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Context and Cognitive Load in Anticipation Skill: A Novel Application of Cognitive Load Theory

Oliver R. Runswick¹, André Roca¹, A. Mark Williams², Neil E. Bezodis³, Allistair McRobert⁴, Jamie S. North¹

¹ Expert Performance and Skill Acquisition Research Group, School of Sport, Health and Applied Science, St Mary's University, Twickenham, London, UK

² Department of Health, Kinesiology and Recreation, College of Health, The University of Utah, UTAH, USA

³ Applied Sports Technology Exercise and Medicine Research Centre, Swansea University, UK

⁴ Research Institute for Sport and Exercise Sciences, Liverpool John Moores University, UK

The ability to anticipate is essential when performing under severe time constraints. Sports performers use kinematic information from opponents' movements and contextual information (e.g., score, field positions) to facilitate anticipation. We test predictions of Cognitive Load Theory (CLT; Sweller, 1988), which has rarely been applied to perceptual-cognitive skill, to investigate the relative importance of these two information sources and explore how context may affect cognitive load in different performers. Nine skilled and nine novice cricket batters faced bowlers on a life-size screen in four conditions that manipulated access to context and a secondary task. Trials were occluded immediately prior to ball release and anticipation accuracy was measured from scaled predictions of ball location (McRobert et al., 2009). Secondary task performance, verbal reports, and mental effort scores were recorded. Skilled batters showed better anticipation accuracy ($p < 0.05$) and both groups performed better with context ($p < 0.05$). In dual task conditions, both groups showed an increase in mental effort scores but improved anticipation accuracy (both $p < 0.05$), while secondary task performance was maintained ($p > 0.05$). Verbal reports revealed both groups relied upon kinematic information in the absence of context. When context was provided, skilled performers reported statements relating to sequencing and game information in addition to kinematic information, while both groups reported using information concerning opponent positioning. Findings add to the understanding of the role context plays in skilled anticipation and suggest that CLT may not apply to performance in dynamic perceptual-cognitive skills.