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Minimal dilation of quantum dynamical semigroups to semigroups of endomorphisms.

Quantum dynamical semigroups are one parameter semigroups of contractive completely positive maps on C^*-algebras. We show the existence of a canonical dilation of such semigroups to semigroups of endomorphisms (of C^*-algebras). This came from an effort to develop quantum boundary theory (joint work with K. R. Parthasarathy). The main theorem encompasses, generalises the Sz. Nagy-Foias dilation theorem for contractions, Stinespring's representation theorem for completely positive maps, and Kolmogorov's existence theorem for classical Markov processes. The method provides us with examples of continuous tensor product systems and E_0-semigroups of Arveson, Powers.