Introduction: The purpose of my study was to determine if rats with varying levels of inherent motivation to voluntarily run in wheels, when given no access to voluntary running wheels, would retain any protective affects against a Westernized diet.

Methods: A novel rat model was previously created in which rats were artificially selected with the putative motivation to produce high or low amounts of voluntary running each night (termed HVR and LVR, respectively). Also, a wild type group was added. Every Wistar rat was given zero access to voluntary running in a wheel and fed a specific diets for eight continuous weeks. A glucose tolerance test was performed at week seven and rats were sacrificed after eight weeks of dieting.

Results: Without access to running wheels, the metabolic markers of HVR and LVR rats tended to be worse metabolically than that of the WT line. In general, the two selected lines (HVR and LVR) appeared to be closer to a prediabetic-like state than WT.

Conclusion: These results suggest that, with no access to voluntary exercise in a wheel, the process of selective breeding for voluntary running likely co-selected genes that can be deleterious on their ability to minimize the negative health consequences of a Western diet. The translation of these results to humans suggests that individuals with a high motivation for voluntary physical activity see diminished health benefits in regards to their metabolic state if they do not exert this drive for daily exercise by partaking in voluntary physical activity.