The purpose of this study is to introduce Rasch analysis as a methodological advance in sport management research. Specifically, the Rasch technique is illustrated through its application to an empirical investigation of college students’ perceived benefits from recreational sports participation. This study seeks to develop and calibrate sources of the Perceived Benefit Scale (PBS) for recreational sports participants at college level using the Rasch model. This research allows for the evaluation of the PBS instrument and the development of strategies that will facilitate college students’ continued recreational sport participation throughout their campus life.

The National Intramural-Recreational Sports Association (NIRSA) has long been concerned about developing programs and facilities that will promote sport, physical activity, and exercise for college students and university administrators (NIRSA, 2004). This concern has prompted substantial research pertaining to the impact of participation in recreational sport programs in college, with particular interest in the following benefits obtained through participation: 1) intellectual benefits (e.g., academic improvement, time management skills, and communication skills) (Belch et al., 2001; Bryant & Bradley, 1993; Bryant et al., 1994; Danbert et al., 2014; Smith & Thomas, 1989); 2) social benefits (e.g., ease of social integration, sense of belonging, and sense of community) (Artinger et al., 2006; Bryant et al., 1994; Christie & Dinham, 1991; Hall, 2006); and 3) health benefits (e.g., fitness, mental health, and healthy lifestyle choices) (Kanters, 2000; Lower et al., 2013; Ragheb & McKinney, 1983). One of the most consistent findings in recreational literature is that active participation in recreational sports positively influences the previously stated benefits, which ultimately leads to increases in student’s retention and satisfaction with their college experiences.

While the benefits achieved through sport, physical activity, and exercise are well-established in the literature, little attention has been paid to the development of relevant tools to assess benefits from recreational sport. Several studies have used their own modified set of questionnaires to measure students’ benefits or learning outcomes from recreation sport participation (NIRSA, 2010; The Ohio State University, 2003; Turman & Hendel, 2004), yet those instruments currently in use are strongly based on the classical test theory (CTT), constructed and validated through the traditional method that has suffered from psychometric disadvantages. Four main challenges in using the CTT approach are the difficulty levels of scaling items, nonadditive features of ordinal data, missing data treatment, and item category functioning (Bond & Fox, 2007).

In this study, we attempted to calibrate the Perceived Benefit Scale (PBS) and provide evidence for the validity of the instrument using the Rasch modeling approach (Bond & Fox, 2007). The Rasch calibration is an advanced technique which addresses the limitations of traditional validation works based on CTT, which is widely used in measurement practices (Rasch, 1960, 1980; Wright & Stone, 1979; Zhu, 1996). The data analyzed in this study were collected from a large public university from the Southwestern region of United States in the spring of 2014 (N = 940). The university campus recreation department developed a questionnaire which asked students to indicate the degree of perceived benefits (i.e., contributions and feelings of increased or improved) from recreational sport participation using 4-point Likert type scale ranging from 1 (not at all) to 4 (significantly). The WINSTEPS and SPSS software programs were used for a two-facet Rasch model.

Overall, the 15 items were in the acceptable range from 0.5 to 1.5 logits (0.64 < Infit < 1.44, 0.63 < Outfit < 1.47), indicating an appropriate fit. This finding provided the evidence of unidimensionality of the PBS that satisfied with the assumption of Rasch analysis. Cronbach’s alpha coefficient for the 15 items was .95.

The item measure of recreational sports benefits and the person measure of respondents’ degree of perceived benefits were calibrated through a common logic metric. In this Rasch analysis, the item measure indicates how likely
a benefit is to be endorsed, and the values ranged from -1.22 to 1.79 logits. A higher logit score of item measure indicates a less endorsed benefit. The item separation index was 15.04, which denotes that the recreational benefit items were well spread out within the instrument scale. The separation reliability was 1.00, which indicated that the instrument had a high confidence level in replicating placement of items within measurement errors for another sample (Fisher, 1992). The three most endorsed benefits that college students responded were “improvement of fitness level” (logit = -1.22), “contribution to the quality of life at the college” (logit = -1.04), and “increase of overall health” (logit = -1.03). The three least endorsed benefits were “improvement of leadership skills” (logit = 1.79), “contribution to the core values (e.g., learning, discovery, freedom, leadership, individual opportunity, responsibility) of this institution” (logit = 0.93), and “increased respect for others” (logit = 0.87).

The second component of the Rasch analysis is the person measure, which is a quantitative measure of a person’s attitude on a unidimensional scale. The degree of respondents’ perceived benefits ranged from -5.89 (less perceived benefits) to 6.09 (more perceived benefits) logits. A higher logit score on the person measure indicates a higher level of perceived benefit from recreational sport participation. The person separation index was 3.16, which is above 2.0, means that the respondents were well spread out along the scale. The person separation reliability was .91, where a number above .80 is considered as having high confidence levels in replicating placement of person within a measurement error.

Finally, rating scale functioning was also evaluated. The results of distribution of the observed counts, average measure, outfit statistics, and category thresholds satisfied the minimum criteria, indicating the four category rating scale functioned well. The Item-person map was also analyzed to evaluate how the items captured precise degrees of perceived benefits. The PBS items were appropriate for most of the respondents, but they do not provide content coverage on who has a higher or lower degree of benefit from recreational sport participation (i.e., located at logits >2 and <-1.2.)

Recreational sports affects millions of college students and administrators and has a substantial impact on their health, education, and school environment. Understanding the perceived benefits of recreational sport participation is essential in designing programs and activities to promote active participation among these populations. The application of the Rasch calibration addresses the shortcomings of traditional validation approach and allows for a better understanding of the benefits of recreational sport participation among college students. The results of this analysis provides both the ranking of the benefits and the perception levels of individuals that may contribute to program development and refinement as well as for the marketing of Rec Sports programs. The results also indicate that the PBS could be improved by adding more items to measure the population that was not differentiated within the current scale. While Rash analysis has gained a foothold in other disciplines, this study provides support for its utility in sport management research. Practical implications of measuring the perceived benefits of recreational participation and specific methodological advantages of the Rasch analysis will be further discussed.