

A Trend Analysis of the Proportion of Women in College Coaching

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The enactment of Title IX in 1972 resulted in the addition of numerous women's sports programs across the country. Thus, a plethora of opportunities for females of all ages wanting to participate in sport emerged, as high schools, colleges, and universities were required under federal law to provide fair and equitable athletic programs to both male and female students. The growth of participation opportunities has continued to flourish and in fact, recent data from Acosta and Carpenter (2006) reveal that across all three divisions of intercollegiate athletics, the number of teams offered per school, the total number of women's teams nationwide, and total female participation are at all-time highs. Despite such positive effects, however, the number of women occupying leadership positions within college sport has dramatically decreased since the passage of Title IX. For instance, prior to 1972, the year Title IX was enacted, over 90 percent of women's intercollegiate sports teams were coached by women. According to Acosta and Carpenter's (2006) most recent evaluation of intercollegiate athletic programs, the proportion of females occupying head coaching positions within intercollegiate athletics is at an all-time low. Recognition of the powerful effects, both positive and negative, experienced as a result of Title IX has served as the impetus for numerous inquiries into the identification of possible antecedents and causes as well as potential outcomes and implications for such effects (e.g. Cunningham et al., 2003; Knoppers et al., 1991; Lovett & Lowry, 1994; Sagas et al., 2000; Sartore & Cunningham, 2006). Inciting, aiding, and perhaps serving as a common denominator for the numerous investigations within this research agenda has been the data brought forth by researchers Linda Jean Carpenter and R. Vivian Acosta who, to date, have accumulated nearly thirty years of data representing the most comprehensive examination of women, at all levels, within intercollegiate athletics. However, despite the numerous citations of their data, as well as the data's immense contributions to the field, no study has set out to statistically verify the pattern of the observed data trends. Acknowledging this gap, the purpose of the current investigation was to examine the direction, magnitude, shape, and significance of the trends associated with participation opportunities for women within intercollegiate athletics, females as head coaches, and females as paid and unpaid assistant coaches. Such comparisons will perhaps provide a clearer picture for current and future sport management researchers to verify what has occurred, what is currently taking place, and what may be yet to come.

Data from the most recent Acosta and Carpenter (2006) report examining the years 1977-2006 were subjected to a trend analysis. All data were analyzed using an analysis of variance (ANOVA) procedure with the years that the data were collected serving as the independent variables and the data, in the form of means and percentages, serving as dependent variables. Upon initial examination of the data, it was determined that in order to remove the jagged appearance and more importantly, increase the stability of the rates, all data would need to be smoothed (Rosenberg, 1998). As such, the data for the participation opportunities and head coaching positions (i.e., study one) were collapsed across four larger time periods. These time periods included years 1977-1984, 1985-1991, 1992-1998, and 1999-2006. Available assistant and head coaching position data (i.e., study two) were collapsed into three time periods and partitioned as follows: 1998-2000, 2001-2003, and 2004-2006.

In the first study, it was hypothesized that there would be no significant differences in participation opportunities for women as evidenced by the average number of athletics teams offered at institutions; and there would be no significant differences in the percentage ratios of women as head coaches of women's athletics teams among four groupings of years between 1972 and 2006. Results from an ANOVA procedure revealed significant differences between the four time periods, $F(3, 24) = 71.18, p < .01, \eta^2 = .90$. Polynomial contrast results and estimated marginal means revealed a significant downward cubic pattern to the data, (contrast estimate = -1.945, $p < .01$). This trend shows a significant decrease, followed by a slight plateau and then another dramatic decrease. Results from an ANOVA procedure also revealed significant differences in the number of teams offered to women between the four groupings of years between 1977 and 2006, $F(3, 24) = 61.97, p < .01, \eta^2 = .89$. Similar to the trend found in the head coaching data, polynomial contrast results, (contrast estimate = .301, $p < .01$), and estimated marginal means revealed a significant cubic trend to the data. However, in stark contrast to the pattern exhibited by the coaching data, the cubic pattern for participation opportunities showed dramatic increases in the number of teams offered, followed by a plateau and then another increase that, upon observation, appeared to be the antithesis to the overwhelming decreases exhibited in the women's coaching data. Post-hoc multiple comparison tests substantiated both cubic patterns as well as revealed specific differences between time periods.

In the second study, it was hypothesized that there would be no significant differences in the percentage ratios of women as head coaches and women employed as paid assistant or volunteer assistant coaches of women's athletics teams among three groupings of years between 1998 and 2006. An ANOVA procedure showed significant differences between groups of years, F

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(2, 5) = 10.07, $p < .05$, $\eta^2 = .80$ for women in head coaching positions. Polynomial contrast results and estimated marginal means were linearly significant, (contrast estimate = -2.251, $p < .01$) and in a downward trajectory. Overall significant differences between four-year groupings were also found for both paid assistant coaches, $F(2, 5) = 8.39$, $p < .05$, $\eta^2 = .77$, and unpaid assistant coaches, $F(2, 5) = 10.54$, $p < .05$, $\eta^2 = .84$. Polynomial contrasts and estimated marginal means revealed a quadratic pattern for both paid (contrast estimate = 1.613, $p < .05$) and unpaid assistant coach (contrast estimate = 5.532, $p = .01$), data, respectively. Post-hoc analyses revealed specific differences.

As stated by Acosta and Carpenter (2006), the number of participation opportunities in terms of the number of teams offered to women within intercollegiate athletics was reportedly "the highest ever" (p. 14). Conversely, the representation of females as head coaches within women's intercollegiate athletics was reportedly at an "all-time low" (p. 15). Our results revealed a statistically significant upward trend for the participation opportunities afforded to women in intercollegiate athletics and a significant downward trend of the number of female head coaches of women's teams. Likewise, statistically significant decreases were demonstrated for both unpaid and paid female assistant coaches during specific time frames. These trends statistically verify the work and contentions of Acosta and Carpenter (2006), as well as allow for additional inquiry into the potential causes and influences for such patterns.