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Factor structure of situational decision-making ability in basic face-up situations in basketball games

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## Introduction

In a basketball game, it is important to have the ability to assess the situation in order to instantly select the best play for the situation. The ability to make decision-making momentarily is naturally based on knowledge prior to games. Moreover, it is thought that not all individual situational judgments are made independently, but that there are some common situational judgment abilities underscoring these judgments that have been cultivated through experience and other factors. Therefore, this study aimed to examine the factor structure of the situational judgment ability in basic face-up situations, which is most often found in basketball games.

## Methods

Eighty-one coaches were asked to answer the situational decision-making ability test in basic face-up situations, consisting of 68 questions developed by Oyama, et al. (2023). The test was conducted using an online test format (Google Forms). The scoring was based on the frequencies that the 16 coaches with advanced level S through B certifications chose as the correct answer, and the frequency as a score was given to the respondent who chose that option. Factor analysis was performed on the results of the scoring of that test to obtain the factor structure. Incomplete Principal Component analysis method was used for factor analysis, and the number of factors with a cumulative contribution of $50 \%$ or more was employed, followed by an orthogonal solution by Normal Varimax rotation.

## Results

As a result, six factors were extracted showing a cumulative contribution rate of $50.52 \%$. Factor 1 showed significant factor patterns for 13 items, including "Cognitive ability in attacking with a counter (factor pattern = $0.523)$ ". Since these are all composed of cognitive ability, we interpreted this factor as "F1: Ability in recognizing a situation." Factor 2 showed significant factor patterns for seven items, including "Ability with prediction and decision-making when attaching the gap using driving and kicking (0.505)." Since these are composed of abilities related to drives, which are temporary numerical superiority situations, we interpreted this factor as "F2: Prediction and decision-making ability in momentary numerical superiority situations". In the same way, Factors 3 to 6 were interpreted as "F3: Prediction and decision-making ability before and after receiving a pass;" "F4: Prediction and decision-making ability in closed-out situations with the ball carrier;" "F5: Prediction and decision-making ability in facing-up and off-ball situations;" and "F6: Prediction and decision-making ability in driving situations with the ball carrier," respectively. In other words, the decision-making abilities in basic face-up situations in a basketball game consist of six factors, comprising one cognition and five prediction and decision-making abilities, with greater involvement of prediction and decision-making in the second half than cognition in the first half.

