Effects of Attention Focus Guidelines on Acquisition, Retention and Transmitting Steps of Movement form of Soccer Chip Shot in Beginner Children

Mehdi Khalil Arjmandi1*, Hossein Samadi2, Mohammad Jalilvand3

1Department of Physical Education, Firoozkooh Branch, Islamic Azad University, Tehran, Iran
2Department of Physical Education, Taft Branch, Islamic Azad University, Taft, Iran
3Department of Physical Education, Kermanshah Branch, Islamic Azad University, Kermanshah, Iran

*Corresponding Author Email: jalilvand.mohammad@yahoo.com

Abstract

Attention always has been an interesting subject for psychologists and researchers of motor behavior, given the other hand; it is an essential prerequisite for successful implementation of the exercise. But the effectiveness of focus types (external and internal) in the different individuals is still questionable especially in movement form and quality. The aim of this study compared the effects of guidelines focus on the acquisition, retention and transfer soccer chip shot (quality and form of movement) in children as beginner. Materials and methods: In this semi-empirical study of school children (9-11 years), District 15 of Tehran 45 students were selected as sample. Condition for inclusion was that persons did not know the task (the chip football) and their right foot is dominant foot. Samples randomly were divided into three groups of 15 persons (internal, guidelines, external guidelines and control groups). Participants with non-dominant foot (left foot) from a distance of 2.50 meters to hit the ball (soccer chip shot) so that the ball passes over the obstacle 40 cm and to hit 180 cm diameter circular target. The subjects then participated in the pretest, exercised Chip shot for 3 days. During a practice, internal focus groups were offered the description about their body coordination and external focus groups was to provide clarifications about the impact of their performance on environment. The subjects participated in retention and transfer two days after the last day of training. Two qualified soccer coaches observed the quality of participants’ chip shots through recorded videos. Finally movement form and shots quality was assessed at different stages. The ANOVA tests with repeated measures in the acquisition stage and one-way ANOVA test was used for the retention and transfer stages. All analysis was done by SPSS 16 software in significant level of α ≤ 0.05. Results: Results showed significant differences (p ≤ 0.05) between mean in the group stages (acquisition, retention and transfer). So that the internal instruction group obtained the highest mean scores while external instruction and control group in step acquisition, retention and transfer. According to the results that can be said provide instructions related to internal focus to novice children will lead to better performance on the acquisition, retention and transfer stages.

Keywords: The outer, Inner focus, Chip shot, Children beginners.

Introduction

Attention has been an interesting issue between psychologists and motor–behavior researchers. The attention is a part of information gathering process. These data are called behavioral data when they refer to specific patterns of behavior. The researchers have considered different aspects in process of effective variables on learning motor skills, which we can point practice organization, the kind of learner’s feedback, person’s attention focus and model offering (Uehara, 2006). Giving some guidelines to those who tend to learn or while it, is an important factor which has been discussed in this paper. Researchers have seen that weak group work of practitioners is due to the lack of sufficient concentration and attention. For many years, trainers and researchers have found that people’s attention focus has increasing effects on motor behavioral performances. In other words practice accuracy and its quality depends on the level of doer’s concentration. This finding correlates with some new researches (Horn, 2005). To have a more successful performance, attention is an essential prerequisite. Focus on inner attention implies the usage level of your own information, but focus on external attention is on the effects of that move in environment, such as shooting to goal in archery.
field of attention focus, the theory of the lack of automated skills express that external attention for Experience people may be more useful in comparison with novice people because their automated level is different. This means that as the skill level increases, the need to focus on the process (that is involved in the execution of skill) is decreased step by step. Because parts and components of that skill is stored in long-term memory when the skilled person focuses on these components again (which are executed by the automated high level) an analysis occurs at the control system that resulted to loss of function (Schmidt and Lee., 1999).

Besides, in motor tasks, wulf, shea and park (2001), wulf and McConnel (2002), wulf (2007), researches results are lead to constrained-action hypothesis. This hypothesis raise that the efficiency of external attention is due to conscious interference in the control process and inadvertent disorder in the coordination of fairly automated process which they control the movement. Interesting exceptions have been reported in connection with this hypothesis, for instance, very skilled golfers with outer attention and novice golfers with inner attention had better function (Wulf, 2007). Uehara (2008) examined the effects of the attention focus guidelines on learning the football chip shot in the novice people. Twelve adult participants rehearsed chip shot with their non-best foot from over the obstacle towards the circular target. One group were received internal instructions and another external instruction. Results indicated that the two group’s participants improved their performance and were able to recall skill after two days. Also there were no significant differences between groups from the view point of measuring the performance result (accuracy and consistency) and qualitative analysis of their movement (the point of movement form by two trainers) Emanuel and colleagues (2008) in a research entitled “the effects of attention focus and age on the acquisition, retention and transfer” checked the effects of attention focus on adults and children. 34 children and 32 adults were randomly assigned into two groups of focus inner attention and focus outer attention. Task involved throwing darts towards a fixed target that participants attempted 50 acquisition efforts, 20 retention efforts and 20 transfer efforts. Results showed that attention focus in children and adults was significant in accuracy and variability at the acquisition stage which means adults function that trained at the outer attention focus group became more equal and more accurate with the development of training exercises. There was significant difference between children and adults at the transfer stage, so that children in the inner focus group were more accurate in throwing darts. No significant differences were found between groups in the retention stage.

Wulf (2009) conducted a study entitled external focus instructions reduce postural instability in individuals with Parkinson disease to investigate the effects of instructions about focus of attention on Parkinson patients. They aimed to examine the generalizability of the attention focus effect on balance performance in Parkinson patients. A number of 40 subjects participated in the study and were asked to balance on an unstable surface. They were instructed to either focus on reduced movement of their feet (internal focus) or reduced disk movement (external focus) or they received no attention focus instruction at all (control). The results showed that external focus resulted in less postural sway comparing with internal focus and control conditions. Also, the results showed no significant difference between internal focus and control conditions.

Despite recent evidence generalizing the outer focus benefits were questioned during acquiring the motor skills. Undoubtedly one of the most important factors in the learning process is using the attention guidelines and because the most of the previous researches have focused on adults and young people-but the skills training is regarded more in childhood and adolescence so the present research is focused on children (Schmidt, 1999). The most researches that have introduced outer attention better, with using laboratory exercises have used adults as subject that have more move experience towards children (Uehara, 2008). Assignments such as duty of football chip shot that was field and the children did that, may figure the other results. Since most researches in adults, novices and skilled have shown the superiority of outer instructions in comparison with inner instructions, more researches are needed to determine whether the subjects ages effects on the benefits of attention focus. This research explores the question of what kind of guidelines that focuses on learning and transfer of the chip shot is more useful in novice children?

Methodology

Present research method is semi-empirical. Statistical population of the present research consisted of all non-athletic boys aged 9-11 (average and standard deviation of 10.39 ± 0.43) from fifteen district in Tehran. The sample were included 45 right–leg students. These people were considered to be novice at the task, randomly selected and participated in the test session. In this research, participants must hit chip shot the stationary ball with their non-dominant (left foot) foot. Chip shot is a technique that is used for passing the ball over the barrier or goalkeeper of the opponent team. This task was selected because individuals with no experience of football skills, are unlikely to execute the basic pattern of football chip skill (Hancock, 1995).execution of this technique lasted for 4 days for each subject. Students were participated individually in this research. Before each experimental session, participants were asked to warm up sufficiently (5min) with jogging and stretching. In the first experimental session, each participant was provided basic information about football chip shot. They were informed that the football chip shot is the technique which is used to loft the ball over an opponent defender or goalkeeper. They also have been notified about the task target that was hitting with their non-dominant foot (left foot) over the barrier (40cm) towards the target area. Then participants made six attempts at familiarity stage with test which, barrier (metal rolling pin) had 3m distances from the target.

It should be noted that this distance varies with the distance of the test (2.5m). Following the current efforts, participants were doing the pre-test which was including six chip shots towards the target center (circle with 180cm radius). After 5 min resting, participants were doing 30 attempts divided into 5 blocks of six, and this exercise was covered in the second and third day. In this stages (including three days of training) before doing each block (5attempts) for participants related to their own group, instructions was played about football chip shot by the audio system. In addition to the control group wasn’t given any instruction about the chip shot. Delayed retention test was 8 attempts which two days after the last day of training is conducted in the presence of classmates.
and instructors. Following the delayed retention test, after 10 minutes, transfer test which consists of 6 attempts was done in the presence of classmates and the instructor.

Inner attention focus group was only receiving the inner guidelines of attention which the sentence of these guidelines were indicating the coordination of their movements. Outer attention focus group was only receiving the outer attention guidelines which were indicating the effect of their movement. In addition verbal signs or metaphors were used for outer attention focus group because, as Wulf (1998) reported in verbal signs may contribute to the execution of the move raised concerns in order to concentrate to control the amount of provided information, for both groups were about equal in terms of volume. The form of movement was also used to qualitatively analyze the subjects’ movements. The quality of participants’ movements was videotaped using a digital camera and evaluated based on the following criteria in every attempt.

1. Do the subjects appropriately position their right foot near the ball?
2. Do they sufficiently accelerate their kicking foot to shoot the ball?
3. Do they sufficiently hold their left heels raise?
4. Do they use the front and lower parts of their feet to kick the ball?
5. Do they kick the ball quickly and accurately without extra movements?
6. Do they stand in an appropriate status?

Two qualified soccer coaches observed the quality of participants’ chip shots through recorded videos. They scored the participants’ shot performance on a 0-15 point scale whereby 15 indicated perfect shot performance and lower scores signified faulty performance (Uehara, 2008). To test the research hypothesis and to analyze data and to assess significant average differences in the retention and transfer stages, variance analysis with repeated measures (ANOVA), and in the retention and transfer stages, one way variance analysis were used. In this research, independent variable (instruction) is included outer attention and attention. This research project examined the acquisition stage of 3 (group) × 3 (repeat) times 2 (instruction) and at the retention and transfer to a 3 (group) times 2 instruction. Gauchely test of sphericity was used for homogeneity, and in groups which test was significant greenhouse-geisser scores was used. In groups which difference was significant to identify couples who have significant difference post hoc tukey test (HSD) was used.

Results

Figure 1 shows scores during three phases. In addition the results (table 1) in analysis of variance with repeated measurement; there were significant differences (p≤0.05) between the averages of group’s scores the retention and transfer stages.

Figure 1. The average of group's scores at different stages.

Pearson correlation formula was used to calculate the correlation between the scores assigned by the two coaches. The correlation coefficient of the scores on the form of movement was calculated between the two coaches for every test. Accordingly, the coefficient of the form of movement was calculated to be 0.72 in the pre-test, 0.82 in the retention test and 0.76 in the transfer test. Cronbach alpha formula was run to examine the internal consistency of the coefficients, which yielded alpha coefficients of 0.78 in the pre-test, 0.80 in the retention test and 0.81 in the transfer test (alpha coefficient greater than 0.70 is considered as excellent). Test of homogeneity of variances was run to assure both the consistency of errors during subjects’ introduction to the test and
ineffectiveness of initial differences on test results. The results of ANOVA showed no significant difference in the mean scores among the groups during subjects’ introduction to the test (P<0.05).

Table 1. Results of analysis of variance with repeated measures to compare the average of group’s performances at different stages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Total squares</th>
<th>Opening degree</th>
<th>Average squares</th>
<th>statistic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed retention</td>
<td>17.2</td>
<td>2</td>
<td>8.60</td>
<td>5.34</td>
<td>0.009</td>
</tr>
<tr>
<td>Transfer</td>
<td>8.40</td>
<td>2</td>
<td>4.20</td>
<td>3.76</td>
<td>0.031</td>
</tr>
</tbody>
</table>

Considering the significant difference in the mean scores among different groups during training sessions, Tukey’s test was run to identify where the groups were significantly different. As shown in Table 2, internal instruction group obtained the highest mean scores while external instruction group received the lowest mean scores. Besides, there is a significant difference in the mean scores between internal instruction group and external instruction and control groups in delayed retention stage. As shown in Table 3, both internal and external instruction groups obtained the same mean scores and fell in the same group. As well, both external instruction and control groups obtained the same mean scores and fell in the same group. However, while internal instruction group has the lowest mean error score, the control group has the largest one. In other words, in the transfer stage, there is only a significant difference in the mean scores between internal instruction and control groups.

Table 2. The result of tukey test during delayed retention.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal focus</td>
<td>15</td>
<td>7.40</td>
<td></td>
</tr>
<tr>
<td>External focus</td>
<td>15</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>1.00</td>
<td>0.903</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. The result of tukey test during transfer

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal focus</td>
<td>15</td>
<td>7.06</td>
<td></td>
</tr>
<tr>
<td>External focus</td>
<td>15</td>
<td>6.13</td>
<td>6.13</td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>P-value</td>
<td>1.00</td>
<td>0.903</td>
<td></td>
</tr>
</tbody>
</table>

Discussion and Conclusion

In short, it seems that attention focus is one of the factors affecting the performance and progress in learning the different motor skills, the findings from this research suggest that educators and teachers for guiding students to focus on resources of inner and outer must consider their overall skill level and age. Although research on the effects of different outer and inner attention focus on performance and learning skills, has shown that outer focus of attention would be more effective, however, other variables affecting performance and learning should not be ignored. So that the effects of guide lines of attention focus mainly do happen at all types of skills and educational environment (Olivier, 2008). These results are parallel with hypothesis of (Beilock, 2004) that arose in. They suggested that attention to execution of well-learned skills is harmful for function. By the time of advancing the learning the need of attention to step by step processes involved skilled function decreases because the components of skill are planned in long-term memory and with attention focused on the planned components- that go on under conscious control decreased levels (automated) the processes of skill are returned to working memory until the skill are broken down into its components. So that decreasing in function is observed when skilled people refocus their attention to certain components of skill (Emanuel, 2008).

But the result of this research is not consistent with wulf limited action hypothesis (2003). Based on this view, attention focus on movement’s effect increases automatic control method. But as newell (1985) stated novices at the coordination stage, are learners that still collect motor basic pattern for getting the task target and because generally getting a automated process is gradual and not seem that novice children have reached to a stage of learning the individuals attention to organs and body movements, can interfere with the automated process (Wulf, 2007). The results of this research, consistent with Oliver and colleagues (2008) show that selective attention process improve with age, for instance children use different strategy than adults. In addition, kinematic system matures at around age 11, and because the guidelines of the inner attention focus emphasize on the kinematic system (Emanuel, 2008). So children at the beginning of the learning according to less motor experience than adults likely more benefit from inner attention for learning.

Wulf research in 2009 showed that there are limitations in increasing the effects of execution for outer guidelines. He suggested for novices that haven’t developed the motor program may not be reasonable to focus on the effects of high levels. In
return for novice strikers focus on the effects of low levels (like the movement of striker's foot) is more effective than focus on the effects of high levels (like the path of the ball).

However, automatic motor control of a process is hidden (invisible). In which the movements are executed more efficient and more accurate. The conscious control of body movements in adults (according to inner guidelines) may stop the process of motor control that automatically regulates the movements, especially for those who, their hidden learning is not proud. Automatic motor control that is relevant to the motor experience may be more effective in adults than children (Perkins, 2003). This discovery is along with the findings of Perkins (2003), Beilock (2004), Wulf (2007) and Emanuel (2008). They concluded in their research protocols that in the acquisition stage the different guidelines of attention focus cause different function in different people, so that inner guideline group cause better function in novice individuals than the other groups. The present findings do not correspond to the findings of Zentgraf (2009). A possible reason can be the differences in the tasks. Zentgraf (2009) used juggling tasks in their study, which is object-oriented, namely, the subjects should focus on the object (ball) to perform the task. Therefore, internal instructions may require the novice to do extra information processing to do this type of tasks. Furthermore, internal focus instructions generally refer to the coordination of movement in the performer (Wulf, 2007) so that they may help improve the form of movement in the subjects. In addition, using kinematic system as a source of feedback may improve both motor behavior and motor awareness. In instructions of internal focus of attention, the emphasis is placed on the kinematic system. As the kinematic system tends to mature around the age of 11 (though our subjects were younger), the present study showed that, consistent with the findings of Emmanuel (2008), both kinematic feedback (perceived movement) and motor performance improved in children when they were trained to focus on their body movements.

As shown in Figure 1, control subjects even obtained higher scores for the form of movement comparing with external instruction subjects (though the difference was not statistically significant). A possible explanation can be that people do not utilize their optimal focus of attention automatically (unpremeditated). Several studies (Wulf, 1998, Wulf, 2003, Wulf, 2009) have showed this process. The reason may be that the content of instructions the individual follows are supplied by others. In training environments that entail learning and retraining motor skills such as music and physiotherapy, there are ordinary instructions that address body movements in the performer. Thus, it is no surprise that these people focus on their body movements automatically or spontaneously. Besides, these people may tend to be cautious with complex or new motor skills, particularly with skills that require balance (Wulf, 2009).

The results of the research can be collinear with the finding of Uehara and colleagues (2008). They haven’t found significant different between training groups in execution. But as they pointed out, although was not statistically significant, inner focus group had fewer errors in execution. They expressed that a mixture of novice people in the coordination stage of new well model and advanced novices in the control stage of new well model may had caused no difference between groups. It is used in the research of children who have fewer motor experience than adults (totally novice), thus, even assuming that they have no experience in football chip shot task, the tasks are performed with less automated. As expected inner guiding group has had better function than outer group. In addition, research findings are inconsistent with the results of researches of wulf (2001), wulf (2002), wulf (2009) possible reasons of failure to comply with the above results can see differences between tasks and the nature of laboratory tasks and field. Herbert and salmon (1996) claim that athletic skills are generally more complex than laboratory tasks, because they are involve a higher degree of freedom and mental. On the other hand, the effects of attention focus are stronger in complex tasks. Also this difference between the results of field researches and laboratory can be interpreted based on the difficulty of the task (Brady., 1998).

In addition in this research were used children as participant, whereas, in most previous researches had been used adults. Also children like the novice players are limit in lack of experience, unfamiliar with tasks and motor storage; in contrast, most adults have been exposed to a variety of motor tasks (Olivier, 2008), so that they can be considered as advanced novices. Overall, our results are collinear with the hypothesis that conscious control of movements, especially at the beginning of the learning process, is effective for learning. This research suggests that trainers for learning more in children, in teaching the skills that are in terms of the complexity of the football chip task, the use of inner guidelines are priority.

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References


