Using game-situation information and weather data for each field goal attempt during several recent NFL seasons, we attempt to identify the key factors in kicking success. To quantify their influence, we fit a multivariate model for the success probability of a particular field goal, if attempted by a generic NFL kicker. This leads to an intuitive metric for an individual kicker’s performance, based on the degree to which he exceeds (or falls short of) the expected aggregate result. In applying this metric, we explore the common belief that NFL kickers are mostly interchangeable. (Received September 25, 2012)