

A Random Walk with Drift: Interview with Peter J. Bickel

Ya'acov Ritov

I met Peter J. Bickel for the first time in 1981. He came to Jerusalem for a year; I had just started working on my Ph.D. studies. Yossi Yahav, who was my advisor at this time, busy as the Dean of Social Sciences, brought us together. Peter became my chief thesis advisor. A year and a half later I came to Berkeley as a post-doc. Since then we have continued to work together. Peter was first my advisor, then a teacher, and now he is also a friend. It is appropriate that this interview took place in two cities. We spoke together first in Jerusalem, at Mishkenot Shaananim and the Center for Research of Rationality, and then at the University of California at Berkeley. These conversations were not formal interviews, but just questions that prompted Peter to tell his story.

The interview is the intellectual story of a post-war Berkeley statistician who certainly is one of the leaders of the third generation of mathematical statisticians, a generation which is still fruitful today.

The conversation was soft spoken, a stream of memories, ordered more by association than by chronology. In fact, I led Peter to tell his story in a reverse direction, starting from the pure science and ending with the personal background. So, please sit back, and imagine you are part of the chat.

Peter, if you try to summarize the many stages of your career, how do you characterize the different periods?

A random walk with drift. Shall I start with the very beginning?

No, for now can you tell us about your academic career?

I would say that the first period was almost exclusively theoretical work, but actually, I think, almost from the beginning, driven as much by people as by a focus on the subject.

I did my thesis with Erich Lehmann. From the thesis, I published two papers on multivariate analogues of Hotelling's T^2 (Bickel, 1964; Bickel, 1965a), really not knowing much about multivariate analysis at all,

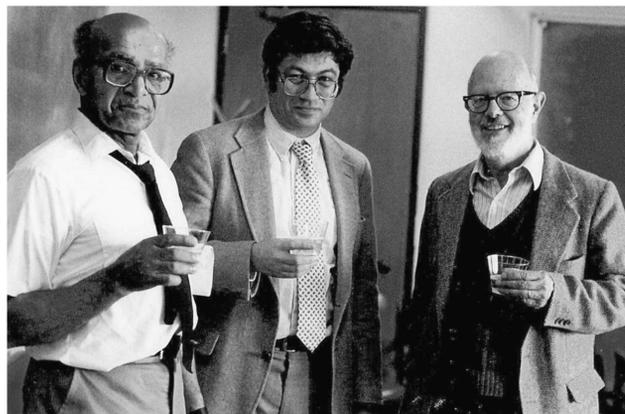


FIG. 1. David Blackwell, Peter Bickel and Erich Lehmann at a party celebrating Peter's election the National Academy of Science.

learning asymptotics as I went along. After the thesis, partly talking with Peter Huber, and partly talking with Erich Lehmann, I did some interesting things on questions of robust estimation. I had a paper on trimmed means and how they compare to the mean and median (Bickel, 1965b); again, the results were in the spirit of Hodges and Lehmann.

The next stage happened by a curious accident due to Govindarajulu. He asked me if I had ever thought about investigating linear combinations of order statistics. I said, no, but I had some ideas, having learned about weak convergence of stochastic processes. Initially, he said he wanted to work with me, but, at the same time, he was talking with people in Stanford; and then he carried the problem to Le Cam. The result was, finally, that the problem was attacked with three different approaches. One was the approach of the Stanford group, growing from the work Herman Chernoff did on rank statistics, mine, using weak convergence of the quantile process (Bickel, 1967), and Le Cam's, which used the Hájek projection technique. We all got results.

Within this work, I was very pleased about the result that the covariance of two order statistics is non-negative, which Richard Savage claimed was a long unsolved problem. Then it turned out that it was an inequality in Hardy, Littlewood and Polya. This work also led to work in multivariate goodness of fit tests and

Ya'acov Ritov is Professor, Department of Statistics, The Hebrew University of Jerusalem, Mount Scopus, Jerusalem, 91905, Israel (e-mail: yaacov@mscc.huji.ac.il).