Let $\mathcal{F} = \{f_i\}_{i \in I}$ be a family of measure preserving self maps on a measure space $\{X, \Sigma, \mu\}$, indexed by a finite set $I$. For a sequence $\alpha = a_1, a_2, \ldots$ with $a_i \in I$, the n-fold composition with respect to $\alpha$ is $F^n_\alpha = f_{a_n} \circ F^{n-1}_\alpha$. When the n-fold compositions from the family $\mathcal{F}$ take finitely many forms, we show the discrete time distribution for the orbit of $F^k_\alpha(x_0)$ is a weighted average of the discrete time distributions of the orbits of the finite forms at the point $x_0$ for $\mu$-almost all $x_0$ and for almost all $\alpha$. This weighted average is arrived at by showing that an independence condition holds by applying the Law of Large Numbers applied to a subsequence of the Radamacher functions. When the discrete time distributions of the finite forms are identical for $\mu$-almost all $x_0 \in X$ the weighted sum of the discrete time distributions reduces to the single valued distribution for any one of the finite forms. (Received September 21, 2010)