We give some results concerning the hyperinvariant subspaces, cyclic vectors and extended eigenvalues for the so-called Volterra composition operators and Hardy type operators defined, respectively, on the Lebesgue space $L^p(0,1)$ by

\[ V_{x^n}f(x) = \int_0^{x^n} f(t) \, dt \quad (n=1,2,...) \]

and

\[ H_{n,m}f(x) = \frac{1}{x^m} \int_0^{x^n} f(t) \, dt \]

where $n,m \in \mathbb{N}$ and $n > m$. We investigate these operators in the space of continuous functions on the segment $[0,1]$. 