1056-Z1-735 **Brad Bailey*** (bbailey@ngcsu.edu), NGCSU Dep't. of Math & Computer Science, 82 College Circle, Dahlonega, GA 30597, and **Dianna J. Spence**. *Path elongation and r-reduced cutting numbers of cycles.*

For a positive integer r and an edge-wise disjoint collection of cycles, $\{C_i : 1 \leq I \leq n\}$, within a connected graph G, the r-reduced cutting number is the number of components of order at least r contained in the graph $G - \bigcup_{i=1}^{n} C_i$, while the cutting power of a graph is the smallest number of edge-wise disjoint cycles that have r-reduced cutting number greater than 1. We present a series of results calculating the maximum and minimum numbers of edges in graphs with order n and r-reduced cutting number k and establishing these values for some important families of graphs. We also introduce the notion of path elongation; for a pair of vertices, u and v within G, the path elongation for u and v relative C, is the length of shortest path from u to v within $G - -E(C)$ minus the length of the shortest path from u to v within G, or $dist(u, v, G) - -dist(u, v, G - E(C))$. We consider two possible definitions of the path elongation value for a graph G and show that they are equivalent. The path elongation value of a graph is related to the notion of a detour length, but can be demonstrated to differ from detour length. (Received September 16, 2009)