

## Early Learning in Bradley-Terry tournaments

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Zermelo in 1929 introduced Bradley-Terry model to evaluate the value of players using only pairwise comparisons between them. I'll consider this model in "random environment", i.e., when the values of the players are i.i.d. random variables. First, I'll discuss some results on the asymptotic probability that the best player (the one with the largest value) wins (ends up with the largest number of victories) when each pair met once and the number of players grows to infinity. Then, I'll explain why the distribution of the values can be estimated from the observation of the results of the games during only a few "days" of the tournament, using a loss of memory property. Finally, I'll present statistical perspectives for the "early learning problem" of recovering the strength of the players using an empirical Bayes estimator.