Abstract. If $X$ is a connected complex manifold with $d_X = 2$ that admits a (connected) Lie group $G$ acting transitively as a group of holomorphic transformations, then the action extends to an action of the complexification $\hat{G}$ of $G$ on $X$ except when either the unit disk in the complex plane or a strictly pseudoconcave homogeneous complex manifold is the base or fiber of some homogeneous fibration of $X$. 