

Advancing Softball Batting Performance Assessment: Validating Go/Nogo Reaction Time Perceptual Decision-Making Test

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Making quick and correct decisions is essential for the performance of softball and baseball hitters. Young athletes frequently struggle with decision-making as a result of an emphasis on swing force over reaction time abilities. The purpose of this study was to validate a Go/NoGo Reaction Time Perceptual Decision-making test. The researchers created a test to evaluate players' decision-making skills based on their recognition reaction time. The study utilized an embedded mixed-method design to analyze the test's content validity, known-group validity, and reliability by combining qualitative and quantitative methodologies. Specific participant criteria were established for each group: the first group included two Physical Education (PE) professionals (one male and one female) and a softball coach for peer review, the second group included ten PE professionals and coaches for content validation, and 60 participants, including 30 male and female PE students, and 30 male and female softball athletes, were selected for the known-group validity and internal consistency assessment. The study's encouraging outcomes demonstrate the test's relevance and timeliness in sports research. Positive response from Physical Education specialists verified its effectiveness in testing perceptual decision-making skills, with a content validity rating of 1.00. The test also demonstrated known-group validity by distinguishing between the decision-making abilities of PE students and athletes (Mann-Whitney U Test: $W=823$, $p<0.001$, $ES=0.829$). As indicated by the Kuder-Richardson 21 reliability coefficient (0.603), the internal consistency reliability was moderate, indicating consistent measurements over several trials with consistent difficulty. In conclusion, the Go/NoGo Reaction Time Perceptual Decision-making Skill Test has evolved as a valid and reliable instrument for measuring softball hitting decision-making skills, helping both athletes and non-athletes make better judgments throughout the game, identify areas for improvement, and develop individualized training plans, and marking a substantial development in sports performance evaluation, addressing a methodological gap in strengthening softball and baseball players' decision-making skills.

Keywords: Content Validity, Go/Nogo Reaction Time, Known-Group Validity, Internal Consistency Reliability, Perceptual Decision-Making