Cross Validity and Factorial Validity of the Expanded Soccer Attacking Skill Scale (SASS)

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Abstract

The purpose of this study was to examine the factorial validity and cross validity of an expanded soccer attacking skill scale (Expanded SASS) measured by the location of players in soccer games using multiple-group analysis by structural equation modeling. The samples were 388 attacking performances in the final of the FIFA World Cup Korea/Japan 2002$^{TM}$, the final of the 27th all Japan University Prime Minister’s Cup, and the final of the 18th Japan Club Youth Football Championship which were measured by five-point interval scales by distance, and number of players. From the result of confirmatory factor analysis (CFA) that was constructed using one of the samples that were randomly split into two groups, the same model as was used in a previous study, except for an addition of correlated uniqueness, was accepted. The result of cross-validation by the other sample accepted the model with equality constraints of all parameters across samples. These results confirmed that the Expanded SASS was highly cross-validated. Nevertheless, there were two items that were interpreted as low factor loading; therefore, we need to add evidence of validity according to the intended use of the Expanded SASS.

Key words: Structural equation modeling, confirmatory factor analysis, multiple-group analysis, team skills

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1. Introduction

In order to design training programs that meet team performance goals, it is essential to ascertain team skill through the objective measurement of game performance. However, analysis of game performance until now has been limited to description and has failed to yield factorial explanations of game performance (e.g. Hughes, 1996). Therefore, the evaluation of team skill reflected in training programs has depended on the subjective judgment of coaches (Hughes & Franks, 1997).

From the viewpoint of training, methods used in the evaluation of team skills should be objective, rather than the subjective methods employed by coaches and specialists, and standardized for use by coaches. Hughes & Bartlett (2002) described the need to develop multidimensional qualitative indicators that are recognized by managers and coaches. In other words, in order to develop the indicators to measure overall team skill through performance, we need to clarify the structure of game performances that are recognized by coaches and specialists from the factorial viewpoint and identify the causal correlation of each factor.

The Soccer Attacking Skill Scale (SASS) developed by Suzuki & Nishijima (2002) is an indicator that satisfies the above-mentioned conditions. SASS evaluates attacking skill directly from performance in soccer games. Suzuki and Nishijima examined the reliability and factorial validity of this scale and confirmed the validity of 8 measurement items that explain 3 techniques associated with the attacking phase.

However, in conventional game performance analysis, attacking performances measured by SASS are limited to performances in which the last pass was kicked, regardless of whether shooting was attempted, and the ball is surrendered to the defending side. Therefore, during games hypothesizing that an attack has begun, the creating-space phase and the launching-of-attack phase are present, but attacking performances that fail to reach the breaking-up-defense phase were excluded.

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