This paper studies links between uniform pseudorandom sequences of real numbers in \([0, 1)\) and pseudorandom binary sequences. It is proved that good pseudorandom \([0, 1)\) sequences induce binary sequences that have small correlation and well-distribution measures. On the other hand, given a binary sequence with small combined well-distribution-correlation measure, it is shown how to construct a \([0, 1)\) sequence with small discrepancy. The special cases of linear congruential pseudorandom sequences and of Legendre symbol sequences are analyzed in more detail.