ABSTRACT. Let T be an ergodic transformation of a nonatomic probability space, f an L_2-function, and $K \geq 1$ an integer. It is shown that there is another L_2-function g, such that the joint distribution of $T^i g$, $1 \leq i \leq K$, is nearly normal, and such that the corresponding inner products $(T^i f, T^j f)$ and $(T^i g, T^j g)$ are nearly the same for $1 \leq i, j \leq K$. This result can be used to give a simpler and more transparent proof of an important special case of an earlier theorem [1], which was a refinement of Bourgain's entropy theorem [2].

[1] M. Akcoglu, M.D. Ha, and R.L. Jones, *Sweeping-out properties of operator sequences*, Canad. J. Math. **49** (1997), 3–23.

[2] J. Bourgain, *Almost sure convergence and bounded entropy*, Israel J. Math. **63** (1988), 79–97.