In the study of linear differential, difference, and dynamic equations or systems we can identify, among others, two substantial directions: the oscillation theory and the spectral theory. In the first one, roughly speaking, the numbers of zeros of real-valued solutions are investigated and a crucial role is played by the principal solution, which existence is equivalent to the nonoscillatory behavior. In the second one, associated operators are investigated and a crucial role is played by square integrable/summable complex-valued solutions. Especially, the square integrability/summability of the Weyl solution yields a lower bound for their number. In this talk, we show a close connection between the principal solution and the Weyl solution of the second order Sturm–Liouville dynamic equation

\[-[p(t) y^\Delta(t, \lambda)]^\Delta + q(t) y^\sigma(t, \lambda) = \lambda w(t) y^\sigma(t, \lambda), \quad t \in [a, \infty) \cap \mathbb{T}, \quad \text{(E)}\]

where \(\mathbb{T}\) is a time scale and the coefficients are real-valued. In addition, we present also further results concerning square integrable solutions of equation (E), which were derived by using the principal solution. Finally, we discuss a generalization of these results to linear Hamiltonian differential systems. (Received September 07, 2017)