A Quantitative Graphic Study and Wilcoxon Signed Rank Analysis To Determine If There Is a Significant Gender Difference in Summer Olympic Uniforms

Wagner, Olivia (School: H.H. Dow High School)

Different Olympic male and female uniform designs create many potential problems: feeling uncomfortable on international television, risk of body part exposure, and sexualization of the body and sport. The purpose of this novel study is to perform a quantitative assessment with objective data and statistical analysis to compare male and female USA Summer Olympic uniforms. In this way, one can objectively discover any actual gender bias, based on Uniform Surface Area. Computer software was used to normalize each picture and control for different-sized athletes and pictures. Differences in female and male bodies and pictures were standardized to trace intricate paths and calculate surface areas. The data represents uniforms from 7 different disciples, testing options for evaluation were explored. A Student's t-test was performed for comparison of each paired sport. Since the data is possibly nonparametric, and to explore all the sports as a group, a Wilcoxon Signed-Rank Analysis (WSRA) was also used to determine a significant difference between medians of all seven sports. In these sports, uniform coverage is between 30 to 50 percent less for women than men with normalized uniforms. The worst group was Running and Track, where women only have between 38-43 percent of a men’s surface area in the same sport. When matched pairs in Olympic uniforms were compared with a Student's t-test, the differences were significant ($p<.01$) across each sport. The Wilcoxon Signed-Rank Analysis showed the median difference to be significant across all sports, using a two-tailed $p=.05$. The purpose of this project was successful in a quantitative assessment using objective data and statistical analysis to study gender bias in the USA Summer Olympic Uniforms.

Awards Won:
Second Award of $2,000