In a sequence of four recent papers, it was eventually shown that the hyperinvariant-subspace lattice $\text{Hlat}(T)$ of an arbitrary nonalgebraic operator $T$ on Hilbert space is lattice-isomorphic to $\text{Hlat}(A)$ for some $A$ in a special class $(A_\theta)$ of operators. In this note, which might be regarded as a first step in an attempt to better understand the structure of the class $(A_\theta)$, we construct and study a certain subclass $(S_\theta)$ of this collection consisting of some operator-weighted bilateral shifts. (Received September 27, 2006)