Measurement Properties of Constraints to Sport Participation

Jonathan Casper, North Carolina State University  
Michael Kanters, North Carolina State University  
Jason Bocarro, North Carolina State University

Constraints to sport participation have an integral role in understanding consumer behavior. Research examining constraints to sport participation are common (e.g., Alexandris & Stodolska, 2004, Alexandris, Tsonbatzoudis, & Grouios, 2002; Hubbard & Mannell, 2001; Jun, Kyle, Mowen, 2008) and more recently constraint measures have been used in sport spectatorship studies (Casper, Kanters, & James, 2009; Prichard, Funk, & Alexandris, 2009). Despite an emerging body of research devoted to constraints, significant measurement issues still persist and warrant further examination. First, identifying and assessing constraints to participation requires instruments that are reliable, valid, and generalizable. Second, there has been an inconsistent reporting of constraint item/construct psychometrics. Third, longitudinal studies have not been conducted to assess consistency and reliability of these measures. Finally, non-participants have been largely neglected in the research. Given these issues, the purpose of the current study was to critically examine the psychometrics of a commonly used constraint scale that was assessed longitudinally with a large sample of adolescent children who are diverse both demographically and behaviorally.

Study participants (N = 2588; response rate = 95%) were recruited from four public middle schools in a southeastern United States city. A web-based survey was administered twice. The first collection took place about two weeks into the school year and the follow-up collection was conducted in May about two weeks prior to the conclusion of the school year.

The constraints measure used in this study were derived from items used in seminal constraint research (e.g., Alexandris & Carrol, 1997a) and was modified to reflect wording relevant to youth sports (e.g., sport in general versus specified leisure activity). The items covered each of the three basic constraint constructs: intrapersonal, interpersonal, and structural constraints. Specifically the 25 items scale represented seven factors: facility accessibility, facility cleanliness, interest, psychological, social support/partners, and time. Respondents were asked if each of the constraint items stopped them from playing more sports. Each item was measured on a 5-point Likert-type scale indicating level of agreement ranging from 1 (not at all) to 5 (all the time). Initial analysis included frequencies, means, standard deviations, and normality. Individual subgroups were then separated and compared based on responses for sex, race, and parent’s socioeconomic status (if they received a free/reduced price lunch). Sport participation and non-sport participation were categorized based on respondents’ answer to playing sport previously (“Have you ever played sports?”). Exploratory factor analysis (EFA) was run to investigate factorial validity, while a confirmatory factor analysis (CFA) was conducted to assess construct validity. Lastly, measurement invariance tests based on changes in chi-square and changes in fit indices with an unconstrained model were conducted to test the factorial structure underlying constraints (e.g., whether responses have the same meaning for boys and girls, based on grades level, etc.).

For both the fall and spring collections, all items were found to have normal distribution. An EFA provided a four factor solution for both collection periods. The first factor included accessibility, knowledge and social items. The second factor included all the interpersonal and interest items. The third factor included time constraints items, while the final retained factor included facility items. A total of 49.00% of the variance was accounted for by the four factors in the fall data and 52.45% in the spring collection. All factor loadings were above .40 and no cross-loadings were present.

CFA tests of model fit based on each category provided evidence that the data acceptably fits the model in most of the categories with most of the fit indices (CFI, TLI, NFI, NNFI, and RMSEA). While some of the fit indices did not meet cut-off criteria (Hu & Bentler, 1999), at least two did meet the acceptable cut-off value. The only category that showed poor fit both in the fall and spring collection, was respondents that did not play sport. The fit indices for non-sport respondents were lower than the acceptable cut-off criteria which indicted the data did not fit the model.
A baseline, unconstrained model, tested invariance of the constraints based on factor loadings. The factor loadings were found to be non-invariant between the fall and spring data collection. The fall data showed some evidence for non-invariance between genders, with 7th graders compared to 6th and 8th graders, and with white students compared to blacks and Hispanics, and lastly based on income. Similar to the fall, the spring data collection comparisons had significant chi-square changes between 7th graders and 6th graders, but 8th graders did not differ with the 7th graders as found in the fall. Also similar to the fall collection, factor loadings were non-invariant with white respondents compared to the two other races and also based on income (i.e., low income compared to high income was non-invariant).

The current study was the first to critically examine the measurement properties of constraints by investigating equivalence across groups. The findings suggest that the constraint measure may be unique to the population under study as the EFA differed when compared to results of previous research with adults (e.g., Alexandris et al., 2002; 2003; Shores, Scott, & Floyd, 2007). The individual items related to each construct were found to be very good and showed strong internal consistency and construct validity. An examination of the data fit indicated that the constraints measure may not be appropriate for non-sport participants and may only be valid for those that have played sports. Also, invariance tests indicate that some groups interpret the items differently (e.g., variations in income, grade level/age, race, sex, and over time). These findings suggest that thorough psychometric testing when comparing demographic or behavioral groups may be needed in future studies utilizing the constraints measure and that assumptions should not be made about equivalence between groups.