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RESEARCH ARTICLE

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EFFECT OF GOAL DIFFICULTY ON LEARNING OF THE VOLLEYBALL SERVE

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ABSTRACT

The objective of this study was to evaluate the effect of the goal difficulty level in the learning of the volleyball serve, in both precision and the movement pattern. Ten adolescents (13 to 15 years old) inexperienced participated in this study. The dependent variables were accuracy to target and movement pattern of serve. The experiment was composed of three phases: pretest, acquisition phase, and retention test. The results demonstrated higher effectiveness of difficult goal for improve accuracy to target as well as in the movement pattern in comparison with easy goal. Perhaps, easy goals are not able of provide sufficient motivation for individuals with high competence in compare with difficult goals. This occurs because individuals with high self-efficacy are unlikely to choose or commit to less challenging goals. The current results support the predictions of Locke and Latham in opposite to some studies that investigated the effect of goal difficulty in sports skills learning. The study goes beyond because also assesses the movement pattern of the skill, it that can explain the lack of differences in the previous studies that used sport skills.

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INTRODUCTION

In the process of learning sports skills is possible to observe individuals who behave in different ways to meet the specific demands of the task. This occurs not only due to individual differences in motor proficiency level but also to motivational aspects. Schmidt and Lee (2005) argue that highly motivated people strive more in the practice of tasks with greater attention and devote more time to learning sessions. Among the factors that can increase the motivation level of the performers, the setting of specific and challenging goal has been cited as an able strategy to increase the performance of individuals (Locke & Latham, 2006). Although the goal setting strategies have emerged in the industrial and organizational psychology (Locke & Latham, 1985), some studies have investigated their effect on the sport context (Boyce *et al.*, 2001; Mellalieu *et al.*, 2006; Wack *et al.*, 2014). Among the attributes of goals setting that has been investigated in sports performance are the degree of goal difficulty, goal temporality, collectivity, and specificity of the goal (Burton, 1994).

Regarding the level of goal difficulty, Locke (Locke, 1991) argues that more difficult goal (if it is attainable) are associated with greater effort and persistence to achieve them, which can result in better performance. This behavior has been observed in some studies using tasks that involve endurance (Bar-Eli, Tenenbaum, Pie, Btesh, & Almog, 1997; Tenenbaum, Pinchas, Elbaz, Bar-eli, & Weinberg, 1991), but in learning sports skills the effect of goal difficulty level is still inconclusive (Lane & Streeter, 2003; Marinho *et al.*, 2009; Mooney & Mutrie, 2000). In a review, Kyllö and Landers (1995) observed a greater effect of the moderate level of difficulty compared to the easy and hard goal.

A possible matter that can influence the effect of goals setting can be related to the individual's learning stage in a given task (Corrêa *et al.*, 2006), because the first attempts to execute a skill are characterized by absence of consistent movement pattern. Although quantitative characteristic of the goal used in the studies that have investigated the effect of the goal difficulty, it is possible to relate the effect of goals setting with

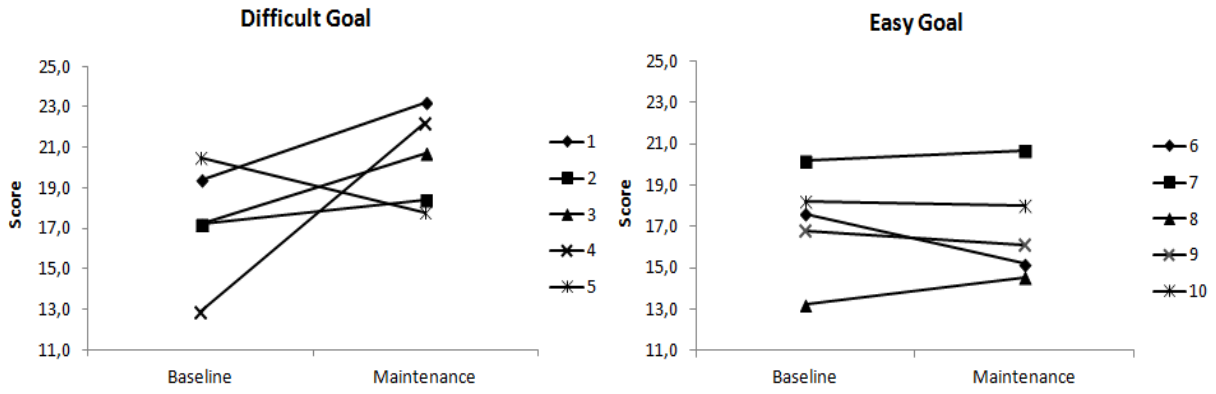


Figure 2. Means score of movement pattern of serve for participants with easy goal and difficult goal

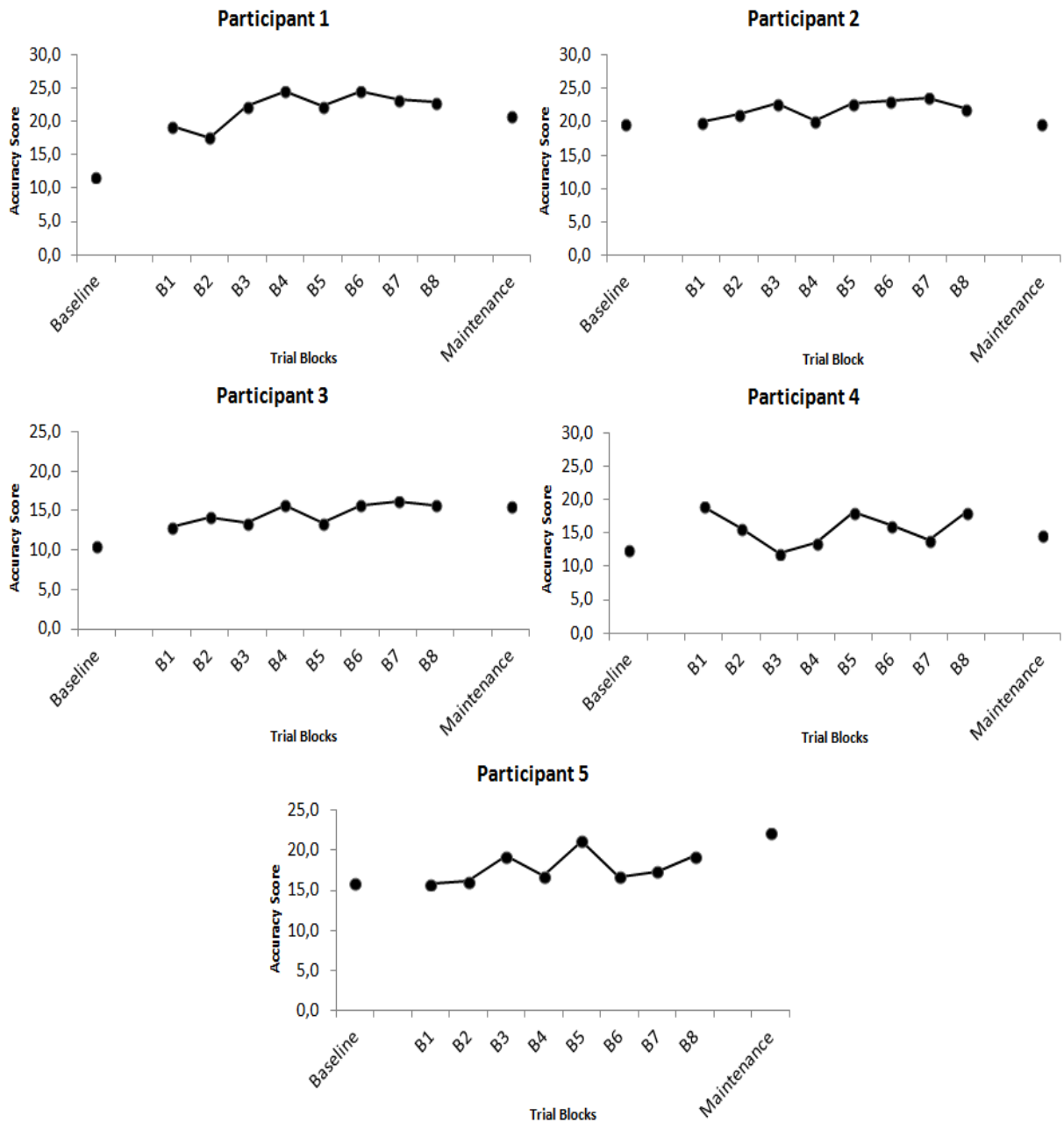


Figure 3. Means of the accuracy scores of serve for participants with difficult goal during pretest, intervention, and retention phases

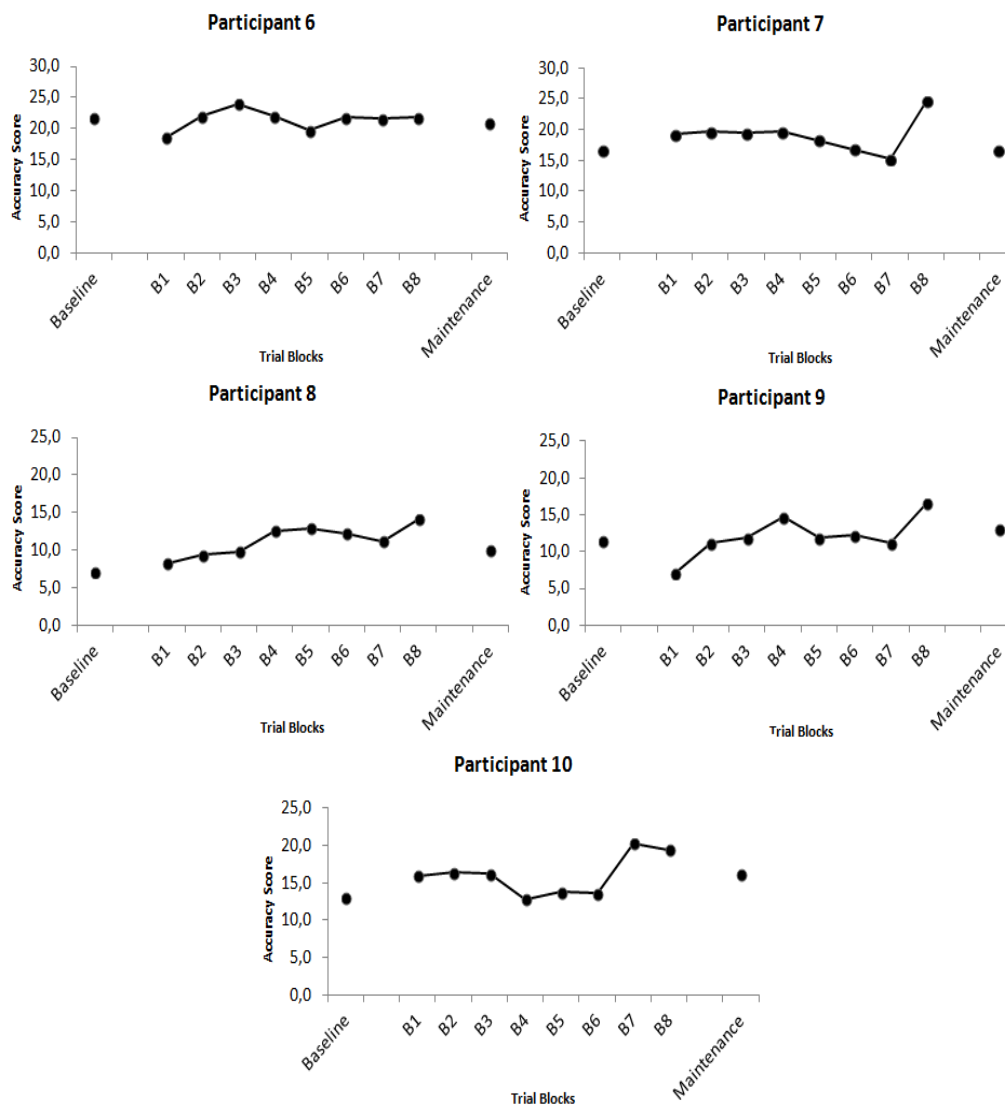


Figure 4. Means of the accuracy scores of serve for participants with easy goal during pretest, intervention, and Retention phases

Participant 4 achieved a change of 72.1% in the movement pattern behavior, increasing from 12.9 in the pretest to 22.2 in the retention. Only the participant 5 demonstrated a decrease in the movement pattern score from 20.5 in the pretest to 17.8 points in the retention (i.e., a 13.2% decrease). Participants with easy goal in the intervention showed the movement pattern behavior more stable. Participant 6 demonstrated the change main with a decrease from 17.6 in the pretest to 15.2 after the intervention (i.e., a 13.6% decrease). Participants 7, 9, and 10 demonstrated stable behavior from pretest to retention no substantial changes (2.5%, -4.2% and -1.1%, respectively). Finally, participant 8 obtained increase from 13.2 in the pretest to 14.5 in the retention (i.e., a 9.8% increase). Figure 3 show the results of the accuracy score of serve for the participants with difficult goal setting. There was improvement of performance in 4 of the 5 participants. Participant 1 demonstrated the higher increase from a pretest mean score of 11.7 to a mean score of 20.8 after the intervention (i.e., a 77.8% increase). Participant 2 showed behavior stable in performance of accuracy with means of 19.7 in both pretest and retention. Participant 3 demonstrated increase from 10.4 to 15.5 (i.e., a 48.7% increase) in the mean scores. Participant 4 increased from 12.5 to 14.8 in the retention (i.e., 18.1% increase). Participant 5 enhanced his performance from a pretest mean score of 15.9 to 22.1 after the intervention (i.e., 39.5% increase).

During the intervention, only the participant 3 no achieved the goal settled in any of trial blocks. Figure 4 show the results of the accuracy score of serve for the participants with easy goal setting. Participants 6 and 7 showed stable behavior on accuracy score with mean of 21.9 in the pretest and 21.1 in the retention for the participant 1 and 16.7 in both pretest and retention for participant 2. Participant 8 demonstrated the higher increase from 7.1 to 10 (i.e., a 40.8% increase) in the retention. Participant 9 increased the pretest mean score from 11.5 to 13.2 after the intervention (i.e., 14.8% increase). Finally, the participant 10 enhanced his performance from 13.1 to 16.1 after the intervention (i.e., 23.2% increase). During the intervention, only the participant 9 no achieved the goal settled in any of practice sessions. In comparison with the participants in that were settled difficult goal, the participants with easy goal showed percentage smaller of change.

DISCUSSION

In this study was used an intervention for investigating the effect of difficulty goal in the learning of volleyball serve. Although the goals established is linked to accuracy to target, was hypothesized that the behaviors of both accuracy score and movement pattern would present change after the intervention due the relations between product and process measure movement (Mally *et al.*, 2011; Robertson & Konczak,

2001). Regarding the goal difficulty, it was hypothesized that the difficult goal would provide greater commitment of participants and consequently higher learning of the volleyball serve after intervention. Thereby, learning was assessed by means of changes in the performance of the accuracy to target and movement pattern of volleyball serve.

Results demonstrated higher effectiveness of difficult goal for improves accuracy to target as well as in the movement pattern in comparison with easy goal. Although the participant 2 had showed a stable behavior in the accuracy score, the percentage changes were superior in Retention for participants with difficult goal in most cases. The current results support the predictions of Locke and Latham (Locke & Latham, 1985) and replicate the previous studies about difficulty of goal that used endurance tasks (Bar-Eli *et al.*, 1997; Tenenbaum *et al.*, 1991) in opposite to some studies that investigated the effect of goal difficulty in sports skills learning (Lane & Streeter, 2003; Mooney & Mutrie, 2000; Weinberg *et al.*, 1991). Our study goes beyond because also assesses the movement pattern of the skill, it that can explain the lack of differences in the previous studies that used sport skills. Further, the individual analyzes allow to evaluate of more clear manner the relationship between movement pattern and accuracy score.

For example, the participant 4 had the lowest movement pattern score in pretest, but analyzing the change after intervention he obtained an improvement of the 72.1% in their performance, while the accuracy performance improved only 18.1%. It occurs because in the learning initial stage is needed to acquire the movement pattern for posteriorly to demonstrate more accuracy and consistent performance (Fitts & Posner, 1967). The results of the participant 8 also support this argument. Although had demonstrated the worse performance in the pretest, her performance showed the higher changes among the participants with easy goal.

On the other hand, the participants 6 and 7 demonstrated movement pattern score higher, but they don't showed change in the accuracy performance. This behavior is explained for two factors. First, they started of a high pretest level that may be harder to improve in comparison with a low pretest (Locke, 1991). This explanation also applies to result of the participant 2 (elevated pretest in the accuracy score) that even with difficult goal demonstrated stable behavior. Second, perhaps easy goals are not able of provide sufficient motivation for individuals with high competence in compare with difficult goals. This occurs because individuals with high self-efficacy are unlikely to choose or commit to easy goals (Latham & Locke, 2007). Therefore, it is need that the goals are challenging to motivate individuals with these characteristics.

In summary, current findings indicate the higher effectiveness of difficult goal in the learning of sport skill. Further, it is needed to consider the movement pattern to investigate the effect of goals setting in the learning of sport skills, even when the goal is established regarding the environment demand. It is suggested that future research investigate aspects that influence the self-efficacy of the participants as the perceived competence, since we considered that the competence in skill can be important for higher effectiveness of the difficult goal.

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