
External Focus of Attention Enhances Children's Learning of a Classical Ballet Pirouette

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Abstract

The purpose of the present study was to investigate the influence of instructions promoting an external versus internal focus of attention on the learning of a specific balance task, the pirouette en dehors (from fourth position), in 10-year-old novice ballet students. In addition, we sought to gain insight into learners' motivation and subjective learning experience as a function of different focus conditions. Thirty-eight children were randomly assigned to one of two groups. In the external focus (EF) group, participants were asked to focus on a spotting point on the wall in front of them for as long as possible. In the internal focus (IF) group, participants were asked to focus on the initial position of their head relative to the wall in front of them and on keeping it in that position for as long as possible. The task goal was to rotate as far as possible, and the dependent variable was the number of degrees rotated. All participants performed 15 practice trials of a (right) pirouette. Two days later, participants completed retention and transfer (left pirouette) tests without attentional focus reminders. After the practice phase, participants were asked what they thought about while practicing the pirouette and completed self-rating scales related to their perceived competence, effort, and sense of the importance of doing well. The EF group demonstrated superior per-

formance relative to the IF group during practice, retention, and transfer phases. In addition, EF participants' responses indicated higher perceived competence and greater satisfaction with their performance, as well as greater importance of performing well. In contrast, IF participants reported more nervousness and fear of losing balance and not doing well. Overall, the findings demonstrate that external relative to internal focus instructions enhanced the students' learning of the pirouette en dehors and had positive motivational consequences.

Knowledge of how motor performance can be optimized in order to facilitate motor skill learning is a common interest of movement researchers and professionals. The direction in which instructions are focused is considered to impact directly the performance and learning of motor skills.¹ A significant amount of research in the past 20 years has observed that instructions promoting an external focus of attention, in which the attention is focused on the trajectory of an object or a specific target in the environment, can benefit learning more than instructions that induce an internal focus of attention, where the learner focuses on his or

her body movements. This difference has been observed in different skills, populations, and levels of expertise, through a variety of measures reflecting higher movement effectiveness (e.g., balance, accuracy) and efficiency (e.g., force production and energy expenditure).²

Despite the extensive number of studies on the subject, those that have investigated the effects of external focus of attention on children are minimal. It is well known, however, that children differ from adults in the ability to control their focus of attention,³ thus presenting a challenge to the generalization of research results from adult to child populations. Studies have observed that children exhibit a lower capacity for "top-down" control of attention than adults, allocating their attention less efficiently in accord with task demands and using less sophisticated strategies in dual tasks involving complex activities.^{3,4} Less efficiency and flexibility in strategies of visual selectivity in order to adjust behavior to task demands and greater vulnerability to interference from distracters relative to adults have also been observed.^{5,6} Nevertheless, superior learning effects of external focus relative to internal focus were observed in children performing tasks that included throwing soccer balls,⁷ throwing beanbags to a target,⁸ the tennis forehand stroke,⁹ riding a Pedalo® (a dynamic balance task involving alternately pushing two

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platforms forward and downward, similar to the pedals of a bicycle),¹⁰ and a golf putting task.¹¹

Studies of the attentional focus effects on performance of form-based skills that do not involve any kind of implement, as for example in most dance or gymnastic skills, remain particularly lacking. To date, only one study¹² has observed the effects of instructions inducing different attentional foci on children's performance in this type of task. In this within-participant design study, 12-year-old children performed better at a specific gymnastic skill consisting of a maximum vertical jump with a 180° turn while airborne, under an external focus relative to an internal focus of attention. The children utilizing an external focus also outperformed a control group to which no focus instructions were given.

The more permanent effects (motor learning) of external focus of attention on form-based complex skills in children also remain to be explored. Thus, there is clearly a need to evaluate to what extent instructions inducing an external focus of attention would enhance this type of learning. Considering that many coaches provide instructions to induce an internal focus of attention, and that not only learners but also professional ballet dancers usually tend to focus more on body movements,^{13,14} we deemed it important to conduct such research. The objective of the present study was, therefore, to determine the effects of instructions promoting external versus internal focus of attention on the learning of a pirouette en dehors (from fourth position) among 10-year old ballet students. The pirouette is an important dance component that integrates ballet movements that are difficult to learn and require considerable skill in control of the body.¹⁵ Participants were dance beginners and practiced the task under an external or an internal focus condition. In addition to assessing the immediate effects on performance,¹³ we were especially interested in verifying whether our attentional focus manipulations

would have long-term effects on pirouette learning, which is typically measured by delayed retention and transfer tests.^{16,17} We also sought to gain insight into learners' motivation and subjective learning experiences as a function of the different focus conditions.

The induction of an external focus of attention is considered to facilitate automaticity, as illustrated by greater movement fluidity,¹⁸ increased functional variability,¹⁹ high-frequency movement corrections reflecting greater involvement of reflexes,²⁰ and reduced attentional demands.^{18,21} As such, external focus of attention has the potential to accelerate the learning process compared with an internal focus, which tends to interfere with automatic processes.²¹ Hence, we hypothesized that the young students receiving external focus of attention instruction would demonstrate higher level motor learning and a more positive attitude than those receiving internal focus of attention instruction.

Method

Participants

Thirty-eight female students with a mean age of 9.5 years (SD = 0.8) were recruited from two dance schools. The participants had some experience with classical ballet (mean = 1.9 years, SD = 0.79) but no previous instruction in the pirouette. They were unaware of the purpose of the study.

The research was approved by the investigators' university ethics committee. Oral assent was obtained from all participants and informed consent was granted by their parents or guardians and the two schools.

Task

The task involved learning a classical ballet movement, the pirouette en dehors (from fourth position). This movement consists of a complete rotation of the body around the longitudinal axis on one foot. Participants began the execution of the pirouette with the feet positioned in the middle of a circle. The circle was divided into eight equal sections; each section represented one point, and scores were awarded based on the extent of the rotation to the right or left (Fig. 1). The goal of the task was to rotate as far as possible, and the dependent variable was the number of degrees rotated. The study was conducted in a room with a wooden floor, and the participants wore ballet shoes.

Procedure

The participants were randomly assigned to one of two groups prior to the practice phase. They were informed that the task goal was to rotate as far as possible, and they received general instructions about the task. Next, all participants performed two pretest trials. After the pretest, the students received specific attentional

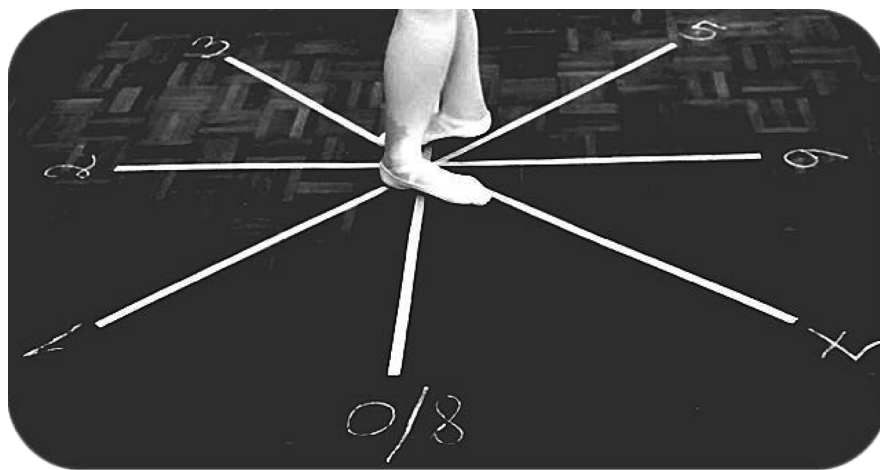


Figure 1 The circle divided into the eight sections used for the punctuation scores and the participants' starting position.

focus instructions according to their assigned group. In the external focus (EF) group, participants were asked to focus on a spotting point on the wall in front of them and fix their gaze on it for as long as possible. In the internal focus (IF) group, participants were asked to focus on the initial position of their head relative to the wall in front of them and keep it in that position for as long as possible. All participants then performed 15 practice trials of a (right) pirouette. Two days later, they completed retention and transfer (left pirouette) tests for five trials without attentional focus reminders.

After the practice phase, the participants were asked to answer an open-ended question: “What were you thinking about while practicing the pirouette?” They also graded themselves on three scales related to their perceived competence, effort, and sense of the importance of doing well: “I think I did well at the pirouette”; “I put a lot of effort into doing the pirouette”; and “It was important to me to do the pirouette well.” There were four possible responses to each of the three statements, ranging from “not competent/not important” to “very competent/very important,” and appropriate “smiley” or “frowny” faces accompanied each response. The responses to each statement were given 1, 2, 3, or 4 points for analysis purposes.

Data Analysis

The pirouette punctuation scores were analyzed in 2 (group: external vs. internal focus) \times 5 (blocks of three trials) analysis of variance (ANOVA), with repeated measures on the last factor for the practice phase, and in separated one-way ANOVAs for the pretest, retention, and transfer tests. The motivational scores were analyzed using separate one-way ANOVAs. The alpha level for significance was set at 0.05 for all analyses.

Results

Pirouette Scores

On the pretest, there were no significant differences between groups (Fig.

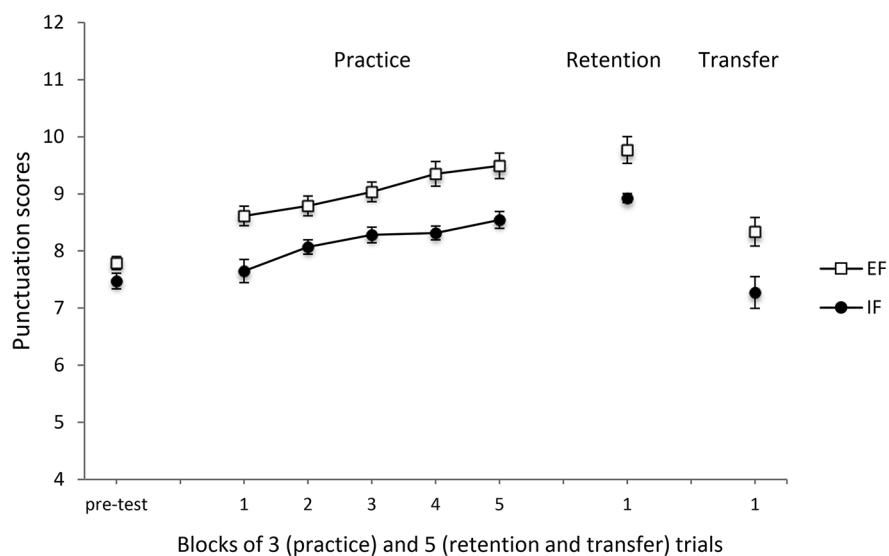


Figure 2 Punctuation scores of the external and internal focus groups during pretest, practice, retention, and transfer. Error bars indicate standard errors.

2), [F(1,36) = 2.99, $p > 0.05$, $\eta_p^2 = 0.07$].

During practice, although both groups increased their pirouette punctuation scores (Fig. 2), the scores were higher when participants adopted an external focus compared with an internal focus. The main effect of group [F(1,36) = 18.03, $p < 0.01$, $\eta_p^2 = 0.33$] and block [F(4,144) = 20.12, $p < 0.01$, $\eta_p^2 = 0.35$] was significant. No interactions were observed between blocks and groups [F(4,144) < 1].

Analysis of the retention test revealed significant differences between groups [F(1,36) = 11.04, $p < 0.01$, $\eta_p^2 = 0.23$], (Fig. 2), with participants of the external focus group presenting higher scores than the internal focus group.

Significant differences were also found between the groups in the transfer test, with the external focus group again demonstrating higher scores [F(1,36) = 7.69, $p < 0.01$, $\eta_p^2 = 0.17$], (Fig. 2).

Questionnaire

Relative to the internal focus group, external focus group participants rated the importance of performing well higher after practice [F(1,36) = 6.42,

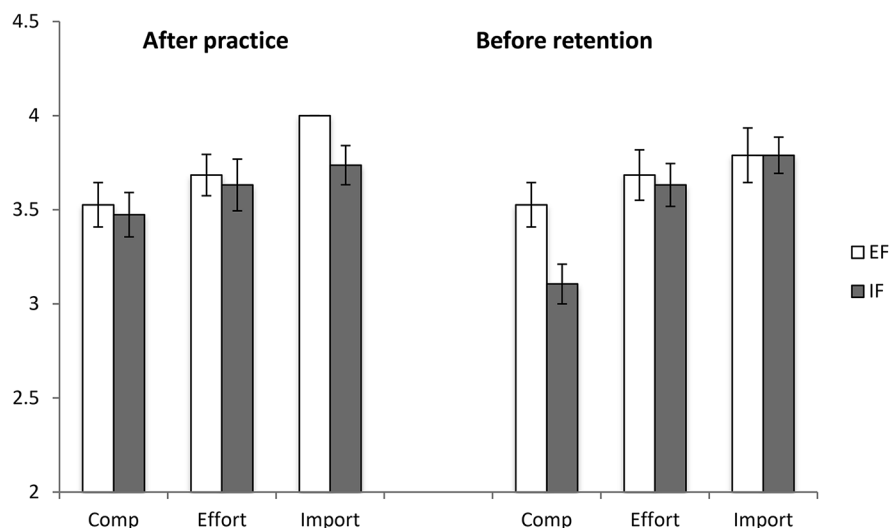


Figure 3 Motivational ratings of the external and internal focus groups after practice and before retention. Error bars indicate standard errors.

Table 1 Responses to the Question “What were you thinking about today while practicing the pirouette?” that was Posed at the End of Practice (Translated from Portuguese)

External Focus Responses	Internal Focus Responses
1. That my mother was about to arrive	1. I was afraid of doing it wrong
2. About what I should do	2. That I could get a bit dizzy
3. I was trying to improve	3. I was thinking about the teacher's instructions
4. Only in the pirouette	4. In learning the pirouette
5. I did not think of almost nothing, just thought I was going to get it	5. I was afraid of falling
6. In what the teacher told me to do	6. That I was doing it well
7. I was thinking about improving	7. Wondering if I would be able to do it well
8. In doing it well	8. I was worried because I lost my balance sometimes
9. In doing a better and better trial	9. I was trying to do it better
10. In looking at the wall	10. That I was doing it okay
11. That I was feeling pretty cool in this game	11. I thought I would not be able to do it
12. I was wondering if I was going to win or lose	12. That I was doing it well
13. That I was feeling well	13. That I would not be able to do it well
14. I was thinking that I was doing well	14. I was feeling a little bit well
15. I was thinking only about the pirouette	15. That I was doing it well
16. That I wasn't doing it well	16. I was trying to do it well
17. In looking at the wall point	17. In concentrating on the pirouette
18. I wanted to do the pirouette well	18. I was thinking of the movements of my head
19. I just thought I would be able to learn	19. That it was difficult to control the head movements

$p < 0.05$, $\eta_p^2 = 0.15$] and perceived competence as higher before retention [$F(1,36) = 7.11$, $p < 0.05$, $\eta_p^2 = 0.16$]. No other differences were observed (Fig. 3).

Thoughts During Practice

At the end of the practice phase, participants of both groups were asked, “What were you thinking about while practicing the pirouette?” Their responses are listed in Table 1. It was observed that most of the participants in both groups reported positive answers related to their general feelings and perceptions of competence while performing the task. However, while participants of the external focus group reported mainly positive answers (e.g., “I was thinking about trying to do it better”; “I was trying to improve”; “I was enjoying it”; “I was thinking that I was doing well”; and “I just thought I would be able to learn”), some participants in the internal focus group reported negative feelings about their practice (e.g., “I

was afraid of doing it wrong”; “I was thinking about the teacher's instructions”; “I was afraid of falling”; “I was worried because I lost my balance sometimes”; and “I was trying to do it better”), suggesting greater nervousness and a fear of losing balance and not doing well.

Discussion

The present study was designed to investigate the effects of instructions promoting external versus internal focus of attention on the learning of a form-based skill, the pirouette en dehors (from fourth position) in 10-year old dance students. Our results show that participants practicing the pirouette with instructions inducing an external focus of attention outperformed participants receiving internal focus instructions. These findings are in accordance with previous results in adults,² where the benefits of an external focus have been found regarding movement effectiveness in tasks involving accuracy, such as

throwing at a target²²⁻²⁴ or balancing.^{20,25-27} External focus of attention was also observed to enhance adults' movement efficiency with results showing low muscular activity²⁸ and maximum force production²⁸⁻³⁰ in different tasks. Focusing on the intended goal or effect of the movements has also been shown to produce more efficient recruitment of motor units,³¹ a “freeing” of the body's degrees of freedom,³² and increased functional variability.¹⁹

The results are also in accordance with previous findings in children learning tasks involving implements, such as golf clubs,¹¹ racquets,⁹ balls to be thrown,⁷ or the Pedalo,¹⁰ as well as in children performing a gymnastic skill.¹² Thus, instructions inducing an external focus of attention enhance the learning of form-based skills, such as the classical ballet pirouette en dehors.

The induction of an external focus of attention may not only facilitate learning by simply directing learn-

ers' attention to the task goal, but also by reducing focus on the self, compared with instructions inducing an internal focus.¹ In fact, an internal focus of attention may act as a "self-invoking trigger," where references to body parts or movements can result in increased access to the neural representation of the self, bringing about self-evaluative regulatory processes that influence thoughts and behaviors with the potential to degrade performance and learning.³³ Our questionnaire results appear to concur with this suggestion. When asked what they thought about while practicing the pirouette, internal focus participants reported greater nervousness and fear of losing balance and not doing well than external focus participants. Participants practicing with an external focus, on the other hand, reported a greater sense of the importance of performing well after practice and increased feelings of perceived competence. Thus, different motivational consequences can also result from an external relative to internal focus of attention.

The present findings contribute new information on the influences of external and internal foci of attention in children and have theoretical and practical implications. Theoretically, we have demonstrated that form-based skills, such as the pirouette en dehors, could be improved in children instructed to focus externally instead of internally, that is, on their body movements. Positive motivational consequences can also be expected in children following external focus instructions. Our results are in agreement with evidence from the extensive research literature on attentional focus and motor learning.² In practical terms, teachers can expect an increase in children's level of performance and learning of form-based skills (such as the ballet pirouette) as well as in motivation, simply by directing their students to an external, preferentially a distant,¹⁰ focus of attention. Future experiments could examine the effects of instruction inducing external focus of

attention on children's performance and learning of other dance skills, as well as observe in general the effects of different foci of attention on children's movement efficiency.

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