

## **Brazilian Pop Music as an inspiration for radio programs of science and technology**

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### **Abstract**

The role of music as an instrument for artistic expression of a culture and a society is undisputable. Since science and technology are being rapidly assimilated into the representation of modern societies, its appropriation through musical experience would only be natural. In this work, we analyze some characteristics of a radio show entitled “Rhythms of Science” (Ritmos da Ciência, in Portuguese), which explores Brazilian popular music (MPB) as the inspiration for texts on science and technology. Since 2009 “Rhythms of Science” is broadcast through a university radio station - UFMG Educativa (104,5FM) in Belo Horizonte, Brazil. It is also available on the internet

([www.ufmg.br/naondadavida](http://www.ufmg.br/naondadavida)). About five minutes-long, the program briefly evokes a specific song, relating the lyrics or part of it with a scientific subject. “Rhythms of Science” may trigger the curiosity and interest for science in a public that would not usually listen to conventional science shows. Here we explain the steps involved in the production process, including how inspiration is invited into the scene and how this is connected to the profiles of producers (mostly undergraduate students from biological sciences or humanities). Our analysis showed that the most frequent themes are zoology, botany and ecology but also included physiology, genetics, physics and astronomy. The link with culture, informality and informative content of the programs are suitable for their use in elementary and high school, the reason why they have been included in educational material for teachers to be used in Sciences and Biology classes.

## **Introduction**

The importance to communicate science is strongly enforced by parts of the academic community and society. Social scientists such as Boaventura de Sousa Santos (2005) believe that it is fundamental for democracy that scientific knowledge surpasses the walls of universities to be applied in society; otherwise, scientific research would be a waste.

In this sense, finding the best way to communicate science and technology is essential and any tool is welcome to help in this task. Music has the capacity to spread among people and the combination of music and science enables both of them to attain different publics and, consequently, more people. According to Moreira and Massarani (2006) the relationship between science and music comes from ancient times, being mentioned by Plato in *Timeu*, referring to musical harmony of the cosmos. This also inspired Kepler’s Astronomy studies, which became later Kepler’s laws of planetary motion. Another important information given by them is that music was considered a part of mathematics since the 16th century.

The article of Moreira e Massarani (2006), in which they expose their analyses on the presence of scientific themes in Brazilian Popular Music (MPB) was partly the inspiration to create, in 2009, the program “Rhythms of Science”, broadcast through UFMG Educativa, a university radio station in Belo Horizonte, Brazil. About five

minutes-long, the program briefly evokes a specific song, relating the lyrics or part of it with a scientific subject. The relationship is sometimes evident and at other times the words are a start point for bringing about curious facts about a theme.

Since its debut in Sept. 2009 until March 2014, 178 programs were concluded with themes including many Biology areas and other natural sciences fields such as Physics and Chemistry. In the present work, we analyze the frequency of science themes that appeared in the programs and tried to correlate it with the production process of among previous and present authors/producers of the program.

### **Methodology**

The analyses were based on two approaches. First, the themes of the programs were obtained from a list in which after completion of the program, the producer fills out a form indicating the main field of knowledge, related areas and keywords that best describe the program. A frequency chart was drawn from this table and the most frequent themes were listed. The strategy to understand how the inspiration is involved in the production process, i.e. selection of song or science theme, undergraduate students that are or were previously involved in the project answered an online questionnaire. A total of 10 authors answered the questionnaire - 8 were from the Biological Sciences area and 2 from Humanities. They answered a semi-structured questionnaire with six questions. Five of the questions were closed-ended and referred to the production process, such as inspiration, musical taste and affinity with a specific scientific content. The last question was open-ended and related to the slogan of the program (“Rhythms of Science”: the meeting point of music, science and culture). Data were analyzed using the Microsoft Excel package.

### **Results**

“Rhythms of Science” is a program in the format of spots of 3 to 7 minutes including a song from the Brazilian Popular Music repertoire. The program starts with a passage of the song followed by the narration of the science text that relates to that part of

the song. The text is only about 1,200 characters which is usually enough to bring about the idea although too short for explaining the scientific topics in depth.

From September, 2009 to March, 2014, one hundred and seventy eight (178) "Rhythms of Science" radio shows were produced. The songs in which the programs were based on were interpreted by very diverse bands and singers from Brazilian popular music from the 70's to the present. A wide range of fields of knowledge are covered by the radio programs, with a predominance of themes related to Biological Sciences. The chart in Figure 1 indicates the frequency of fields of knowledge that predominantly appears on "Rhythms of Science".

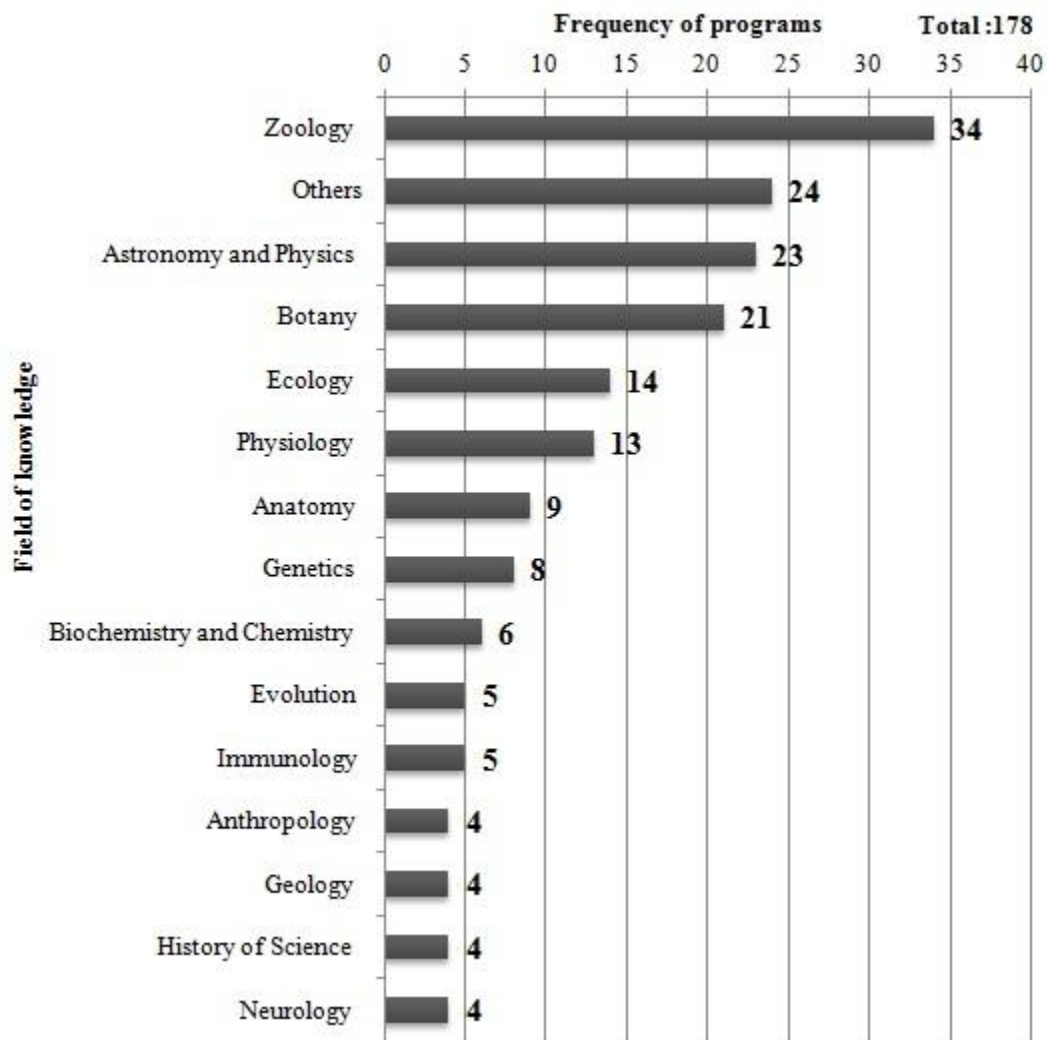


Figure 1 – Frequency of science themes on "Rhythms of Science" programs. Themes that appeared less than 4 times were omitted.

The most common themes were "Zoology" (34), "Physics" (24) - including the subarea Astronomy- and "Botany" (21). Subjects from Biological Sciences, such as "Ecology" and "Physiology", appeared frequently too (14 and 13, respectively). The list also includes themes from other areas, such as "Anthropology", "Geology", "Linguistics" and "Mathematics". Themes present in less than four programs were grouped in "Other".

The second part of the analysis was about the production process of the radio program. When asked about the inspiration to start writing a science text for "Rhythms of Science" four of the authors said that the first step is to choose a song that have in its lyrics any reference about science. A smaller number of them (2) declared that they first choose a specific topic about science, and, then, look for a song that refers to the chosen theme. The remaining writers (4) revealed that they search inspiration in both ways, without preference for a specific method.

The survey asked the author's position on the sentence: "When I write a "Rhythms of Science" spot, I avoid a science content that I do not have affinity with or master it". Four of them totally agreed with the statement, 5 partially agreed and a minority (1) disagreed.

About the song choice for the production of the radio shows, only one of the respondents said that songs were chosen solely according to the personal musical taste. Some of the authors (6) said that if they do not find a song they like, they ended up choosing any song to write the text. Others (3) stated that they elect any type of song, regardless of their musical preference.

Another question was: Does the presence of a song relating to the text help, complicate or make no difference during the production process of "Rhythms of Science". Most of the students (8) stated that music facilitates the process, while 2 claimed that the song makes no difference for helping building a text about science. None of the authors said that the song makes the writing more difficult. All of them agreed that the presence of music in a radio show that talks about science is efficient on the promotion of scientific contents.

The open-ended question intended to verify if the slogan of the program ("Rhythms of Science: the meeting point of music, science and culture") suited the aims of the radio show and what it meant for them personally. Most of the writers (9) said the

slogan matches with the aim of "Rhythms of Science". A personal interpretation of the slogan was "the use of music to speak about science is a great way to transmit knowledge". One of the students interviewed stated that the radio program allows "learning science in a different and fun way" and another emphasized that "it shows people that science is daily present in our life".

### **Discussion and Conclusion**

Listening to radio programs on science is not a habit common among Brazilians (Ministério da Ciência e Tecnologia, 2010). This does not mean that listening to music in the radio is an unusual practice. We have been producing short science programs at a University radio since 2004, a radio show called "In the Waves of Life" (Na Onda da Vida, in Portuguese) which is based on interviews with researchers from the Institute of Biological Sciences of UFMG. In both programs we attempt to deliver scientific notes to listeners and trigger their curiosity about science in a more casual communication style. Since the beginning of the production of "Rhythms of science" we believed that the use of music would increase the curiosity and interest for science in a public that would not usually listen to conventional science shows, especially because there is a link with a cultural or artistic fact. Although we do not have data from our radio listeners to address this question, the survey with the undergraduate students that participate of the radio shows can help us to understand if there is a benefit with the use of music to increase interest for science.

Based on the results, it seems that the song choice and lyrics content are very important for the production process of this radio show. Most writers recognized that a song facilitates and inspires the writing process. Also, all the writers interviewed recognized that music is as an efficient way of promoting science communication.

According to MOREIRA and MASSARANI (2006), music is an important reference on the culture of a particular era and on men's views, representations and attitudes towards life and society. The authors emphasize that science, the views about it and its impacts permeate popular culture and are expressed by the work of poets and composers. Interestingly, Zoology and Botany are the most recurrent theme in the shows. Animals and plants are strong references for the human view of the world and are widely

spread in popular music. Physiology and ecology are also well represented and shows the relationship of men with the world. Of course, the bias towards Biology is high since many of the selected students are from the biological sciences area. Although we have not included this aspect in this study, it is possible that students from the Humanities tended to see the natural sciences with the same level of challenge for writing. This means that they would write about stars with the same level of difficulty they would write about the human heart. Astronomy was a great part of the physics content and it is interesting to think about the relationship about stars, moon, and the sun with romantic ideas present in the songs.

Another aspect worth mentioning is the use of these programs in the classroom. Believing that the link with culture, informality and informative content of the "Rhythms of Science" programs make them suitable for their use in elementary and high school they were included in an educational material, called "ciência.mp3" (science.mp3), for teachers to use in Science and Biology classes. This educational material is a CDROM (also available on the Internet, through the link: [www.ufmg.br/radionaescola/cienciamp3](http://www.ufmg.br/radionaescola/cienciamp3)) containing 20 suggestions of Sciences and Biology class activities. The songs "Planeta Água", by Guilherme Arantes, and "Luz do sol", by Caetano Veloso, are two examples of famous Brazilian songs included in this material with the intention of helping in the learning process of the water cycle and photosynthesis, respectively.

In conclusion, music is an efficient tool for the production of radio shows. "Rhythms of Science" is, thus, an alternative way to disseminate science and maybe help science in the process of becoming the 'new common sense' that SANTOS (2005, 2010) proposes. The union of a Brazilian popular song with a text that talks about science in an easy language facilitates the dialogue between academic community and society, promoting science communication through radio waves.

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