Comparison of the Tabach-Friedlander (TF),
and the Viviane Durand-Guerrier (VDG) papers.

In our paper, we (TF) present five components of the design process – mathematical content, context of inquiry, level of openness, representations and task sequencing, and examine the relation between the structure of an investigative task and the students' hypothetical and actual learning trajectories.

VDG shows how an analysis based on logic and semantics influences the content and structure of a mathematical project.

We could distinguish both similarities and differences between the two papers in their approaches to task design.

Similarities

- Both papers are based implicitly on the assumption that task design plays a crucial role in math education. This statement seems obvious, but the relative emphases allotted to task design, teaching practices and student cognition vary among approaches to math education.
- We also agree that the design process requires both careful a priori theoretical analysis and empirical experimentation followed by corresponding modifications of the original task and theoretical conclusions.
- We think that both papers present good examples of mathematical tasks that have a naturally embedded potential for an ***active*** learning of new mathematical concepts and tools.
- Both papers consider the choice of context (mathematical in VDG and "school-life" in TF) an important aspect of design.

Differences

- The source of some differences can be related to the targeted student populations (junior high in TF vs. high school in VDG), and to the extent of the tasks (two lessons in TF vs. a four-month-long project in VDG) – rather than to differences in approach to task design.

- In our view, the learning of abstract mathematical concepts and representations is a student goal that can be achieved by a complex and long-range process that starts with inductive reasoning. Deductive logical considerations play a more dominant role only at later stages of investigation of a concept or tool. Thus, the "back and forth between active work with familiar mathematical objects and theoretical elaboration" described in VDG does not necessarily occur in parallel. Moreover, the acquisition of a mathematical concept at an abstract and formal level is not always the goal of the task designer. Students are frequently at a stage that requires an almost exclusive use of informal and intuitive considerations. These are the early stages of learning a concept, and sometimes they precede by several years the acquisition of the same concept at an abstract and formal level. We also know that sometimes, the designer's mathematical-logical analysis of a task as leading to a formal solution can be "bypassed" by a completely informal (and frequently very creative) student solution. Did the designers achieve their goal in this case?
- The mathematical-logical analysis of a task is the first stage in analyzing the potential of a designed task. A New Math-based approach to task design tends to rely mainly on mathematical considerations. However, two tasks that are equivalent in this aspect can be radically different in aspects of students' cognition, pedagogy or classroom implementation. A constructivist approach will consider additional aspects as well. In our opinion, the design of investigative tasks does not depend solely on considerations based on mathematical-logical considerations.
- The TF paper mentions three additional aspects in task design - level of openness, representations and task sequencing. We think that the design of both tasks required elaborate task sequencing. The tasks differ however on their level of openness. The advantages and disadvantages of a low and a high level of this parameter are discussed and analyzed in our paper. We would like to note here that the more closely structured sequence of questions in our task, allowed a larger scaled and more structured evaluation.

We would be glad to discuss in our TSG a wider variety of considerations in task design.