

# PROFILES IN LOGIC AND MATHEMATICAL PERFORMANCE IN CALCULUS TASKS BY GRADUATE STUDENTS

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The role of proof in maths education has been stressed in numerous studies (Hanna, 2000). In a previous study (Rogalski & Rogalski, 2001) we showed the difficulties students encountered when dealing with implications with a false premise, a case that appears in advanced mathematics. Durand-Guerrier (2003) also emphasises the specific complexity of an implication  $P(x) \Rightarrow Q(x)$ , where property P can be or not be satisfied by the objects under analysis. This is often the case in calculus with quantified assertions. Studies concerning this level strongly suggest that there are strong relationships between students' logical and mathematical competence.

The study which will be exposed (in a graphical form) aimed to go further on this point. It is based on the answers of 178 graduate students to a test about reasoning in everyday domains and in mathematics. In (Rogalski & Rogalski 2001) we defined four profiles of students from their behaviour when confronted to implications with false premises. Such profiles correlated with performances in several reasoning tasks (Rogalski & Rogalski 2001, 2003). Now we will present data showing that students' with "logical" or "pertinent" profiles succeed better than the two other profiles in tasks involving property of rational numbers or behaviour of real sequences. In fact, three factors appear to affect graduate students' behaviour in calculus tasks: logic-based profiles, availability of calculus knowledge, and strategies for managing somehow complex mathematical tasks. Perspectives for further research are proposed.

## References

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