Karen S. Briggs* (kbriggs@math.ucsd.edu), Department of Mathematics, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0112, and Jeffrey B. Remmel, Department of Mathematics, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093-0112. A Rook Theory Model for \(p, q\)-Analogues of Hsu and Shiue’s Generalized Stirling Numbers. Preliminary report.

Using three complex parameters \(\alpha, \beta,\) and \(r\), Hsu and Shiue defined the generalized Stirling numbers of the first and second kind, respectively denoted \(S_{1,n,k}(\alpha, \beta, r)\) and \(S_{2,n,k}(\alpha, \beta, r)\). Based on two natural \(p, q\)-analogues for the falling factorial, Remmel and Wachs obtained two types of \(p, q\)-analogues of the Stirling numbers of the first and second kind; type I denoted \(S_{1,n,k}^{p,q}(\alpha, \beta, r)\), \(S_{2,n,k}^{p,q}(\alpha, \beta, r)\), and type II denoted \(\tilde{S}_{1,n,k}^{p,q}(\alpha, \beta, r)\), \(\tilde{S}_{2,n,k}^{p,q}(\alpha, \beta, r)\). Here, for nonnegative integers \(\alpha, \beta,\) and \(r,\) we define two rook theoretic models each based on a pair of rook placements on two boards. For a given “staircase board” with respect to each model, we show that the respective rook numbers yield combinatorial interpretations for \(S_{1,n,k}^{p,q}(\alpha, \beta, r)\) and \(\tilde{S}_{1,n,k}^{p,q}(\alpha, \beta, r)\). Further, we show that the two types of generalized \(p, q\)-Stirling numbers of the second kind are obtained by switching the roles of \(\alpha\) and \(\beta\) in our two models. (Received October 05, 2004)