

# Manifestations of Sexism in Science Classes as a Result of Humor as a Pedagogical Strategy

Manifestações de Sexismo em Aulas de Ciências em Decorrência do Humor Como Estratégia Pedagógica  
Manifestaciones de Sexismo en las Clases de Ciencias a Raíz del Humor Como Estrategia Pedagógica

Bárbara Elisa Santos Carvalho Luz  e Sylvania Sousa do Nascimento 

## Abstract

This article aims to understand how relations are constituted in the emergence of sexism in Elementary School Science classes through humor as a pedagogical strategy. The methodology consisted of a bricolage engendered by educational ethnography and discourse analysis elements. The ethnographic tools used were immersive observation, dense description and semi-structured interviews. An eighth-grade class was followed for ten months, and, in eighteen classes, the teacher used humor as a pedagogical strategy, reverberating in events marked by sexism. The dense description of these classes underwent a reading highlighted by principles of discourse analysis inspired by Foucault. It was observed that, once established in classes, sexism promotes a series of effects on subjects and power relations marked by sexual dimorphism, the rivalry between the feminine and masculine and the superiority of the masculine over the feminine. The conditions inherent to manifestations of sexism are linked to teaching action, and the effects produced on subjects are beyond the teacher's control and can cause, for example, embarrassment. In this way, the article contributes to the debate on the denaturalization of gender issues in the presence of humor as a pedagogical strategy in Science classes.

*Keywords:* Humor, Sexism, Gender, Teacher Training

## Resumo

O objetivo deste artigo é compreender como as relações de poder se constituem na emergência do sexismo em aulas de Ciências do Ensino Fundamental a partir do uso do humor como estratégia pedagógica. A metodologia consistiu em uma bricolagem engendrada por elementos da etnografia educacional e da análise de discurso. As ferramentas da etnografia utilizadas foram a observação imersiva, a descrição densa e a entrevista semiestruturada. Uma turma de oitavo ano foi acompanhada por dez meses e, em dezoito aulas, o/a docente lançou mão do humor como estratégia pedagógica reverberando em acontecimentos marcados pelo sexismo. A descrição densa dessas aulas passou por uma leitura frisada por princípios da análise do discurso de inspiração foucaultiana. Observou-se que, uma vez instaurado nas aulas, o sexismo promove uma série de afetações sobre os sujeitos e relações de poder marcadas pelo dimorfismo sexual, a rivalidade entre o feminino e masculino e a superioridade do masculino sobre o feminino. As condições inerentes a manifestações do sexismo estão atrelados à ação docente e os efeitos produzidos nos sujeitos escapam do controle do/ professor/a, podendo produzir, por exemplo, constrangimentos. Desse modo, o artigo contribui para o debate sobre a desnaturalização das questões de gênero na presença do humor como estratégia pedagógica em aulas de Ciências.

*Palavras-chave:* Humor, Sexismo, Gênero, Formação de Professores

## Resumen

La metodología consistió en un bricolaje engendrado por elementos de etnografía educativa y análisis del discurso. Las herramientas etnográficas utilizadas fueron la observación inmersiva, la descripción densa y las entrevistas semiestructuradas. Una clase de octavo grado fue seguida durante diez meses y, en dieciocho clases, la profesora utilizó el humor como estrategia pedagógica, repercutiendo en eventos marcados por el sexismo. La densa descripción de estas clases sufrió una lectura resaltada por principios de análisis del discurso inspirados en Foucault. Se observó que, una vez establecido en las clases, el sexismo promueve una serie de afectos sobre los sujetos y relaciones de poder marcadas por el dimorfismo sexual, la rivalidad entre lo femenino y lo masculino y la superioridad de lo masculino sobre lo femenino. Las condiciones inherentes a las manifestaciones de sexismo están ligadas a la acción docente y los efectos producidos en los sujetos escapan al control del docente y pueden producir, por ejemplo, vergüenza. De esta manera, el artículo contribuye al debate sobre la desnaturalización de las cuestiones de género ante la presencia del humor como estrategia pedagógica en las clases de Ciencias.

*Palabras clave:* Humor, Sexismo, Género, Formación de Profesores

## Introduction

In recent years, the literature in the field of Science Education has gradually addressed issues related to the thematic aspects of diversity, multiculturalism, interculturality, and educational policies (Schnorr & Pietrocola, 2022). It equally begins to discuss issues related to identities and differences that intersect with pedagogies centered on diversity and grounded in tolerance. For these perspectives, difference is seen as an emergent derivation from identities, while new discussions consider the interdependent relationship between identities and differences as outcomes “of a process of symbolic and discursive production” (Silva, 2000, p. 81). What we consider as social markers of Difference consist of a “field of study in the Social Sciences that attempts to explain how inequalities and hierarchies between people are socially constituted” (Marques, 2018, p. 14), with gender, class, and race being among the main ones (Moutinho, 2014).

In this context, we address gender identities and differences at the curriculum studies intersection (Paraíso & Caldeira, 2018) and Science teaching, considering discourse as a multidimensional event that produces effects and affects these sexuated bodies in interaction, leading to the need of new research questions. As indicated by Cassiani (2020), discussions that were previously silenced in schools and universities, such as racism, sexism, and homophobia, have been gaining prominence in the agenda of Science and Technology Education due to civil society’s struggles, prompting reflections on the idea of acquiring scientific knowledge as the sole objective in Science Education.

In this direction, Franco & Munford (2020, p. 4) signal an analytical movement in research to investigate the dimensions of the Science classroom “in terms of relating science learning, through the analysis of interactions, to different space-time dimensions that constitute the classroom. These same authors, in a non-systematic survey on gender issues, indicate a growth in this theme, highlighting gaps regarding the ways in which

the learning of scientific concepts is constituted by gender relations in everyday school life. Most of the publications analyzed by the authors start from the inequality between men and women in the Sciences and seek to understand the relationships between girls and boys with Science (Franco & Munford, 2023). According to Woodward (2000), one of the ways in which essentialist claims can underpin immutable identities is the naturalization of masculine and feminine identities based on biological truths, which can be reinforced in Science classes where sexism emerges. From a Foucauldian perspective, this article aims to contribute to the debate on the denaturalization of “cultural, social, and gender issues” in the presence of humor as a pedagogical strategy. We align ourselves with studies that address “multicultural and bilingual issues; ethnic issues; gender issues; comparative studies; diversity issues related to the teaching and learning of Science” (Tsai & Wen, 2005, p. 6. Our translation ).

Viana & Pastoriza (2020, p. 406) point out that “prejudiced and discriminatory movements regarding gender/gender identity or sexual orientation are associated with sexist principles, still present in today’s society, and therefore, in the school environment.” The same authors, in a CAPES’ journals publications analysis<sup>1</sup>, showed that in Brazil, Science teachers address the human body in its morphological, anatomical, and physiological aspects, but “they have difficulties discussing issues such as sexual orientation and gender identity in the classroom, both due to religious issues within the school community and concerns about how the students’ guardians will interpret the topic” (Viana & Pastoriza, 2020, p. 206).

The concept of gender is intrinsically related to feminist studies, pioneers in its problematization. Feminist theorization is commonly divided into three waves, in which the objects of work, research, and claims vary according to temporal implications. It is in the so-called “second wave” that, in addition to social and political concerns, feminism turned to theoretical constructions. In this context, the concept of gender was introduced, and discussions began about it, attempting to “reject a biological determinism implicit in the use of terms such as sex or sexual difference” (Scott, 2017, p. 72), referring then to the ways in which sexual characteristics are understood and represented (Louro, 1997). Thus, the problematization of the term gender by feminist studies aimed to “claim a certain field of definition, to insist on the inadequate character of existing theories in explaining persistent inequalities between women and men” (Scott, 1991, p. 19).

Understanding the place of relations between men and women in society, according to Louro (1997), is not precisely in the observation of their sexes, but in what has been socially constructed about each of them, and it is from this new perception that the concept of gender becomes fundamental. The author herself indicates, in fact, that the very process of developing this concept has brought about transformations in feminist studies in Brazil, where it only began to be used in the late 1980s. Joan Scott, an author who strongly challenges the male/female binary, rejects the fixed and permanent nature of binary opposition, and emphasizes the need for historicization and deconstruction of the terms of sexual difference (Scott, 1991).

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1 Coordination for the Improvement of Higher Education Personnel

Gender, for Scott, is a concept that consists of two interconnected parts, subject to distinct analyses. Essentially, for the author, gender is considered “a constitutive element of social relations based on perceived differences between the sexes,” linked to “a primary way of signifying power relations” (Scott, 1991, p. 21). On the other hand, for Judith Butler, an author who challenges the concept of gender on which feminist theories are based, “it has become impossible to separate the notion of ‘gender’ from the political and cultural intersections in which it is invariably produced and maintained” (Butler, 2012, p. 20). Butler problematizes the fact that gender is characterized as a part insertable into the biological body, hindering a cultural interpretation of sex.

In light of these perspectives, in this work, we adopt the concept of gender synthesized by Paraíso and Caldeira (2018, p. 13) as “an explanatory theory of the historical and cultural processes of constructing masculinity and femininity that, if it can divide, normalize, and hierarchize, it can also open gaps, embrace differences, and multiply possibilities of visible lives.” We also consider studies in which gender refers to the “social construction and history of sexes” (Louro, 1995) and the ways in which sexual characteristics populate our social practices and shape our processes of identification in the world. We consider gender identities, in their constant process of production, as “crossed by different discourses, symbols, representations, and practices; individuals construct themselves as masculine or feminine, arranging and rearranging their social positions, their dispositions, their ways of being and existing in the world” (Louro, 1997, p. 10).

In the context of Science Education, we emphasize that “reductionist approaches to sexuality in schools do not make this distinction between sex and gender, naturalizing social issues, imposing standards, and hindering the problematization of prejudices and respect for sexual diversity” (Freitas & Chaves, 2013, p. 146). Analyzing ten years of notices and guides from the National Textbook Program (2008–2017), from a post-critical standpoint, Cardoso (2018, p. 109) concludes that this public policy, due to its descriptive nature and emphasis on an untouchable and pure model of nature, operates biological, medical, hygienist, and heteronormative discourses, prioritizing the production of the binary of male and female subjects as an extension of the behaviors of certain non-human animals. Such discursive presence fills science classrooms with educational practices centered on disciplinary content in a non-critical manner, disregarding other epistemic relationships between nature, humans, non-humans, and self-awareness (Pagan, 2018).

We emphasize the need to problematize the concept of gender, in its constitutive form of social relations based on differences and the power relations historically experienced by individuals. In this sense, we approach the propositions of Michel Foucault, in which power “is not a substance or a quality, something one possesses or has; rather, it is a form of relation” (Castro, 2016, p. 326).

According to Foucault, power is considered “something that functions through discourse because discourse itself is an element in a strategic apparatus of power relations” (Foucault, 2003, p. 253). By power relations, we consider “modes of action that do not

act directly and immediately on others but on their actions” (Foucault, 1994, p. 236). Thus, in accordance with the Foucauldian perspective, power relations are classified here as “a set of actions that have as their object other possible actions, operate on a field of possibilities: induce, separate, facilitate, hinder, extend, limit, prevent” discourses and individuals (Castro, 2016, p. 327). According to Foucault (1994), sex is not the cause of sexual experiences but rather an effect, a normative aspect of power and knowledge relations that impose criteria of truth and regulate the subject in the world.

We emphasize that the connections between gender and sex are interpellated in relation to the knowledge and power dichotomy, which configures a heterogeneous network of connections, from which many discursive productions emerge, including relations of inequality and prejudice between genders. One of these productions, which we will focus on in this article, is sexism, in which “both women and men can be judged harshly, not taken seriously, or deprived of opportunities because they are women or because they are men” (Lips, 1993, p. 19). Sexism against the feminine can be considered a way of ensuring gender differences by prioritizing the masculine over the feminine, the binary of women and men, and heteronormativity. Attitudes devaluing the female sex are structured over the course of development (Ferreira, 2004) and also manifest in relationships established in classrooms.

Building upon this, we consider the teacher’s action essential since “it matters that pedagogical practice is a political practice, committed to creating spaces for transformation, subversion, interference, resistance, and refusal of fixed forms of manufacturing femininities and masculinities” (Freitas & Chaves, 2013, p. 131). Specifically in the field of Science Education, this issue began to be explored in the last decades with a focus on gender differences in scientific learning (e.g., Roychoudhury et al., 1995; Tindall & Hamil, 2004) and has recently expanded its research horizons. Themes such as sexuality and gender (Santos, 2020; Santos et al., 2018) and transgender and transsexual experiences in Biology education (Marín, 2018), gender markers in video lessons (Dantas & Pagan, 2023), are some examples of the emergence of the debate in the field.

The problematization of biological discourse in disciplinary educational practices (Marín, 2019), machism, and sexism involved in specific topics in the field such as the fertilization process (Santos & Heerdt, 2020) and steroid hormones (Swiech & Heerdt, 2019) are other examples of this theme entering the agenda of researchers in the field. A bibliographic review on the profile of research on gender and Science Education in Brazil, based on national journals in the field, indicates that, in addition to the content of Science with a gender perspective, it is necessary to analyze these classes from a feminist epistemology (Heerdt et al., 2018).

In this perspective, we bring again the aforementioned work by Franco & Munford (2023), which analyzed gender relations in the processes of conceptual learning in Science classrooms. Comparing pioneering studies on the subject with contemporary research, the authors indicate that, generally, in recent works “the distinctions between boys and

girls are understood from a sociocultural conception” (Franco & Munford, 2023, p. 3). The authors also state that “despite the advances generated by these researches, we still know little about how the learning of scientific concepts is constituted by gender relations in the everyday life of school science” (Franco & Munford, 2023, p. 4).

As signaled by Coelho & Campos (2015), the disconnection between sexuality and historical and cultural aspects in the way sexuality is addressed in Science education contributes “to the (re)production of heterosexism, homophobia, and excluding meanings related to gender” (Coelho & Campos, 2015, p. 899). In view of this, we indicate that in Science classes “it is essential to go beyond discussing curriculum content from a relationship between social, scientific, and technological aspects, but to relate them to a worldview that understands the existence of social inequalities and power asymmetries” (Oliveira & Queiroz, 2016b, p. 17).

One way to broaden a worldview is to identify and analyze power relations engendered in the context of these classes. Therefore, with the discussions presented here, we seek to look at things differently from what would not be possible with the old and comfortable lenses of the field of Science Education (Bujes, 2002), and thus contribute to the national scientific production on the subject.

The analyzed data consist of a subset of the corpus of a research in which we followed, described, and investigated ten months of classes in two groups of students in the final years of elementary school in two public schools in a Brazilian metropolitan region, and conducted interviews with individuals involved<sup>2</sup>. The focus of the research was to study how playfulness operates in Science classrooms.

However, in one of these investigated schools, we observed the recurrent use of humor as a pedagogical strategy by the teacher, from which, in some situations, we noticed the production of sexist remarks derived from the intended humorous discursive effect.

These events were excerpted from the original corpus of the research and are treated and discussed here. To this data excerpt, we posed the following question: “How do power relations operate in the manifestations of sexism in Science classes, where humor is used as a pedagogical strategy?” From this inquiry, we sought to analyze sexism in the context of Science classes, observing its movements, discursive productions, obstacles, and the possibility of emergence conditions, relating them to biological content objects.

## Methodological Pathways

The methodological pathways that allowed us to produce the information presented here consisted of bricolage methodology, a structure built based on the complexity of the analyzed situation and the questions of our investigation. This French-origin term, (*bricolage*), denotes the trial and error movement that constitutes

<sup>2</sup> A teacher and two students were interviewed during the fieldwork at this school. The age range of the students from lower-income backgrounds was 13 to 14 years old, and the teacher had been teaching the class since the beginning of the school year. The interview with the students is not the focus of the research presented here, only the interview with the teacher.

our immersion in the research field. It is an action on everyday objects that requires ingenuity and manual skills. The term bricolage, which originally “means a manual work done improvisationally and that uses different materials,” in the investigative field, indicates a way of researching that “rejects pre-existing guidelines and scripts, to create research processes as demands arise” (Neira & Lippi, 2012, p. 610).

Employing bricolage methodology implies selecting what serves our studies and helps us inform ourselves about our research object so that it is possible to chart a path and create conditions for something new to be produced. “Bricolage occurs with operations of cutting and pasting. We cut from ‘there’ — where methods, instruments, and procedures were invented and signified — and paste ‘here’ — into our research work” (Paraíso, 2012, p. 36). The bricolage developed in this investigation was built through cuts and pastes from educational ethnography and Foucauldian discourse analysis. Initially, we used some tools from educational ethnography as a means of generating information, and later, we relied on principles of Foucauldian-inspired discourse analysis as the basis for analyzing this information.

The tools of educational ethnography used were immersive observation, thick description, and semi-structured interviews. Over the course of ten months, we observed 18 Science classes of an eighth-grade group in a public municipal school in a city in the metropolitan region. We consider observation as a research source that “presupposes the involvement of the researcher in multiple actions, including recording, narrating, and situating everyday events with a precise intention” (Tura, 2003, p. 187). Immersive observation demands recording since actions witnessed in the field, if only stored in memory, could not be accessed for later analysis. The recording is done in narrative format, often accompanied by diagrams and subjective markers of observed events.

We complemented the fieldwork with thick description, in which “field notes are recorded, artifacts produced by members of the social group are collected and analyzed, and participants are interviewed about their interpretations of what is happening” (Green et al., 2005, p. 18). We conducted a thick description of the observed classes in a field notebook, in which the sequences of activities performed were recorded, making them available for later evaluations. An initial description was carried out during immersive observation and electronically recorded in a notebook. Thick description can be performed in layers that complement each other during immersion in the field. In Figure 1 below, we present an example of this tool that outlines a first descriptive level of the observed interactions.

Figure 1

Excerpt from the description of the classes in the electronic field notebook, with fictitious names preserving the identity of the interlocutors (speeches are indicated in italics)

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professor ao entrar na sala fala que só vai fechar a aula de ontem antes de fazer uma atividade com os alunos. A turma está agitada. Alguns alunos retornam à sala, pois haviam saído. El está sentado e três alunos estão na mesa conversando com el.. professor diz: *"Ow, a chamada aí oh"* e começa a fazer chamada. Presto atenção para tentar decorar os nomes que ainda não sei. Bruno está sentado na mesa d professor com a perna dobrada. professor acaba e pede para os alunos guardarem todo o material. Um aluno fala *"Vamos pra quadra?"*. professor orienta: *"Vocês vão pegar sua carteira sem arrastar e vamos fazer um círculo."* Ana diz: *"Ah eu já vi essa brincadeira"*. Eles começam a organizar a sala. Fico fora do círculo, pois professor fala que, para ficar no círculo tem que participar e eu quero só observar. El informa que eles vão passar no meio do círculo. Demora alguns minutos para os alunos conseguirem organizar a sala. professor diz *"Aqui, põe a pasta atrás da cadeira"*. professor organiza mais um pouco de modo a ficar um círculo realmente. Ele coloca uma carteira para fora da janela para abrir espaço na sala. Alguns alunos jogam bolsinhas e mochilas entre eles para organizar a sala. Agora eles começam a ficar mais calmos. Bruno ri e diz *"Vamos assar um frango hoje"*. professor fala: *"Ow, pode começar?"* El pede novamente para tirar a mochila da carteira. Então el diz: *"Nós vamos conhecer um ao outro aqui melhor. O jogo é assim oh..."* El chama a atenção dos alunos e continua: *"Eu tô em pé, mas eu vou sentar e pra eu sentar um de vocês tem que ficar em pé aqui"*. Um aluno diz *"professor o ano retrasado a gente já brincou disso"*. professor afirma: *"Eu vou falar uma característica aqui e se você tiver a mesma característica do colega você vai sentar aqui"*. A seguir el diz alto, em forma de comando: *"Troca de lugar em tem perna, rápido!"* Os alunos trocam e sobra Renata. Eles ficam agitados. El então orienta: *"A Renata teve sorte que eu tava só treinando tá. Agora é que vai valer."* Renata senta. Vitor fica interessado e diz impaciente .. professor: *"Então vai fala logo"*. Clara também parece animada pela forma como está posicionada na carteira.

Source: Author's notes.

In a second stage of analysis, the record from the thick description underwent a careful and detailed reading, guided by principles of Foucauldian-inspired discourse analysis. This type of analysis is a way of investigating discourse as a sociocultural event, which no longer considers it as a set of signs that conceals meanings and intentions but understands it as a practice. Foucauldian discourse analysis "does not unveil the universality of a meaning; it brings to light the game of rarefaction imposed with a fundamental power of assertion" (Foucault, 1996, p. 70). To analyze discourse from this perspective, it is necessary to "stay (or try to stay) simply at the level of the existence of words, of things said. This means that it is necessary to work hard with the discourse itself, allowing it to appear in its complexity what is particular to it" (Fischer, 2001, p. 198).



Analyzing discourse from this perspective is “to make contradictions disappear and reappear; it is to show the game they play; it is to manifest how it can express them, give them body, or lend them a fleeting appearance” (Foucault, 1997, p. 173). Considering that in the knowledge production process there are strategies, tactics, and articulations that leave their marks on the discourses themselves and are also modified by them, analyzing them from this perspective is to narrate this process of production and all these inherent articulations. Thus, to verify the information from the field, we employ principles of Foucauldian archaeology and genealogy. In archaeological principles, Foucault advocates the intimate relationship between the discursive and the non-discursive with the main objective of knowing a certain knowledge. This archaeology “questions the already said at the level of its existence” and “extracts events as if they were recorded in an archive” (Foucault, 2006, p. 257). The principles of archaeological analysis imply determining fields of possibilities and “sifting” layers of meanings that help us establish connections between the said and the unsaid. These many layers were analyzed at narrative levels that depart from the propositional framework, reorganized in archives.

The genealogical principles consist of investigating the possibilities for a certain object to happen. In Foucault’s studies, investigating only institutions, such as schools and prisons, was no longer enough for him. At this point in the analysis, it was necessary to pay attention to the details and the power relations constructed within them and by them. To carry out a discursive analysis with genealogical principles, we sought to infer, from the archives, the conditions and effects of the gender relations pointed out by Scott (1991). In the case analyzed, these relations are constituted in the discursive interactions that emerge from the teacher’s intentionality to address topics of the biology curriculum in a playful manner, using humor as a pedagogical strategy.

Thus, in the descriptions produced in the field notebook, we located and selected the classes in which sexism against gender was manifested. The descriptions of these classes were analyzed meticulously and patiently, in order to identify the statements present there. According to Foucault, an enunciation “is neither a proposition, nor a speech act, nor a psychological manifestation of some entity that is situated below or more within the speaker. The enunciation does not even need to be restricted to a verbalization subject to grammatical rules” (Veiga-Neto, 2003, p. 94). The enunciation is a heterogeneous discursive chain that defines directions for establishing meanings in discourse.

In our analysis, the enunciations, constituted of the speech, gestures, and images present in the classroom, were highlighted and characterized by discursive units that we drafted in the form of propositions. Such propositions are inscriptions to give discursive materiality to the events of the classroom and enable the analysis procedure (Vieira & Nascimento, 2009). It’s important to note that these propositions do not have temporal references to the observed classes; they are descriptive compositions of what was observed. Subsequently, regularities among these units enabled the identification

of archives, which consist of a set of relations from a given period and location that determine or condition “both what can be said — in terms of its contents, its limits, and its forms of manifestation — and everything that is worth remembering, preserving, and reactivating” (Veiga-Neto, 2003, p. 95). Thus, our data present organized descriptive propositions, which were later categorized into thematic archives (sexism). Figure 2 below exemplifies this stage of our analysis in which the propositions and subsequently the archives were identified.

**Figure 2**

*Excerpt from the analysis conducted from the dense description of the classes in a Foucauldian perspective*

| Propositions  | Archive(s)   |
|---|--|
| Teacher talks about the superiority of boys over girls in the history of playing this type of game and consistently encourages boys not to fall behind girls. | Gender demarcations in the teacher's speech encouraging rivalry between groups in an interactive activity. |
| Teacher reinforces rivalry between groups of boys and girls.  |  |
| Teacher suggests a round in the game where everything is at stake to try to help the boys win, but the girls do not accept.                                   |  |

Source: Author's data.

Another tool from educational ethnography used in our “bricolage methodology” was the semi-structured interview, understood here as the technique that involves two people in a “face-to-face” situation where one formulates questions and the other responds” (Gil, 2002, p. 115). We consider that, through the interview, it is possible to obtain data from the interviewee's point of view, and it can be characterized as informal, focused, partially structured, or structured. The interview, in our case, “is guided by a set of points of interest that the interviewer will explore throughout its course” (Gil, 2002, p. 117). The teacher, one male student, and one female student from the observed class were interviewed. The students were randomly selected from those authorized by their guardians and who accepted the invitation to be interviewed. This tool for collecting

information was treated in terms of the meanings produced among the interlocutors (Vieira & Nascimento, 2009) and also based on Foucauldian discourse analysis. The interview script consisted of 10 questions for the teacher about the organization of playful activities and 8 questions for the students about their perceptions of such activities.

Finally, based on the principles of Foucauldian genealogy, we consider that the archives derived from the descriptions of the classes and the material produced in the interviews are part of a power network established among the subjects in different contexts. Therefore, in this final layer of analysis, we focused on looking beyond the characteristics of each of these files, considering their existence conditions, their productions, their consequences, and the movements instigated within them in the context of the power relations that permeate them. Thus, our investigative questions aimed to understand how power relations are constituted in the emergence of sexism resulting from the use of humor in science classes in the final years of elementary school. Starting from this question, we sought to analyze sexism in a context of science classes by observing its movements, discursive productions, obstacles, and the conditions that enable its emergence, relating it to biological content objects.

## Results

In a total of 18 science classes recorded in this school, we observed the emergence of manifestations of playfulness in all of them, while the manifestations of recreation, celebration, and promotion of leisure were absent (author). From this corpus, we highlighted the manifestations of humor that occurred in 15 classes taught by a single teacher in the eighth grade. According to Lopes (2014), the manifestation of humor, as one of the indicators of playfulness, operates as a pedagogical strategy aimed at provoking laughter in the face of an unusual situation considered funny. Based on the dense description, a table with 245 propositions was created for analysis. In this school, from the analysis, we observed the emergence of sexism in fourteen of them. The analyses<sup>3</sup> of these classes indicated the presence of sixteen “propositions” describing manifestations of sexism, from which five files were described in Figure 3 below and subsequently problematized.

<sup>3</sup> In the presentation of the analyses, results, and discussions, all gender identifications of the teacher and students were blurred.

**Figure 3**

*Manifestations of sexism in the investigated Science classes and the respective disciplinary content worked on in the classes*

| <b>Sexism Manifestation (Archives)</b>  | <b>Disciplinary Content</b>                     |
|---|---|
| Gender demarcations in teacher's speech encouraging rivalry between groups in an interactive activity   | Cytology  |
| Encouragement by the teacher for competition and rivalry between male and female students in a game about cytology concepts                     | Cytology  |
| Different engagements between groups considered and divided by the teacher as the boys' group and the girls' group in an activity               | Human reproduction                              |
| Presence of machist ideas brought into the Science classroom by the teacher, normalizing and authorizing students' speech in the same direction | Human reproduction — Female reproductive system |
| Problematic aspects of machism in society   | Human reproduction — Pregnancy and childbirth   |

Source: Author's data.

From the analysis of the aforementioned classes, we apprehend that issues related to gender markers led to the emergence of sexism in almost half of the classes observed. This occurred at different moments and in different ways, established through specific statements and actions by the teacher, as well as by some students. This result allows us to affirm that one of the possibilities for the emergence of sexism in Science classes in the final years of Elementary School is the presence of social markers of gender difference in the speech and actions of teachers when dealing with content related to human reproduction and cytology. The humor strategy was used to address other topics such as homosexuality, the evaluation process, among others.

Among the social demarcations of gender difference there are, for example, statements and actions that attribute anatomical and behavioral characteristics inherent to sexual dimorphism between males and females. An example of this is the assertion that, due to the distribution of muscle tissues and secondary sexual characteristics, men are strong and women are delicate and fragile.

Another example is the stiffening of certain social behaviors into the sphere of genders in a binary view of masculine and feminine, such as the idea that women are organized, methodical, passive, and men are disorderly, competitive, and impetuous.

Thus, we observe that manifestations of sexism in Science classes can naturalize such types of associations between genders, creating a rule of superiority of biological aspects over historical and cultural ones. It is the case of associating the feminine gender with passivity/submission, and the masculine gender with activity/domination. Thus, we intuit that sexism, in this context, endorsed the inherent inflexibility of characteristics considered “natural” in a binary gender view that opposes the feminine to the masculine.

Our analyses also indicate that this rule produced from sexism in the observed Science classes fostered rivalry and competition. This occurred, for example, during the execution of a game about cytology content, for which the class was divided (according to the teacher’s own criteria) into two groups: girls versus boys. Throughout this activity, the teacher insinuated the superiority of the group called “boys” over the group called “girls.” During this activity, as we report in the excerpt<sup>4</sup> from the field notebook below,

The teacher said, *“I’ve been here for 25 years, and the women have never won.”* A student laughs. One of the girls says, *“We know what it is.”* *“I think the girls already know, be alert,”* he says to the boys. *“Did you guys get that you gave the sentence to them?”* Did the teacher said to the boys. The students shout. *“Boys, if they win, it’ll be the first time in their lives.”* Teacher: *“Speak softly, otherwise, they’ll hear and catch on.”* (Field notebook, 03/15/2018)

We also observed that the presence of sexism in science classes favored, in the classroom environment and in the students’ speech, conditions for the perpetuation of sexist ideas, in which superiority of the masculine over the feminine is demarcated. From some teacher’s remarks, the manifestation of expressions reinforcing hegemonic masculinity was normalized, thus authorizing its production by the students. This hegemonic masculinity can be understood as “a key connection between masculinity and heterosexuality in Western culture, with prestige given to boys with heterosexual partners and sexual learning” (Connell & Messerschmidt, 2013, p. 269).

It is important to highlight the teacher’s critical stance regarding hegemonic masculinity in episodes where sexism was present. For example, in one of the classes observed, it is said to the girls: “Girls, pay attention, most boys are machists” [Field notebook 06/25/2018]. Thus, despite presenting remarks and actions marked by machism, there is in the classroom discourse the problematization with the students of the machist nature of society and encouragement to discuss it, thus opening up a range of possibilities. In the same class, we observed an attempt to discuss the characteristics of machism and highlight its consequences by promoting a debate on the topic among the students.

A snippet from the description of this class is presented below, in which we outline a teacher’s mode of action. A video was initially shown to the students with the aim of introducing the topic. During the activity,

<sup>4</sup> The statements were transcribed as they were spoken. There was, therefore, no grammatical review.

the teacher says: This tape here was made by students, about 20, 25 years ago. The video shows teenagers talking about relationships. The students are very quiet, paying attention. The teacher pauses the video and asks them questions, saying: “Do girls want to hook up be with the boy?” One girl says: “It depends on where you are.” Another says: “I’m afraid of being talked about badly afterward.” The teacher asks the boys: “If a girl comes on to you, saying she’s interested, what would you think?” The boys laugh, and the girls say they would talk badly about them, and that this has already happened in the classroom. The teacher keeps asking if men tell their friends when they hook up with a girl. One student responds: “If the guy is a friend, we tell him. *Not the details.*” The teacher says: “*Guys, if you’re in love with the girl, would you want to know if she’s had sex and with whom?*” The teacher encourages discussion and counts how many boys say they would marry *a friend who their friend had sex with before. Most say they wouldn’t marry.* After counting, the teacher says: “*Girls, pay attention, most boys are machist*” (Field notebook, 06/25/2018).

The pedagogical practice of the observed teacher during that period was marked by the constant use of humor as a pedagogical strategy, presented in the form of conducting discourse through storytelling, jokes, and cases related to the content being taught. The type of humor used by the teacher was mostly jocular, characterized by the trivialization of complex situations and the naturalization of themes that could be addressed in a contentious manner. During some observed episodes, the teacher would make comments about students and teachers or mention something that referenced some of them in a form of “teasing.” Discourse can use emotions as means of persuasion and oppression, and these teases, according to Werneck (2015), are “a very peculiar form of humor, in which one makes a joke at another’s expense through a critique, real or not, made in a playful manner: it is, at the same time, a peaceful aggression and an aggressive caress.”

For the same author, “when someone is teased, what they do wrong, what’s wrong with them, what’s crooked, or strange is criticized” (Werneck, 2015, p. 188). In light of these actions by the teacher, the majority of students laughed, commented, and were interested in what the teacher said; however, this was not unanimous, as some resisted or showed discomfort in the context presented. The establishment of this type of discourse promoted a cycle of violent communication that is often little recognized by the interlocutors. An example of this kind of situation occurred when the differences between normal childbirth and cesarean section were addressed. When talking about the soft spots (fontanelles) of newborns, the teacher said, “I’m not sure about Juraci<sup>5</sup>, right? Poor mother!” and the students laughed a lot, but Juraci showed no reaction (Field notebook, 05/10/2018). In the reported case, the teacher highlighted an anatomical characteristic of a student that was considered deviant from a norm of normality and

5 All names used here are fictitious to preserve personal identification and to avoid gender markings.

deformity in relation to sex. Again, the effect of laughter tensed the classroom in an oppressive power relationship that can strengthen the non-recognition of differences in the classroom.

Thus, from the above-described results, we emphasize that the emergence of sexism in Science classes in the presence of jocular humor occurred through the teacher's discourse and, in this way, established three rules of power/knowledge: sexual dimorphism for the human species based on anatomical and behavioral characteristics; the rivalry between women and men, and male superiority. Both the relationships among the students themselves and between them and the teacher, in this case, indicated a tendency to highlight the superiority of the male sex over the female.

## Discussion and Conclusions

The investigation described represents a subset of data from a larger research project that investigated manifestations of playfulness in two classes from two schools in the final years of elementary education. The teachers followed were nominated by their peers for being recognized as unique in their playful educational practices. Sexism emerged, during manifestations of humor, as an effect of these interactions between subjects in episodes dealing with themes related to the curricular content of cytology and human reproduction. Methodologically, we approached sexism as a discursive event that establishes forms of judgments and truths about being and existing as women and men in the world. We showed that, in these classes, sexism manifested through the existence of social markers of gender difference, transcribed into five files organized from the teachers' speeches, with the establishment of three rules of power: sexual dimorphism, the rivalry between men and women, and the superiority of the masculine over the feminine. Such power relations do not establish themselves without movements of resistance and escape on the part of the interlocutors. These movements maintain a cohesion of the group that, for the most part, adheres to the strategy of humor. We know that science teachers often use various discursive resources such as images, analogies, metaphors, and also humor in their explanations to facilitate the learning of the content worked on and/or the discussion of sensitive topics in the classroom. However, we must emphasize that "these metaphors often reflect gender prejudices and stereotypes" (Souza, 2008, p. 155) as occurred, at times, in the investigated classes.

During the interview, it was stated by the teacher that they try to be funny, promote laughter in their classes with the intention of making the student feel closer to them, comfortable, so that they feel more at ease to learn. The teacher understands and defines themselves as someone who enjoys teaching in "a more enjoyable way. So the student feels comfortable approaching. Being able to ask a question, whether it's very good or not so much" (Teacher interview, 06/26/2018). For the teacher, "Education has to be done in this more cheerful way of dealing with the matter" (Teacher interview, 06/26/2018), and for this, they consider an affective approach to the student necessary,

which, for them, facilitates the teacher-student dialogue and improves their interaction (Teacher interview, 06/26/2018). It is important to remember that many gender-related topics emerge from discussions in the classroom about natural science curriculum content.

As indicated by Almeida et al. (2020), the observations reported here reinforce that “care is needed in the selection of examples and analogies used in explanations during Natural Sciences classes to avoid stereotypes and sexism” (Almeida et al., 2020, p. 9). Despite the teaching intentions signaled in the interview, we found that the discourse present in their pedagogical practice, in the analyzed classes, was marked by stereotypes that culminated in sexism towards the female gender. Among these stereotypes are the naturalization of a biological view and the reinforcement of heteronormative standards, for example, associating the female gender with weakness/fragility as well as the male gender with strength/virility. Similarly, the linking of the ability to overcome challenges and games solely to the male gender. This leads to sexism through the perception of superiority and dominance by individuals of the male gender and a binary view of sexuality. There is also the stereotype that boys are more undisciplined than girls and therefore require more attention from the teacher. As indicated by Graña (2008), in the classes examined here, “boys receive more attention because they present more disciplinary problems and less attention is given to girls because they are more discreet” (Graña, 2008, p. 80, our translation ).

In the same vein, we observed that the manifestation of humor once established in the science classes, in the presence of sexism, encouraged rivalry and competition between genders. We consider that, based on the three power relations constructed in this classroom, the teacher was placed in a position of reference for knowledge and as an example of behavior for the students. Conventionally, what is not allowed for students is also not practiced by the teacher. The use of jocular humor as a pedagogical strategy to navigate sensitive disciplinary content emerges in discursive situations to mask prejudiced and machist positions. Thus, it is essential for educators to perceive the potentially offensive and oppressive nature inherent in their discourses “because such an exercise can help in deconstructing pre-established concepts, intolerant manifestations, and discriminatory acts in the school environment, and thereby promote respect for the differences of each human being” (Viana & Pastoriza, 2020, p. 407). In the investigated classes, we perceived the influence of the teacher’s discourse on the students, as the sexism instigated by them provided the students with an idea of normalizing machist actions.

We emphasize that in power relations “there are also movements of return, which cause the strategies that coordinate power relations to produce new effects and advance over domains that, until then, were not concerned” (Foucault, 2000a, p. 240). We highlight the production of some of these return effects stemming from the presence of sexism in science classes, for example, when the teacher chose machism as a relevant topic for discussion. Despite the teacher’s discourse presenting characteristics



of machism, in some classroom discussions, the teacher pointed out the machist nature of society, acknowledged the differences among students, and promoted discussions about judgments among them.

The conflicting actions of this teacher prompt reflections on the discursive formation of educators. In Foucauldian studies, discursive formation consists of a set of statements subjected to the same regularity and approaches Marxist concepts of social formation and ideological formation. It is a discursive formation that, being immersed in the discontinuous and heterogeneous layers of statements, promotes the possibility of the emergence of certain discursive events and, in its dynamics, fosters conflicting upwellings of different ideologies.

By problematizing the formation of the teaching subject, authors point out the need for “an education that recognizes inequality based on the cultural construction of gender” and that incorporates “the analysis of diversity and differentiation in education and at each of its levels” (Tomé, 1999, p. 5). This author discusses the intersections in the teaching practice of gender discourses, with different normative and prescriptive powers that offer them different ways of perceiving oneself, perceiving others, and acting in the classroom. For him, not only gender discourses but also several others constitute the teacher’s worldview, and consequently, such a view naturalizes certain forms of pedagogical practice. Thus, the absence of problematizing gender markers in this teacher’s training limits them to a biological view of sexuality and the non-questioning of the oppressive power relationship with the use of jocular humor strategy.

Based on the results and discussions reached here, we consider the presence of sexism in teaching action as a reflection of patriarchy<sup>6</sup> as a structuring factor of society that leaves marks in all sectors. The teacher, as a subject in construction, is immersed in a patriarchal society, is formed in this context, and may reproduce, at times, its characteristics in speech and actions, as in the investigated case. However, we observed that the sexist points in the teacher’s speech were also able to open up possibilities in which they identified social issues of machism and other gender orientations and brought them for discussion in Science classes.

Thus, the emergence of sexism in the observed moments in the classroom, in its diversity of manifestations, can be opportunities for problematizing issues related to sexuality and gender, regardless of the didactic sequence. Therefore, we conclude that understanding them helps us promote learning beyond the disciplinary content, considering actions on ways of being and acting in the world.

As indicated by Rodriguez (1997) and more recently by Franco & Munford (2023), Science teachers, in general, tend to pay little attention to gender issues. Faced with some themes of the Science curriculum, the teacher is faced with two options:

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<sup>6</sup> We consider patriarchy as “a form of social organization in which relationships are governed by two basic principles: (1) women are hierarchically subordinate to men, and (2) the young are hierarchically subordinate to older men. The male supremacy dictated by the values of patriarchy attributed greater value to male activities at the expense of female activities; legitimized the control of female sexuality, bodies, and autonomy; and established sexual and social roles in which the male has advantages and prerogatives” (Narvaz and Koller, 2006, p. 50).

neglecting sociocultural aspects related to them or addressing such aspects. The choice to neglect some points like these may be related to political influences affecting the curriculum, as topics that were once naturalized are now controversial. Indeed, an example of this is the question of the spherical shape of the Earth, which in recent years has become a subject of popular debate influenced by “flat Earth” movements associated with political ideologies. On the other hand, the choice to address these sensitive topics in the classroom may be related to the teacher’s perception of the demand to engage with the socio-political and cultural contexts of the curriculum.

An important aspect to consider, based on the discussions presented here, is that manifestations of humor bring to the science classroom such sociocultural aspects inherent in biological content. However, it is impossible to predict or control its effects on each individual. Humor can capture students’ attention, as desired by the teacher in question, but it can also cause embarrassment and normalize rivalries and hierarchies between genders. Therefore, research is needed to address these new demands, which are constantly changing, and which teachers face in schools, especially in Science classes.

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 **Bárbara Elisa Santos Carvalho Luz**

Universidade Federal de Minas Gerais  
Belo Horizonte, Minas Gerais, Brasil  
baelisabio@gmail.com

 **Silvania Sousa do Nascimento**

Universidade Federal de Minas Gerais  
Belo Horizonte, Minas Gerais, Brasil  
silvania.nascimento@gmail.com

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Aline Andréia Nicolli

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