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ARTICLE

# Popular knowledge and Science Teaching: an investigation in the city of Laguna, SC[i]

## *Saberes populares e o Ensino de Ciências: uma investigação no município de Laguna, SC*

## *Conocimientos populares y Enseñanza de Ciencias: una investigación en el municipio de Laguna, SC*

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**Abstract:** Popular knowledge can be considered the raw gem of scientific knowledge. However, quite often the school environment does not offer due attention to the local culture, hindering the appreciation and even the learning of such knowledge by many students. The objective of this research is to survey the main popular beliefs in the municipality of Laguna, Santa Catarina. To achieve this goal, a questionnaire was applied, in which 270 participants (including teachers, administrators and parents of students from public and private schools in Laguna SC) answered questions about popular beliefs and myths they know. 13 of the more frequently mentioned beliefs were raised and confronted with scientific knowledge about the topic. The elaborated survey aims at a better understanding of the so-called alternative knowledge which students may enroll in school being already aware of. As part of the results, in the final section, a philosophical reflection on everyday knowledge and pedagogical possibilities of this knowledge was sought.

**Keywords:** Popular knowledge. Scientific knowledge. Science teaching. Philosophy of science.

***Resumo:*** *O saber popular pode ser considerado a gema bruta do conhecimento científico. Porém, muitas vezes o ambiente escolar não oferece o devido espaço à cultura local, dificultando sua valorização e até a aprendizagem de muitos alunos. O objetivo desta pesquisa é o levantamento das principais crenças populares do município de Laguna, Santa Catarina, Brasil. Para atingir tal objetivo, foi aplicado um questionário, no qual 270 participantes (entre eles, professores, gestores e pais de alunos de escolas públicas e particulares), responderam sobre crenças e mitos populares que conhecem. Foram levantadas 13 crenças mais frequentes que foram confrontadas com o conhecimento científico acerca do tema. O levantamento elaborado visa uma melhor compreensão dos chamados conhecimentos alternativos com que os alunos podem ingressar na escola. Como parte dos resultados obtidos, na parte final buscou-se uma reflexão filosófica sobre o conhecimento cotidiano e possibilidades pedagógicas desse conhecimento.*

***Palavras-chave:*** *Saberes populares. Conhecimento científico. Ensino de Ciências. Filosofia da ciência.*

***Resumen:*** *El conocimiento popular puede considerarse la gema cruda del conocimiento científico. Sin embargo, el entorno escolar a menudo no ofrece el debido espacio a la cultura local, lo que dificulta la apreciación e incluso el aprendizaje de muchos estudiantes. El objetivo de esta investigación es estudiar las principales creencias populares en el municipio de Laguna, Santa Catarina. Para lograr este objetivo, se aplicó un cuestionario, en el que 270 participantes (incluidos maestros, gerentes y padres de estudiantes de escuelas públicas y privadas en Laguna SC) respondieron sobre creencias y mitos populares que conocen. Se plantearon 13 creencias más frecuentes que se enfrentaron con el conocimiento científico sobre el tema. La encuesta elaborada apunta a una mejor comprensión del llamado conocimiento alternativo con el que los estudiantes*

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*pueden ingresar a la escuela. Como parte de los resultados, en la parte final, se buscó una reflexión filosófica sobre el conocimiento cotidiano y las posibilidades pedagógicas de este conocimiento.*

***Palabras clave:*** *Conocimiento popular. Conocimiento científico. Enseñanza de las ciencias. Filosofia de la ciencia.*

## Introduction

Brazil is a country with vast cultural diversity, and such diversity is manifested in the customs, traditions, ways of life and knowledge produced by different individuals. These types of knowledge, also known as common sense, popular knowledge, everyday knowledge, traditional culture, beliefs[ii], among others, are central in several investigations in Education and Philosophy. In philosophy, or more specifically, in the field of philosophy of science, some sustain continuity between the empirical forms of knowledge produced in everyday life and the more elaborate forms, amongst them, science. This position is defended by Lungarzo (1994) and Alves (2000), the former stating the inexistence of a "golden rule" capable of distinguishing scientific knowledge from common sense, and the latter stating that the very distinction between science and common sense is already axiologically loaded, to devalue certain types of knowledge not recognized by the rules of the officially instituted scientific community.



There are also authors, from the most diverse philosophical viewpoints, who seek to establish demarcations or ruptures between common sense and scientific knowledge[iii]. We see this in Bachelard (1996, p. 18), according to whom "one cannot base anything on opinion: first of all one must destroy it. It is the first obstacle to overcome". Kosik (1976, p. 14, emphasis added by the author) defends that "immediate utilitarian *praxis* and the corresponding common sense put man in a position to orient himself in the world, to familiarize himself with things and to handle them, but do not provide an understanding of things and reality".

The immediacy and regularity that inhabit everyday life affect the conscience of individuals, making reality undertake a nature of independence from the individuals that act within, and also a stance of naturalness, and this constitutes, for Kosik (1976), the world of the pseudo-concrete. This world "hides" the real world, in which the truth can be understood, through a detour, a necessary effort to know the essence of things that does not show itself directly. This effort, of course, takes place through science. We put the term "hides" in quotation marks because a quick reading could lead the reader to understand that these are two ontologically distinct worlds, when, in fact, this is not what the philosopher wanted to consider:

> The real world, concealed by the pseudo-concrete, and yet manifesting itself in it, is neither a world of real conditions opposed to unreal ones, nor a world of transcendence opposed to a subjective illusion, but a world of human praxis. It is the comprehension of socio-human reality as the unity of production and products, of subject and object, of genesis and structure. The real world is thus not the world of "fixed real" objects leading a transcendental existence behind their fetishized forms, as in some naturalistic parallel to Platonic ideas; rather, it is a world in which

> things, meanings and relations are conceived as products of social man, with man himself exposed as the real subject of the social world (KOSIK, 1976, p. 23).

The efforts of Popper (1999) for a demarcation between scientific knowledge and pseudoscience are also well known. However, the philosopher recognizes that all rational, scientific, and/or philosophical thinking must begin with common sense, and that "all philosophy and all science are enlightened common sense" (POPPER, 1999, p. 42). Because of that, it might be more appropriate to place Popper in a middle ground between the positions of Lungarzo and Alves and Bachelard and Kosik.

If we consider knowledge as a highly developed product of a biological activity that could only occur as it did in humans, as Vieira Pinto (1979) states, we see that knowledge in general, and scientific knowledge in particular, is one of the ways to obtain control over nature. With this, humans go beyond mere passive adaptation, characteristic of other living beings, and starts to adapt the environment to their needs, that is, an active adaptation, the transforming role that only human beings hold. This active and conscious transformation of the environment takes place through work. In the words of the author:



> What matters most is to understand that human consciousness, which will be the source and agent of scientific creation, is included in the continuity of a natural process, participates in the essential traits that define it, only distinguishing itself by the complexity it has reached, without needing to recognize any transcendental origin, foreign to the forces that drive the series of transformations of living beings [...]. Every living being in some measure dominates the environment in which it finds itself. Only by exercising this faculty is it defined as living, and effectively preserves itself, both in the period of its individual duration and in the evolutionary capacity of the species to which it belongs. But the essential condition to achieve dominance over nature, which every living being must exercise at the risk of ceasing to exist, either individually or as a species, is that the living being must know the world, taken in the latent sense in which we allow ourselves to use it (VIEIRA PINTO, 1979, p. 22-23, our translation).

In the field of education, the oppositions are not scarce. On the one hand, some authors defend an intense articulation between cultural and school knowledge, understood as a form of mediation between daily knowledge and scientific knowledge. This position is mainly adopted by those who show affinity with the studies of multiculturalism, such as Moreira and Candau (2003) and Candau (2008), and those for whom the school curriculum should lack foundations that establish universal criteria for the legitimacy of the contents to be selected (LOPES, 2015). On the other hand, there are authors such as Duarte (2003; 2006) who, although considering the opposition between multiculturalism and ethnocentrism to be false, still place a differentiated stress, not without reason, on scientific knowledge for human learning.

For Duarte (2006), the opposition between multiculturalism on the one hand, with an emphasis on local cultures and the impossibility of universal human culture, and ethnocentrism on the other, to which the value of certain knowledge is attributed according to the ethnic group from which it originated, is one of the issues spread by postmodernism. Based on this false opposition, advocates of postmodernism argue that any educational project based on the existence of a universal human culture, of which science is a constitutive part, is authoritarian, conservative, and ethnocentric.

Whether it is to incorporate it into teaching or to overcome it, popular knowledge needs to be studied first, because as world views of subjects who belong to a certain context, this type of knowledge, even when it contradicts a scientific view of the world, is also part of reality. And the first step, necessary but not sufficient, to transform reality, is to know it. Second, because with knowledge of the most widespread beliefs in a given region, teachers will be better prepared to elaborate classes and select contents.

Nascibem e Viveiro (2015, p. 286) ponder that "[...] science must be considered as a human construct, as such, it is fallible, dynamic, changeable. Abandoning a dogmatic and closed attitude in science means broadening one's horizons [...]". In line with the authors' view, we believe that popular knowledge has a relevant role in the students' learning process, based on the awareness of its existence by the students and its approach in the teaching of the Natural Sciences. The importance of investigating popular knowledge and how it can dialogue with the scientific knowledge taught in the classroom is therefore considered justified.



Bearing in mind the philosophical and pedagogical elements discussed so far, the objective of the present work is to know what are the main bits of popular knowledge spread in the community of Laguna, located in the south of the state of Santa Catarina - Brazil, and how they can dialogue with scientific knowledge, serving as a support for possible contextualization in science classes in elementary education. Furthermore, research that provides an inventory of popular knowledge of a given population are extremely important for the areas of Education and Teaching and methodologically supports this study, for example, the works of Lopes (1999), Chassot (2008), Gondin and Mól (2009), Baptista (2010) and Xavier and Flôr (2015).

## Methodological course of investigation

In this study, we have opted for qualitative research, as it is exploratory, since the study was carried out in a school environment. To achieve the objective, a pre-survey was carried out with 30 people from the region, to collect the 50 best known bits of popular knowledge. Then, a mixed questionnaire (with open-ended and closed-ended questions) was created in order to collect the main popular beliefs of the region, answered by teachers, administrators and parents/guardians of students from three public schools and two private institutions.

The location chosen for the research is Laguna, at the southern coast of Santa Catarina, Brazil. The city has undergone constant cultural changes and its inhabitants have ranged from prehistoric peoples, indigenous tribes and Azoreans to the current population. Santos and Arantes (2010, p. 3, our translation) state that:

> [...] the city has been a growing destination for a significant number of tourists and this flow of visitors, together with other vectors of modernisation, such as the media and industrial fishing, make up a picture of accelerated cultural change which is quite complex, with significant developments in the lives of the native population, traditionally linked to subsistence fishing.

It is undeniable that the cultural heritage of the place has generated an immense collection of popular knowledge, passed down through generations, which should not be lost, but rather used in all spheres of society, especially in the school environment.

According to Marconi and Lakatos (1999), questionnaires are data collection tools consisting of a series of questions, which must be answered in writing. A mixed questionnaire (Appendix A) was prepared and delivered to two hundred and seventy interviewees, distributed in schools. The data were then tabulated, interpreted and arranged in graphical representations for better comparison and interpretation of the answers.

The public schools were selected according to their location: one in the central region and two in peripheral regions of the city. In regards to the private schools, the city has only two representatives in this category. The participants in this research voluntarily adhered to data collection by signing the Term of Informed Consent (TIC), a document in which they stated to be aware of the purpose of the research. The respondents were: 56 teachers (from the areas of Science/Biology, History, Geography, Arts and Religious Education), whose subjects of expertise work more with popular knowledge and who accepted to participate in this research; 14 school administrators and 200 parents/guardians, according to Table 1.



**Table 1.** Survey respondents.

| Place | Teachers | Administrators | Parents or Guardians | Total |
|---|---|---|---|---|
| School 01 | 10 | 3 | 40 | 53 |
| School 02 | 12 | 3 | 40 | 55 |
| School 03 | 14 | 4 | 40 | 58 |
| School 04 | 10 | 2 | 40 | 52 |
| School 05 | 10 | 2 | 40 | 52 |
| **Total** | **56** | **14** | **200** | **270** |

Source: Authors' data.

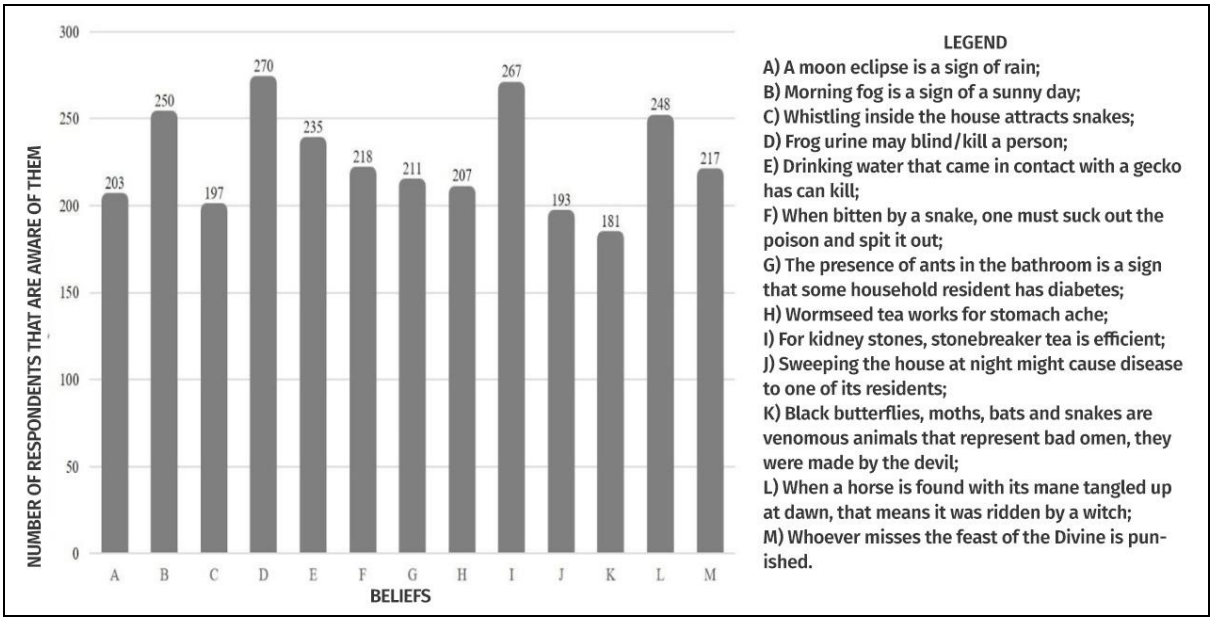
The data collection period was from March to May, 2018. In the next item of this article we will analyze the results of the data collected in the context of the investigation.

## Results and discussion

After applying the questionnaires, the data were arranged into a table and the analysis was executed, with the thirteen most frequent and widespread popular beliefs in the community being selected (Figure 1).

In the figure below, we can see how many of the people who answered the questionnaire knew each of the selected beliefs, either as yes/no questions or essay question (open-ended).

**Figure 1**. Most well-known popular beliefs in the city of Laguna, SC.






Source: Authors' data.

There are among the beliefs (A, B), popular sayings referring to the weather such as: "a moon eclipse is a sign of rain" and "morning fog is a sign of a sunny day". Since fishing is the main source of income for many locals, it is possible to infer that the fishermen are concerned with the weather forecast to figure out what the working day will be like, and it is only natural that they mention these sayings within their family circle or even in the community itself.

Regarding the belief (C) "whistling inside the house attracts snakes" it is important to point out that snakes, frogs, geckos and ants are some of the representatives of the local fauna and such myth, for many interviewees, may have been invented as a pretext by some mother tired of hearing her son whistle. There is also the possibility, perhaps more plausible, that such a belief is related to the sounds emitted by some snakes, which resemble whistling[iv].

Belief (D) stated that "frog urine can blind/kill a person". The animal's urine presents no danger to humans, as when threatened by a predator, all anurans release a liquid produced by the poison gland located behind their eyes, which only frightens and scares away those who captured it. Although the chemicals present in the skin of amphibians are potentially toxic, they only serve as a defense against their predators and various pathogenic microorganisms. The only species that can be lethal to humans if the toxins from the skin reach the bloodstream is the Phyllobates terribilis frog (Anura: Dendrobatidae), an animal natural to the forests of Colombia (COLOMBO; ZANK, 2008).

The popular knowledge (E) stated that "drinking water that a gecko came in contact with can kill". There were reports from many interviewees of a family that had been decimated, victim of a gecko that was inside their water filter, although no documented proof was found. However, the team at the Regional Nucleus of Ophiology at the Federal University of Ceará (2011) states that:

> There is no information in scientific literature that reports any toxic substance in the tail composition of geckos. Some species may develop alluring tails that attract the attention of their predators, but even in these species there is no report that they have any toxic ingredient in their tails. The tails of geckos are composed of bones that make up the vertebrae, musculature, blood vessels, innervation, and fat [...]. So why expect the tails of beautiful geckos to contain poisonous substances? [...] (NUROF-UFC PROJECT, 2011, s.p., our translation).

Item (F) states that "when bitten by a snake, one must suck out the poison and spit it out". This practice is considered ineffective and dangerous by herpetologists, doctors and rescuers at the Butantan Institute (s.d.), although this myth was frequently mentioned during the application of the questionnaire. The topic of snakebite incidents has already been discussed in some research regarding teaching, such as Sandrin, Puorto and Nardi (2005) and Guimarães (2010) who analyzed science textbooks. Procedures after accidents are still seldom addressed in textbooks, and since the book is often the main or even the only source of scientific reference for children, it is worrying that this belief is so widespread. Furthermore, government recommendations object the use of punctures or any other means to remove the poison from those who have suffered a snakebite accident (BRASIL, 2017).



Item (G) states that "the presence of ants in the bathroom is a sign that some household resident has diabetes". According to Maccracken, Hoel and Jovanovic (1997), the attraction of ants to the urine of certain people who exhibited certain health conditions was, historically, one of the first ways to diagnose what we now know as diabetes.

About statement (H) "wormseed tea works for stomach ache", Oliveira (2011), regarding the medicinal practices and prayers used by the Lampião gang, states that if any member of the group was affected by pharyngitis or intestinal pain, wormseed tea and gargle with salt were the medicines used. However, this origin seems unlikely for this belief within the town. Another study about this subject seems to fit more with the reality of the city, as wormseed tea refers to the plant commonly known as wormseed, Chenopodium ambrosioides L. (Chenopodiaceae), a herbaceous plant with a strong aroma, native to tropical America and native to Mexico.

In Brazil, this species is widespread, with occurrences in almost the whole territory, receiving several popular names, being the most common *mastruz*, *mastruço* or *erva-de-santa-maria* (SÁ, 2013). The plant is easily found in backyards and vacant lots in the region of the county of Laguna. Its main uses are: treatment of ascariasis; control of arthropods and domestic pests; inhibition of the development of soil fungi and insects, such as Scrobipalpula absoluta (Lepidoptera: Gelechiidae) (tomato leafminer) and Spodoptera frugiperda (Lepidoptera: Noctuidae) (fall armyworm); treatment of skin lesions caused by Leishmania (Viannia) braziliensis (Trypanosomatida: Trypanosomatidae) (FRANÇA; LAGO; MARSEND, 1996); and relief of stomach ache and flu (MOREIRA *et al.*, 2002).

Regarding the popular knowledge (I) "for kidney stones, stonebreaker tea is efficient", according to Schor (2001), the tea of the plant with the scientific name Phyllantus niruri (Malpighiales: Phyllanthaceae), is as effective as the specific drugs for the disease, as it prevents the aggregation of calcium oxalate crystals (component of kidney stones) and prevents the development of new stones. However, it does not "break the stone", it only

prevents the already existing calculus from growing, and it is considered an excellent natural preventive remedy for those who have a predisposition to the disease.

Regarding the belief (J) “sweeping the house at night might cause disease to one of its residents”. The floor of the house is one of the surfaces with the highest concentration of microorganisms, among them fungi, viruses and bacteria. When we sweep the house, all these organisms are suspended into the air, along with the dust. According to Palma and collaborators (2007), the human body is more susceptible to microorganisms entering through air when it is at rest, which happens more often at night when we go to sleep.

The beliefs (K) “when a horse is found with its mane tangled up at dawn, that means it was ridden by a witch” and (L) “black butterflies, moths, bats and snakes are venomous animals that represent bad omen, they were made by the devil”, are also quoted beliefs of Azorean heritage. Many beliefs with religious origins were also be observed, such as: "Whoever misses the feast of the Divine is punished" (M). According to Silveira (2010, p. 7, our translation) in her research entitled “The Immigration of Azorean Women in Santa Catarina: from Subversion to Witchcraft”:



> A Luso-Brazilian belief attributed to or directed at women is the phenomenon of witchcraft. Franklin Cascaes (1908-1983), considered the greatest researcher of Azorean customs in Santa Catarina, never collected any narrative of Azorean descendants who had a male wizard as a character. They were always women and, as in Europe, “hellish”.

Still according with Silveira (2010, p. 7, our translation), “some witches feed on the blood of farm animals and make the horses' lives hell, making them ride all night, desperate to the point of exhaustion, and make untieable knots in their tails and manes”.

As it can be observed, the beliefs and myths of the community of Laguna are very eclectic, of different origins and meanings. Regardless of their veracity, they are representatives of the local culture and should be valued as such. Furthermore, surveys in regard to popular knowledge, the beliefs of a given region, are important as a catalogue for research by the scientific community in the areas of Education and Teaching.

We now bring two reflections, one of a philosophical nature and the other of a pedagogical one. Lukács (2013) states that both scientific knowledge and knowledge of everyday life can provide approximation or detachment from the true essence of things, and that it is not up to either form of praxis to create a schematic arrangement about the world, as if one of the two were a kind of helmsman always leading the right path to the ship of knowledge. In the author’s words:

> We have seen [...] how both in the *intentio recta*[v] of everyday life and in that of science and philosophy , social development can create situations and orientations that deflect this *intentio recta* and divert it from grasping the reality of being. The ontological criticism that thereby becomes necessary must therefore be unfailingly a concrete criticism, based in the social totality of the time and oriented towards it. It would be extremely erroneous to assume that in all cases science could appropriately correct every day thought and philosophy the sciences, or that conversely everyday thought could play for science and philosophy the role of Moliere 's cook (LUKÁCS, 2013, p. 97-98).

At this point, we propose two reflections, one more philosophical and the other more pedagogical. Different from the inorganic being (matter in its solely physical components) and from the organic being (of which the beings we usually call living are part), the social being (human being) acts over the world in an oriented manner, that is, human action has a finalistic aspect, or, as Lukács states, action is preceded by teleology, which determines precisely the purpose of action.

Because of the need to act, in certain circumstances, humans always have an understanding of this reality (the ontological domain), before the elaboration of any explanatory statement (the epistemological or gnoseological domain). This practical need to act often leads individuals to confront their own theoretical system regarding reality. As Lukács (2010, p. 272, our translation) states, if "the apprehension of the ontological constellations indispensable to praxis" is not sufficient, or, in clearer terms, if the understanding of reality does not succeed in solving the problems that present themselves directly to individuals, human beings, often at the risk of perishing, "needs to leave the limits of everyday thinking" (LUKÁCS, 2010, p. 272), that is, they need knowledge of another kind, different from the immediately established in confrontation with the object, in order to achieve their ends. This different knowledge concerns other spheres, superior in terms of mediation and elaboration in relation to everyday knowledge, such as science, philosophy and art. It is this knowledge that enriches everyday life and enables individuals to gain new understandings and, by extension, a distinct praxis. It is assumed that this is the knowledge that schools aim at teaching, as emphasized by Duarte (2019).



As Kosik (1976) demonstrates, the appearance of things is often different and sometimes even contradictory to the laws that govern these same things. Although, as humans are beings of action, beings that provides answers, the appearance of things allows us to formulate an immediate knowledge and, by using this, to substantiate a utilitarian praxis, a maneuver, that, in daily life, answers many demands.

> "Real existence" and phenomenal forms of reality are directly reproduced in the minds of agents of historically determined praxis as a set of ideas or as categories of 'routine thinking' (considered only out of a 'barbarian habit' to be concepts). But these phenomenal forms are diverse and often contradict the law of the phenomenon, the structure of the thing, i.e., its essential inner kernel and the corresponding concept. People use money and carry out the most complicated transactions with it without ever knowing, or having to know, what money is. Immediate utilitarian praxis and corresponding routine thinking thus allow people to find their way about in the world, to feel familiar with things and to manipulate them, but it does not provide them with a comprehension of things and of reality (KOSIK, 1976, p. 14, emphasis in the original).

Paradoxically, and here we get into reflections on teaching, it is on this distinction between the levels of understanding of individuals and, therefore, of their praxis, that the possibility of culture and instruction is based, through which

> one ascends from a preliminary understanding to a conceptual cognition of reality. The belief that reality in its phenomenal appearance [common sense or popular beliefs, one could argue] is a peripheral and negligible issue for philosophical cognition and for man leads to a fundamental error: ignoring the phenomenal

> appearance amounts to closing the door to the cognition of reality (KOSIK, 1976, p. 37, our addition).

In other words, the phenomenal, the immediate, is an indispensable element for a more effective, more elaborate knowledge, and in this lies the possibility of instruction or education. Moreover, the processes of development of both spontaneous and scientific concepts, although following different paths, are one and the same process, according to Vigotski (2008). This relationship between the two types of concepts, the spontaneous and scientific, is precisely the relationship between school learning and children's mental development. Through the historical-cultural psychology developed by Vigotski, we can find the pedagogical importance for the investigation of spontaneous concepts, or popular knowledge:

> In the scientific concepts that a child acquires at school, the relationship with an object is mediated from the beginning by some other concept [common sense, everyday knowledge, popular knowledge]. Thus, the very notion of scientific concept implies a certain position in relation to other concepts, that is, a place within a system of concepts (VIGOTSKI, 2008, p. 116, our addition and translation).



Vigotski shows that without spontaneous concepts, the development of scientific concepts becomes impossible. At the same time, learning scientific concepts produces a transformation of the spontaneous concepts present in everyday life. Scientific concepts embody the spontaneous and, simultaneously, transform and transcend them.

> By forcing its slow upward trajectory, an everyday concept opens the way for a scientific concept and its downward development. It creates a series of structures necessary for the evolution of the most primitive and elementary aspects of a concept, which give it body and vitality. Scientific concepts, in turn, provide structures for the upward development of the child's spontaneous concepts in relation to consciousness and deliberate use. Scientific concepts develop downwards through spontaneous concepts; spontaneous concepts develop upwards through scientific concepts (VIGOTSKI, 2008, p. 136, our translation).

With all of the elements brought along in this article, we can return to the considerations made initially and reject positions such as those of Moreira and Candau (2003), Candau (2008) and Lopes (2015), for whom the school curriculum should undergo a modification of a predominantly multicultural nature, thus shattering precisely the power in which the teaching of scientific concepts resides, in the process of cognitive development of students. With this, we do not intend to underestimate everyday knowledge, the popular knowledge, which is exactly what was investigated in the present study, that we believe students incorporate in their daily lives. Vigotski's decisive contribution lies precisely in showing that the development of scientific concepts depends on spontaneous/everyday concepts and that, with this knowledge, teachers can develop richer and more inclusive pedagogical practices.

## Final considerations

This study aimed at investigating the popular beliefs (or popular knowledge) present in the school community of Laguna. We also sought to establish possible connections between these beliefs and current scientific knowledge, as well as proposals from the philosophy of science that, in some way, promote exchanges with so-called common sense. It is important to emphasize here two extremes that we do not intend to align ourselves with: that of extreme scientificism, which considers popular knowledge as irrational or despicable, and the equally naïve exaltation of the traditional culture of students, or of empirical/everyday knowledge, as if, based on this knowledge, it were possible to develop a curriculum.

Thus, the 270 questionnaires spread to five schools, with teachers, administrators and parents responsible for students as respondents, represent not only an indispensable document for this research, but also a collection of the region's culture. We found that popular knowledge both finds a certain support in scientific knowledge (such as the case of the stonebreaker tea and the ants in the bathroom indicating a possible case of diabetes), as a complete disagreement with what is established by science (such as beliefs about possible harm when in contact with animals such as frogs and geckos).



As we have pointed out before, the intention throughout our research was not to dichotomize popular knowledge and scientific knowledge. We hope, with the contribution of our study, to offer a greater articulation between the so-called popular knowledge and scientific knowledge, especially the interrelationship between these two forms of knowledge in the school environment, following the example of works such as Gondin and Mól (2009), showing the importance of both forms of knowledge for human development. To this end, we believe in a distinct praxis, in which the importance of scientific knowledge resides, especially those in which the beliefs investigated here also manifest themselves.

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## Notes

[i] Translated by Caroline Almeida Santos - Email: caroline.almsantos@gmail.com - Lattes: http://lattes.cnpq.br/8731122263228225.

[ii] For the purposes of this study, we will not make any distinction between these expressions.

[iii] With that statement we do not intend, in any way, to establish any identity of thought among the authors mentioned. We solely intend to highlight this point in common, of the distinction between scientific knowledge and other forms of knowledge, as opposed to the opinion of the authors mentioned above (Lungarzo and Alves).

[iv] Report available at: https://globoplay.globo.com/v/2568453/.

[v] *Intentio recta* and *intentio obliqua* are categories that Lukács takes from philosopher Nicolai Hartmann. They are important categories to distinguish the thought of the two philosophers, of ontological nature, in relation to the most diverse epistemological or gnoseological approaches. While *intentio recta* is directed towards the conformation of the object as it is, with its permanent regularities, *intentio obliqua* reverses the natural course of knowledge by not directly asking what the object (or reality) is, and by defining, first of all, what are the possible conditions for this object or reality to be knowable.

## Appendix A

**I – Identification**

Date: ____/____/____
Name:_____ Age:_____
Place of birth:_____
Are you:
(_) Student's guardian – If so, which grade?_____
(_) Teacher – If so, which subject?_____
(_) Administrator – If so, what position do you hold?_____
(_) Other – What?_____
School name:_____

**II – Questions regarding popular knowledge**



**1. Mark with an X in the column next to your answers:**

| | Yes | No |
|---|---|---|
| 01) Do you know what a myth/belief/popular knowledge is? | | |
| 02) Do you know any myth/belief/popular knowledge? | | |
| 03) Do other people in your region know about these beliefs you know? | | |
| 04) Are any of these beliefs known only within this region? | | |

**2. Have you heard any of the following statements?**

| | Yes | No |
|---|---|---|
| 01) Mixing milk and mango is bad for your health. | | |
| 02) Drinking coffee while exposed to the sun causes one's mouth to twist. | | |
| 03) Inserting a black cat's tail in the ear cures earache. | | |
| 04) Eating "siamese bananas" (two bananas that sprouted stuck together?) increases the possibility of having twins. | | |
| 05) If it rains during the first moon of August, it will rain all month. | | |
| 06) It is dangerous to face a mirror during a thunderstorm. | | |
| 07) Whistling inside the house attracts snakes. | | |
| 08) It is possible to determine a baby's sex by the shape of the mother's stomach. | | |
| 09) Eating ants is good for eyesight. | | |
| 10) Swimming after a meal might cause indigestion. | | |
| 11) Watching TV while close to the screen is bad for eyesight. | | |
| 12) Using the computer for too long is bad for eyesight. | | |

| | | |
|---|---|---|
| 13) Warm milk helps sleeping. | | |
| 14) Swallowing gum is bad for health (it sticks to the stomach's walls). | | |
| 15) A frog's urine might blind a person. | | |
| 16) Frogs can squirt poison. | | |
| 17) Cats always fall on their feet. | | |
| 18) Lightning never hits the same spot twice. | | |
| 19) Bees die after stinging someone. | | |
| 20) A dog year equals seven human years. | | |
| 21) Nails and hair keep growing after death. | | |
| 22) Snapping your fingers might cause arthritis. | | |
| 23) We should know which phase of the moon we are at before getting a haircut. | | |
| 24) Reading in the dark is bad for eyesight. | | |
| 25) Inserting a chick in a baby's mouth will help them learn how to speak faster. | | |
| 26) A moon eclipse is a sign of rain. | | |
| 27) Sweeping the house at night makes the household residents grow sick. | | |
| 28) Redheads will be extinguished in 50 years. | | |
| 29) The color of nasal mucus indicates which type of infection it is. | | |
| 30) Human blood may be red or blue. | | |
| 31) Giving sugar to a child might make them hyperactive. | | |
| 32) The HIV virus came from monkeys. | | |
| 33) We only use 10% of our brain capacity. | | |
| 34) The earth is flat. | | |
| 35) Using the microwave might cause cancer. | | |
| 36) Storing water in plastic bottles is bad for your health. | | |
| 37) The more body hair is shaven, the thicker it grows. | | |
| 38) Drinking water that a gecko came in contact with can kill. | | |
| 39) Eating grapes or drinking their juice helps rejuvenate. | | |
| 40) Bathing in coarse salt water dispels bad energy. | | |
| 41) Cutting your nails during a new moon makes them weaker. | | |
| 42) Pointing to the stars might cause moles to grown on fingers. | | |
| 43) Killing a frog and leaving the corpse belly up causes it to rain. | | |
| 44) Leaving a study notebook under the pillow helps with memorization. | | |

| | | |
|---|---|---|
| 45) Crossing under a ladder causes seven days of bad luck | | |
| 46) When bitten by a snake, one must suck out the poison and spit it out. | | |
| 47) Dogs can smell fear. | | |
| 48) Women cannot wash their hair while on their period, otherwise they will go crazy. | | |
| 49) Eating chocolate or butter causes acnes to appear on the face. | | |
| 50) Seating incorrectly causes the back to twist. | | |

**3. If you know any other popular beliefs that were not mentioned above, please share:**

_____

_____