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Howard S Cohl* (hcohl@nist.gov), Applied & Computational Mathematics Division, National Institute of Standards & Technology, Mission Viejo, CA 92694, and **Roberto S Costas-Santos**, **Philbert R. Hwang** and **Tanay V. Wakhare**. *Generalizations of generating functions for basic hypergeometric orthogonal polynomials.*

We derive generalized generating functions for basic hypergeometric orthogonal polynomials by applying connection relations with one free parameter to them. In particular, we generalize generating functions for Askey-Wilson, continuous q -ultraspherical/Rogers, little q -Laguerre/Wall, and q -Laguerre polynomials. Depending on what type of orthogonality these polynomials satisfy, we derive corresponding definite integrals, infinite series, bilateral infinite series, and q -integrals. Using the generating function for continuous q -ultraspherical/Rogers polynomials and a recent result by Ismail & Simonov, we derive corresponding generalized expansions for continuous q -Jacobi, Askey-Wilson and Wilson polynomials with two, four, and four free parameters respectively. The coefficients of these expansions are given in terms of ${}_8\phi_7$. Using the specialization of this analysis for continuous q -ultraspherical/Rogers polynomials, we derive a new quadratic transformation for basic hypergeometric series connecting ${}_2\phi_1$ and ${}_8\phi_7$. (Received August 31, 2017)