

## **WS04: THE COMPLEXITY OF LEARNING TO REASON PROBABILISTICALLY**

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### **NATURE AND TOPIC OF THE WORKING SESSION**

This Working Group was formed at PME-NA 20 and has since convened annually at PME-NA. During the joint meeting of PME-NA 25 and PME 27 in 2003, we expanded our working group to include international researchers from 11 different countries. Through shared research, rich and engaging conversations, and analysis of instructional tasks, we continually seek to understand how students learn to reason probabilistically.

### **AIMS OF THE WORKING SESSION**

There are several critical aims that guide our work together. In particular, we are examining: (1) mathematical and psychological underpinnings that foster or hinder students' probabilistic reasoning, (2) the influence of experiments and simulations in the building of ideas by learners, particularly with emerging technology tools, (3) learners' interactions with and reasoning about data-based tasks, representations, models, socially situated arguments and generalizations, (4) the development of reasoning across grades, with learners of different cultures, ages, and social backgrounds, and (5) the interplay of statistical and probabilistic reasoning and the complex role of key concepts such as sample spaces and data distributions. Through our work, we have stimulated collaborations across universities and plan to engage in and support additional research.

### **PLANNED ACTIVITIES**

At PME 27, members of the Working Group decided to create a listserv to promote follow-up contact and subsequent discussion through the use of e-mail. Through this listserv, we suggested several tasks that can be used with a variety of students in a variety of contexts. It was agreed that several participants use a single task with students. Data will be collected in the form of videos and paper-and-pencil work. This data, collected across contexts, cultures, and ages, will serve as a common data set for our continued work at PME 28 (Norway) and PME-NA 26 (Toronto). In particular, during our sessions, we plan to collaboratively analyze videotape data of students' probabilistic reasoning on a task by using several different theoretical perspectives. From this analysis, we seek to generate additional authentic tasks that are appropriate to elicit and extend students' probabilistic reasoning into a broader perspective that includes statistical reasoning.

We are planning to maintain this working session group in both organizations so that international collaborations can continue. Several participants will be attending both PME 28 and PME-NA 26 in order to allow for consistency and communication across groups. It is hoped that our analysis of students' work on this task will lead to a set of papers that describe our work. These papers could be part of a monograph, journal special issue, and joint presentations at future conferences.