THE EFFECT OF PRACTICE CONTEXTUAL INTERFERENCE LEVEL ON GOLF SHORT GAME PERFORMANCE

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Introduction

Manipulating the structure of practice by switching between movement tasks creates contextual interference (CI), this is the interference between the motor preparation for each task created by the switching. Sequential repetition of the same task in practice (chip, chip, chip, chip, pitch, pitch, pitch, pitch), creates a low CI practice compared to a more random structure which leads to a higher CI practice (chip, pitch, chip, chip, pitch, chip, pitch, pitch). Considerable work in both sport and laboratory movement tasks suggests that a high CI random structure to tasks in practice is superior for skill learning compared to a low CI or commonly terms blocked structure. Research has found that random practice can lead to greater increases in performance in golf chipping (e.g. Aiken & Genter, 2018) but many of these studies have not measured the level of CI used, have used novice rather than experienced golfers, or have not been carried out in ecologically valid settings (lab *c.f.* golf facility). The current study sought to address these issues by measuring the CI level of practice, using experienced golfers and a naturalistic golf setting.

Methods

Following ethical approval, a between groups repeated measures design was used to assess the effect of differing levels of CI on golf short game performance. After providing written informed consent participants (n=36) completed a golf short game performance test modified from Pelz (2000). Performance was measured by the proximity of the finishing location of the ball to the hole, with points awarded in 1-foot increments with 16 points for holing out and 0 points for shots over 15-feet from the hole. Participants were randomly assigned to one of three CI groups (High n=12, Medium n=10, Low n=9). Participants completed 10 practice sessions, before a post-test 48 hours after the last session and a retention test 5-7 days after this. Each practice sessions consisted of 50 short game shots with the 50 shots being made up of 5 shot types that were each repeated 10 times. The order of shots in a session was structured using an algorithm to create different levels of CI for each group. CI for each session, measured according to Farrow and Buszard (2017), fell in the following ranges: Low 0.1-0.3, Medium 0.5-0.7, High >0.9. Proximity to the hole was measured on the tenth shot of each shot type in a session. Testing and practice took place outdoors on the short game practice area of a local golf club. Participants used their own golf clubs and were free to select the club that they deemed most appropriate for the shot that they were playing. Practice and testing were carried out using Titleist Pro V1 golf balls. Performance test data were analysed using a 3 (test) x 3 (group) mixed factorial ANOVA. Where significant differences were found post-hoc Tukey tests were used to identify individual pairwise differences.

Results and Discussion

31 of the 36 participants completed the testing and practice sessions. A significant main effect of test was found ($F(2) = 6.9$, $p = .002$, $\eta^2 = .06$) This was reflected in all groups increasing their scores in the performance tests after practice, post-hoc tests (Tukey) showed significant differences existed between the pre compared to the post ($p=.005$) and retention tests ($p= .02$). There was no main effect of group ($F(2) = 2.8$, $p= .08$, $\eta^2 = .11$) nor an interaction effect between test and group ($F(4) = .42$, $p= .80$, $\eta^2 = .001$).

The lack of significant differences in the performance improvement between groups calls into question the use of higher CI practice in experienced golfers. These findings differ from Aiken and Genter (2018) who have shown that random practice in beginners learning to chip lead to improved learning, however this was found using a performance test with random shot order rather than the blocked design here. As well as these golfers being skilled compared to Aiken and Genter's (2018) beginners, a further possible explanation for the current findings is that the difficulty level of the skills used was high and that this resulted in the functional task difficulty being too high for some of the golfers leading to practice being too challenging and that this reduced the potential benefit of higher CI (Guadagnoli & Lee, 2004). The current work shows that golfers can improve their short game performance using practice with a task structure leading to low, medium, or high CI. Further work is needed in this area to understand the role of practice task structure and functional difficulty in refinement of performance.

Significance

In skilled golfers short game performance can be improved through low, medium, or high levels of CI in practice but further work is needed to explore this. Coaches should be mindful of the difficulty of tasks used in practice in relation to skill ability and develop approached to assess the challenge or difficulty of practice so that it can be optimized for an individual.

References

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