A coprimality condition for consecutive values of polynomials

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Let $f \in \mathbb{Z}[x]$ be a quadratic or cubic polynomial. We prove that if k is large enough, then one can find infinitely many positive integers n such that among $f(n+1), f(n+2), \ldots, f(n+k)$ none is coprime to all the others. This extends previous results of Erdős, Pillai, Brauer and Evans concerning consecutive integers and linear polynomials.

Our proof relies on the properties of the Galois group of an auxiliary polynomial associated to f, theorems concerning density of primes and estimates on the number of large prime divisors of polynomial values. The result are joint with Carlo Sanna.