Let $M$ be a (not necessarily semi-finite) von Neumann algebra. We prove that there exists a finite von Neumann algebra $N$ so that for $1 \leq q < p < 2$, $L^p(M)$ embeds isomorphically into $L^q(N)$ (as Banach spaces). The proof uses non-commutative generalizations of technics from r.i. function spaces and a non-commutative analogue of a classical result of Rosenthal on embedding reflexive subspaces of $L^1$-spaces into $L^p$-spaces. (Received January 31, 2006)