Are Sport Consumers the Same? Test for Factorial Invariance on Spectator Motivation between Wheelchair Basketball Fans and Basketball Fans

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Group comparison research is useful in sport marketing because group variables can provide basic information for market segmentation (Shank, 2009). In the case of group comparison, from a methodological standpoint, it is important to assume that the items measuring constructs operate equivalently across groups that are compared. Schmitt and Kuljanin (2008) stressed the importance of establishing measurement invariance by stating that “unless measurement invariance is established, conducting cross-group comparisons of mean differences or other structural parameters is meaningless” (p. 210). According to Meredith (1993), establishing metric invariance (i.e., having equivalent factor loadings across groups) is a minimum requirement for the test of mean comparison in observed score across groups. In testing for multi-group factorial invariance, the following three tests are commonly adopted by researchers: (a) whether factor loadings across groups are equivalent (b) whether factor covariances are equivalent across groups, and (c) whether structural relations among the latent constructs are invariant across groups (i.e., the case of a structural model). Jöreskog (1971) further suggested testing for the equality of error variance and covariance across groups. However, it has been argued that the above test is considered to be too stringent except for the rare occasions where error variance and covariance could provide useful information to better understand a studied phenomenon (e.g., a longitudinal study and pre and post experimental analysis).

In sport marketing studies, understanding group differences has been widely conducted by taking the forms of gender comparison (Fink, Trail, & Anderson, 2002; Trail, Robinson, & Kim, 2008), cross-cultural comparison (Kim, Andrew, & Greenwell, 2009; Won & Kitamura, 2007), race/ethnicity comparison (Armstrong & Peretto-Stratta, 2004), and fanship comparison (Robinson, Trail, Dick, & Gillentine, 2005). Although these multi-group studies provided useful information to understand sport consumption behavior, mere comparison of groups without imposing equality constraints for the parameters of interest (e.g., factor loadings) across the groups may provide misleading results regarding group similarities and differences (Jöreskog, 1971). Byrne (2009) suggested “sometimes the null hypothesis is found to be tenable, yet subsequent tests of hypotheses related to the equivalence of particular measurement must be rejected” (p. 199). After a review of sport marketing literature, to date, there have been no such practices in cross-group comparison studies. To fill this void, the purpose of this study was to examine whether spectator motivation for game attendance is equivalent across two different sporting events (i.e., wheelchair basketball events and basketball events). To accomplish the objective, we adopted Trail and James’ (2001) Motivation Scale for Sport Consumption (MSSC) to measure spectator motivation. Testing for factorial invariance was conducted utilizing multigroup confirmatory factor analysis. The comparison of spectator motivation using the MSSC between the two contexts was rationalized for two reasons: (a) the MSSC has been found to have good explanatory power in various contexts, including intercollegiate sport settings (Robinson et al., 2005; Trail, Robinson, Gillentine, & Dick, 2003) and (b) Byon, Cottingham, Grady, Mohn, and Carroll (2009) examined the factor stability and utility of the MSSC in spectators of wheelchair basketball games and found a good model fit to the data as well as good magnitude of the parameters. This led to the following research hypothesis:

H1: factor loadings for MSSC will operate equivalently across spectators of wheelchair basketball events and basketball events.

For the purpose of this study, we tested only metric invariance (i.e., invariant factor loadings), which is considered to be a minimum requirement for mean group comparison (Meredith, 1993).

The study participants (n = 185) for wheelchair basketball events were drawn from three games of men’s and three games of women’s college wheelchair basketball at a large university located in the Southeastern U.S. The
respondents for basketball events were recruited from spectators \( n = 121 \) of one game of men's and one game of women's college basketball at a large university located in the Southeastern U.S. To measure spectator motivation, we used Trail and James's (2001) MSSC. Trail and James originally proposed nine factors, but in the current study only seven factors were used that included achievement, knowledge, aesthetics, drama, escape, physical skill, and social interaction. The two factors, family and physical attraction were excluded due to event organizer's request (i.e., physical attraction) and theoretical redundancy (i.e., family) with the social interaction factor. All seven factors were measured on a 7-point Likert scale, ranging from 1 = Strongly Disagree to 7 = Strongly Agree.

AMOS 7.0 (Arbuckle, 2006) was utilized to test for the factorial invariance of the MSSC across the groups. In order to assess the model, we adopted Jöreskog's (1971) \( \chi^2 \) difference test and Cheung and Rensvold's (2002) test of change in CFI value. For the \( \chi^2 \) difference test, evidence of invariance is established if the difference is not statistically significant. If the \( \chi^2 \) difference test revealed that there was a statistically significant difference, more restrictive subsequent tests should be conducted to identify the source of inequivalence. Relatively recently, Cheung and Rensvold proposed that model invariance is evidenced if a change in CFI values is less than .01.

To establish the metric invariance, Jöreskog (1971) suggested that two conditions must be met: (a) good model fit for groups and (b) good model fit for a configural model (i.e., pooled data). To test the assumptions, we conducted separate CFAs for the wheelchair basketball data and basketball data to examine the assumption for the configural model (i.e., unconstrained model, in which no equality constraints are imposed on any parameters). Consistent with the previous findings, the model for the both groups fit the data well, leading to testing for a configural model (i.e., baseline model). Examined by multiple model fit indexes, the configural model fit the data moderately well, \( \chi^2(336) = 714.84, \text{CFI} = .904, \text{and RMSEA} = .061 (CI = .055 - .067) \). Having satisfied the configural model (i.e., unconstrained model), it was appropriate to proceed with examining the metric invariance (i.e., invariance of factor loadings), which was the prime importance of this study. The constrained model also fit the data moderately well, \( \chi^2(357) = 744.52, \text{CFI} = .901, \text{and RMSEA} = .060 (CI = .054 - .066) \). The \( \chi^2 \) difference test was not significant, \( \Delta \chi^2(21) = 29.68, p > .05 \), and the change in CFI was .003, which was well below the suggested criterion of .01. Both of tests provided evidence of model invariance across wheelchair basketball and basketball settings.

Overall, the present investigation was, to our knowledge, the first attempt to examine the cross-group difference of measurement model via an invariance test in the context of sport marketing. Based on our findings, the MSSC model can be applicable to wheelchair basketball and basketball contexts, pending further research of more stringent invariance tests. According to Meredith (1993) and Steenkamp and Baumgartner (1998), metric invariance is considered a minimum invariance test (called weak invariance test). To establish a more robust invariant model, the model should have scalar invariance (i.e., invariant intercepts for the observed variable to test latent mean structure) and strict factorial invariance test (i.e., invariance of error variances). A further discussion on testing for invariance of structural relations between spectator motivation and behavioral intentions will be discussed in this presentation.

Selected Reference Pages


