1083-34-55 **Lingju Kong*** (lingju-kong@utc.edu), Department of Mathematics, University of Tennessee at Chattanooga, Chattanooga, TN 37403, and **John R. Graef** (john-graef@utc.edu), Deparment of Mathematics, University of Tennessee at Chattanooga, Chattanooga, TN 37403. *Existence of positive solutions to a higher order singular boundary value problem with fractional q-derivatives.*

We study the singular boundary value problem with fractional q-derivatives

$$-(D_q^\nu u)(t) = f(t,u),\ t \in (0,1),$$

$$(D_q^i u)(0) = 0,\ i = 0,\dots,n-2, \quad (D_q u(1) = \sum_{j=1}^{m} a_j (D_q u)(t_j) + \lambda,$$

where $q \in (0,1)$, $m \geq 1$ and $n \geq 2$ are integers, $n-1 < \nu \leq n$, $\lambda \geq 0$ is a parameter, $f : [0,1] \times (0,\infty) \to [0,\infty)$ is continuous, $a_i \geq 0$ and $t_i \in (0,1)$ for $i = 1,\dots,m$, and D_q^ν is the q-derivative of Riemann-Liouville type of order ν. Sufficient conditions are obtained for the existence of positive solutions of the problem. Recent results in the literature are extended and improved. Our analysis is mainly based a nonlinear alternative of Leray-Schauder. (Received August 13, 2012)