THE USE OF INFERENCE IN A SCIENTIFIC COMMUNITY

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INTRODUCTION

The logic of the statistical inference, in particular hypotheses tests, present conceptual difficulties related to Philosophy and Psychology, which make it susceptible of misinterpretations. Moreover, since the beginning of the development of this methodology a strong conceptual controversy among its prominent proponents emerged. Over the time these differences have remained hidden, as a teaching methodology combining different approaches has been adopted. This process of synthesis, built over a base of concepts that are not necessarily in agreement, is the one generally taught and therefore applied.

THE STUDY

The present research aims at studying the uses that a scientific community from Biology does of statistical inference, especially regarding hypothesis test and p-value. Using the theoretical framework of socioepistemology (Cantoral & Farfán, 1998), we analyze the social practices depicted in doctoral dissertations on Biology and in the interviews to experts in the same discipline, belonging to a university in the center of Argentina. This work provides evidence of some of the main problems in using hypothesis tests in this professional and research community, such as: the belief that the rejection of the null hypothesis implies the truth of the theory that predicts that the null hypothesis is false; the belief that a small p-value constitutes an evidence in favor of the replications of the results; a belief that a small p-value implies a large treatment effect. Moreover, it is also common to observe a mechanical use of p-value, showing evidence that there is no verification of those assumptions necessary for the validity of the conclusions derived from its application and ultimately an incomplete knowledge of them, as well as, of the implications of their improper use.

CONCLUSION

The identification of incorrect uses and interpretations of hypothesis tests will contribute, through further research, to the design of teaching interventions that improve the training of future researchers in the field of Biology

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