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A Perceptual Approach to the Transfer of Skill: Quiet Eye as an Insight into Perception-Action Coupling in Elite Football Goalkeepers – Methodological and Feasibility Considerations

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Rationale and Aims

About the continued theorist's and objective-epistemological approach to perceptual research (Bridwell & Bae, 1999), there remains little clarity regarding what information athletes use to direct decision-making in performance within performance. As a result, it is important to understand how the quiet eye (QE) is operationalized to enhance performance. Despite the importance of the QE, there have been limited studies that offer insight into the mechanisms by which it is operationalized. This focus on a QE is important to potential practitioners and those engaged in the critical study of QE's role in sport (Vickers, 2016). This is highlighted by Davids and Araujo (2010), who assert that the QE is important in guiding performance. However, Davids and Araujo (2010) state that the QE is important in guiding performance. Additionally, Davids and Araujo (2010) state that the QE is important in guiding performance.

The Infinite Variable and Beyond

There is a requirement to view the QE beyond an isolated and interventional approach, for which the QE could become used as a key perceptual tool to measure the transfer of skill from training to competitive performance (Reinhoff et al., 2015). However, given the critical role of the QE in guiding performance, there is a need for a more comprehensive understanding of the mechanisms by which the QE is operationalized. This comprehensive understanding is important for potential practitioners and those engaged in the critical study of QE's role in sport (Vickers, 2016). This is highlighted by Davids and Araujo (2010), who assert that the QE is important in guiding performance. However, Davids and Araujo (2010) state that the QE is important in guiding performance.

The QE is defined as the final fixation towards a specific location or object within 3° of visual angle or less for a minimum of 100m/s (p. 4) Vickers (2016)

Considerations and Critical Questions

It is worth noting that individual players may possess variable in eye movements and not follow optimum patterns for which they have usually been the case in perceptual based research (Davids and Araujo, 2010). However, when looking at averaged gaze behaviour across experiments, rather than assuming optimum patterns across individuals, we believe that inter-individual variation does not play an important role.

If a skill environment from the continuum is too close to the simulated game (in regards to high variability) then similar patterns will emerge naturally due to the task dynamics. Within this environment players may remain relatively identical in nature of the QE, but it may not be optimum for athletes to attend to the relevant invariants, not demonstrating learning, but a response to the perceptual dynamics that gain feedback (Friston, 2015, Bridwell and Raftery, 2014).

The provision of elite sport is often resourceful to manage and organize due to the huge temporal and financial constraints imposed on elite sport programmes. Research reflects this fully demonstrated the difficulties of management schedules, dealing with changes in staff, injuries, as well as well of form and cultural suppositions.

Proposed Methodology

4 Elite goalkeepers will use SMI-ETG (Eye Tracking Glasses) in 4 training environments to locate the QE under an emerging number of constraints that create opportunities for action (Newcomb et al., 2015, Wilson, 2017). The task will be evaluated via a cortical measure (representative match simulation (313-115), which will be assessed against 3 different points on the Environment Design Continuum (Newcombe et al. in preparation).

Training environments will be defined following principles of environment design as described in Newcombe et al. (in review) [Fig 1]

- Trial 1 – Practice Opposed
- Trial 2 – Practice Vacant
- Trial 3 – Small-Sided Game
- Trial 4 – Representative Competition 11 v 11

Each Goalkeeper will perform 10 interference actions per training environment over a 6 week period with video footage from the SMI-ETG and an external camera to capture the skilled action will be collected. The video will be clipped and manually coded (Via Sportcode Gamewraps, BeGaze from trainsys and VQA analysis tool from Quieteyesolutions.com) to establish the start and end of each skilled action.

QE duration: Trial 2 (1.2 - 3.0 s) brackets = saved actions – factorial ANOVA
QE location: Descriptive statistical analysis
Level of fidelity: Mean QE duration (Trial 1 or 2) x Mean QE duration Trial 4 x QE location – factorial ANOVA (Piras and Vickers, 2011).

Variation judged via an effect size measure. The trial with the smallest effect size will be determined as the one with the highest level of fidelity to that competitive performance.