Regular representations of finite groups via hypergraphs

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Given a regular action of a finite group $G$ on a set $V$, we ask the question of the existence of a hypergraph $\mathcal{H} = (V, \mathcal{B})$ on the set $V$ whose full automorphism group $\text{Aut}(\mathcal{H})$ is the group $G$ in its regular action. Using results on graphical and digraphical regular representations (Godsil, Watkins, Babai), we show the existence of a desired hypergraph for all but a finite list of finite groups.