A visual manipulation used to examine the neural processing underpinning skilled interceptive actions

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Coupled interceptive actions are understood to be the result of neural processing - and visual information - which is distinct from that used for uncoupled perceptual responses. To date, the majority of studies examining skilled interception have relied on uncoupled perceptual responses; as a result it has been suggested that our current knowledge of the neural processes underpinning skilled interception is somewhat limited and biased (van der Kamp, Rivas, van Doorn, & Savelsbergh, 2008). Based on the distribution of the human visual pathways, it is understood that perceptual-cognitive responses produced by the ventral pathway rely on visual information of better quality than the relatively blurred information used for online interceptive responses produced by the dorsal pathway. As a result it was hypothesised that low levels of visual blur would adversely affect a coupled response, but not an uncoupled one. To examine the visual information used for action and perception, skilled cricket batters anticipated the direction of balls bowled towards them using a coupled hitting movement and an uncoupled verbal response in each of four different visual blur conditions (plano, 1.00, 2.00, 3.00). When anticipating outcomes with habitual (unblurred) vision, coupled responses were found to be more accurate than uncoupled ones ($p < .01$), highlighting the importance of the relationship between perception and action when seeking to examine perceptual-motor skills. ANOVA testing revealed a significant interaction between coupling and blur ($F(3,18) = 3.70$, $p < .05$). Low levels of visual blur did not affect coupled anticipation, a finding consistent with the relatively poorer visual information which online interceptive actions are proposed to rely on. In contrast, evidence was found to suggest that low levels of blur may enhance the uncoupled (verbal) perception of movement. This rather counterintuitive finding is considered in light of other psychological studies which have reported enhanced movement perception with the introduction of visual blur.

The effect of visual distractors on anticipatory actions

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People must interact with moving objects on a daily basis while being bombarded by potentially irrelevant sensorial information. Empirical evidence shows that inattention can have serious consequences on peoples performance. Frequently, even though people are attentive to the task being performed (or to-be-performed), they are distracted by irrelevant visual stimuli in the environment. This study aimed to determine whether and when a to-be-ignored visual stimulus could disrupt performance in an anticipatory timing task. In Experiment 1, the participants were instructed to move their fingers in synchrony with the arrival of a moving object at a predetermined contact point on a monitor screen. On 15% of the trials, distractors appeared on the screen (beside the contact point) and the participants were instructed to ignore this event and perform the task as accurately as possible. The distractors appeared on the screen for 140 ms at various times prior to the arrival of the moving object at the contact point (-70 to -490ms). The results showed that the variable temporal error was greater than in control trials only when the visual distractor appeared 210 ms prior to the expected movement onset time (MOT). In Experiment 2, we varied the position of the