1145-05-160 **Emelie J Curl*** (ecurl@iastate.edu), 205 South 5th Street, Apt. #705, Ames, IA 50010. *A Turán-type Problem in Finite Groups.*

Let G be a finite abelian group. Given $S, T \subseteq G$, $a \in G$, any set of the form $a + S = \{a\} + S$ is called a *translate* of S. A coloring of the elements of G is $S-$*polychromatic* if every translate of S contains an element of each color. The largest number of colors allowing an $S-$polychromatic coloring of the translates of S is known as the *polychromatic number* of S, denoted $p_G(S)$. Determining the polychromatic number of finite abelian groups is a relatively new and unexplored method that can be used to solve the following problem: What is the maximum number of elements in a subset of G which does not contain a translate of S? This type of problem called a Turán-type problem is common in extremal graph theory, but is new to the realm of algebra. The goal of this research is to determine bounds, using polychromatic colorings, on the desired maximum number of elements within the context of the well known abelian group the integers modulo n, denoted $\mathbb{Z}_n$ for all $n \geq 3$. This research also redefines and explores the problem within the context of nonabelian groups such as the dicyclic group, denoted Dic_n for all $n \geq 2$, and the dihedral group, denoted D_{2n} for all $n \geq 2$. (Received August 13, 2018)