - b) If not, why?
- 20) What public visits more often the exhibition? Do you know why?
- 25) What, in your opinion, are the positives aspects, the strong elements of the exhibition? Why?
- 26) In what aspects do you consider it fragile? Why?
- 27) Would you propose some type of modification in the exhibition? Why?
- 28) In your opinion, does the public learn the concepts addressed in the exhibition? Why?

Appendix 2: Table of observation and recording of the exhibition

Institution

Title

Theme

I—Conceptual proposal (epistemological approach)

II—Thematic development (museological approach)

II.1—Objects Exposed

III—Museographic description: floor-plant

III.1—Expository space (general characteristics, security, climate control/environmental)

III.2—Expositive infrastructure (furniture, support, lighting, basic colors)

III.3—Language support (texts, labels, panels, illustrations, graphics and electronics)

III.4—Description of texts

IV—Catalogs/printed material

V—Supplementary resources

VI—Comments

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