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Research Paper

The Effect of Instructional and Motivational Self-Talk on Learning a Basketball Shot in Adolescents with Autism

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Abstract

The purpose of this study was to examine the effects of instructional and motivational self-talk on learning a basketball shooting skill in adolescents with autism**.** The present study applied a causal-comparative approach. The participants were 48 adolescents with autism in the age range of 16 to 19 years who were randomly and equally divided into three groups: instructional self-talk, motivational self-talk, and control. The motor task was a Basketball shooting, where the throws were assessed between 0 to 2. Subjects performed pre-test (including three trials), acquisition phase (including five 10-trials blocks), and retention-test (including three trials). Perceived ability was also measured. During practice phase, the subjects in the instructional group were instructed to repeat the phrase "loop-goal" before each throw, while those in motivational group were instructed to repeat the phrase "I can" before each throw. The subjects in the control group performed the same protocol but without any instruction. The findings showed that participants in instructional and motivational self-talk performed significantly better on Basketball throw scores on the retention test than control group. Also, both instructional and motivational self-talk groups reported higher perceived ability than control group. These findings indicate that people with autism benefit from self-talk to learn a new motor skill, which subsequently indicate that these individuals have the mechanisms needed to learn new skills through self-talk.

Keywords: Self-talk, autism, motor learning, perceived ability.

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1. Introduction

In recent decades, researchers have examined the impact of different training methods and variables on the performance and learning of new motor skills. Some of these methods include pattern display (Mokhtari, Shojaei, Dana, 2007; Rafiei and Dana, 2019; Farsi et al., 2016; Ghorbani and Bund, 2014, 2016), focusing attention (Ghorbani, Dana, and Fallah, 2019; Ghorbani, Dana, and Christodolides, 2019, 2020), and mental imagery (Dana and Gouzelzadeh, 2017). However, in recent years, motor learning researchers have explored the impact of a new method in teaching motor skills

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known as self-talk. A review of previous research on self-talk shows that in professional sports, professional athletes make extensive use of self-talk at various times during competition or training to improve their level of performance. Also, some studies have examined the effect of self-talk on learning new motor skills and have shown that sports educators make extensive use of self-talk to teach new motor and sports skills to beginners (Hatzigeorgiadis et al., 2008, 2009, 2011; Dana et al., 2011).

In the literature, self-talk is divided into different types. However, the two types of self-talk that are most commonly used in research include motivational and instructional self-talk. Motivational self-talk improves performance and learning by increasing self-confidence and motivation, reducing anxiety, putting in more effort with less energy, and creating positive moods. On the other hand, instructional self-talk improves the focus of attention and technical information and appropriate executive strategies, and thus improves performance and learning. Numerous studies have examined the effect of instructional and motivational self-talk on the performance and learning of new motor skills in new students and using different motor tasks. These studies have shown that the use of instructional and motivational self-talk during practice improves the performance and learning of new motor skills in the novices (Hatzigeorgiadis et al., 2008, 2009, 2011; Dana et al., 2011). For example, Dana, Vaez Mousavi and Mokhtari (2012a) showed that both instructional and motivational self-talk improved the performance of adolescent learners in performing a basketball skill. However, motivational self-talk led to better performance than instructional self-talk. In another study, Dana, Vaez Mousavi, and Mokhtari (2012b) showed that the effectiveness of educational and motivational self-talk depends on the type of motor task.

Bandura (1997) proposed the theory of self-efficacy, which is one of the most important theories in psychology. Motor learning scientists have cited many reasons to justify the effect of self-talk on performance and learning new motor skills. However, one of the theories that has attracted the most attention is Bandura's theory of self-efficacy (Bandura, 1997). According to this theory, the reason for the effect of self-talk on athletes' performance is to increase their self-efficacy. Bandura considers self-efficacy as a sense of competence and adequacy and ability to cope with various issues. He believes that people with strong self-efficacy are more diligent in executing tasks than people with weak beliefs, and naturally perform better at tasks.

Previous research on the effect of self-talk on performance and learning new motor skills has been done mainly on healthy people. Although these studies has enhanced our knowledge about the effect of self-talk on exercise and motor learning, the effect of self-talk on improving performance and motor learning in specific groups is unclear, and few studies have examined the effect of self-talk on people with ADHD, autism, mental disorders and ... have dealt. For example, Bakhtiari, Hashemi, and Nasiri (2016) showed that instructional self-talk leads to improved motor performance in children with ADHD. However, the effect of self-talk on people with autism has not been studied. Autism Spectrum Disorder is a broad term used to describe a group of neurodevelopmental disorders. This disorder is characterized by communication and social interaction problems. People with autism often show limited, repetitive, and stereotypical signs or patterns of behavior. Autism is the third most common cause of developmental defect in children after mental retardation and cerebral palsy. It has been shown that people with autism often also have mobility disabilities. Therefore, it can be expected that the performance and learning of motor skills in people with autism will be associated with challenges. Therefore, due to the lack of research data on the use of self-talk in improving the performance and motor learning of people with autism, the aim of this study was to investigate the effect of instructional and motivational self-talk on learning a basketball shooting skill in adolescents with autism.

2. Method

The present study applied a causal-comparative approach. The participants were 48 adolescents with autism in the age range of 16 to 19 years who were randomly and equally divided into three groups: instructional self-talk, motivational self-talk, and control.

2.1. Motor task: A Basketball throwing skill was used as motor task in this study. Participants performed this skill with standard tools including a standard ball and board. To do that, the participant was required to stay behind the line and throw the ball towards the hoop. The participant got 2 if the ball landed inside the ring, 1 if the ball hit the ring or the square part of the board, and 0 if no one has occurred.

2.2. Procedure: First, by referring to the individual file in the school, a demographic information sheet was completed for each child. Subjects were tested separately in the gym. Upon entering the room, the subject received the initial explanations of the present study. Then, the subjects received two familiarization trials, where they were asked to practice Basketball throwing skills twice. Then, they performed the pre-test, where they performed Basketball throwing skills

three times without any instruction. Then, they participated in the acquisition phase in five training blocks, each containing ten throws. Subjects were given a three-minute break between each training block. During practice phase, the subjects in the instructional group were instructed to repeat the phrase "loop-goal" before each throw, while those in motivational group were instructed to repeat the phrase "I can" before each throw. The subjects in the control group performed the same protocol but without any instruction. One day after the acquisition test, the subjects took a retention test that included three throws. No instruction was provided before and during the retention test. In order to test Bandura self-efficacy theory, a Perception of Ability test was taken from adolescents with autism before pre-test and retention test. In this test, adolescents were asked to select a number from zero to 100 (with a 10-point interval) that indicated their perception of their ability to score 10 in subsequent throws.

2.3. Data analysis: We measured throwing accuracy in pre-test and retention test as dependent variables. We used one-way analysis of variance (ANOVA) to compare groups regarding the accuracy of throwing in pre-test and retention test. Tukey post hoc test was used as a post hoc test. The level of statistical significance was used at $P < 0.05$.

3. Results

The demographic characteristics of the subjects including age, height, weight, and BMI are presented in Table 1.

Table 1. Demographic characteristics of the subjects

Group	Age	Height	Weight	BMI
Instructional Self-talk	17.35±1.44	160.16±15.13	61.68±14.22	21.30±2.64
Motivational Self-talk	17.61±1.81	162.51±15.19	61.50±15.08	21.24±2.61
Control	16.94±1.90	165.73±15.78	60.28±15.90	21.72±2.73

Performances of the subjects in the pre-test and retention test is shown in Table 2 and Figure 1.

Table 2. Mean and standard deviation of Basketball throwing scores in pre-test and retention test

			Instructional Self-talk	Motivational Self-talk	Control
Throwing Score	Pretest	Mean	0.29	0.24	0.26
		SD	0.27	0.16	0.44
	Retention	Mean	0.69	0.71	0.32
		SD	0.73	0.71	0.62
Perception of Ability	Pretest	Mean	11.96	12.17	12.60
		SD	20.94	18.40	19.67
	Retention	Mean	41.89	38.47	20.44
		SD	24.09	20.71	16.06

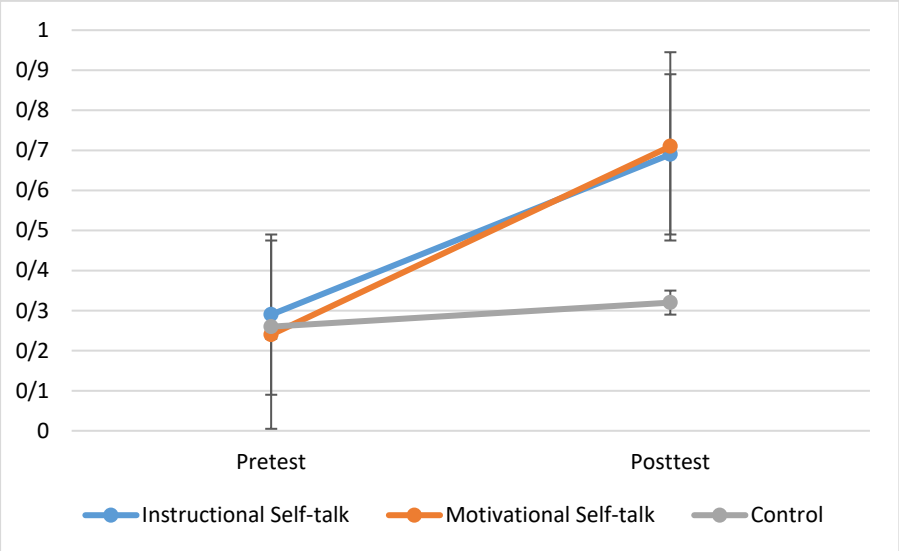

Figure 1. Means of throwing scores across groups

The results of analysis of variance in pre-test and retention test are given in Table 3.

Table 3. Results of analysis of variance in pre-test and retention test

	Group	Sum of Squares	df	Mean Square	F	Sig
Throwing Score	Pretest	64.15	2	29.99	0.62	0.861
	Retention	381.18	2	151.90	36.91	0.000
Perception of Ability	Pretest	33.10	2	30.08	0.82	0.710
	Retention	390.20	2	140.71	29.44	0.000

The results ANOVA revealed that the subjects had identical conditions before training, as we found no significant difference in throwing scores between the groups in the pre-test ($F = 0.62$, $p = 0.86$). However, in retention test, we found significant differences between groups ($F = 36.91$, $p < 0.001$). Tukey post hoc test demonstrated that both instructional and motivational self-talk groups performed better than the control group ($p < 0.001$). However, there was no significant difference between the instructional and motivational self-talk groups ($p > 0.05$).

Regarding perception of ability, the results showed that the subjects had same situation before entering to training, as we found no significant difference in perception of ability between the groups in the pre-test ($F = 0.82$, $p = 0.71$). Nevertheless, there were significant differences between groups in the retention test ($F = 29.44$, $p < 0.001$). Tukey post hoc test demonstrated that both instructional and motivational self-talk groups reported higher perception of ability than the control group ($p < 0.001$). However, there was no significant difference between the instructional and motivational self-talk groups ($p > 0.05$).

4. Discussion and Conclusion

The effect of self-talk on improving motor performance and learning in specific groups such as autism is unclear. The purpose of this study was, therefore, to examine the effects of instructional and motivational self-talk on learning a basketball shooting skill in adolescents with autism. The study hypothesized that adolescents with autism would be able to learn a Basketball throwing skill by using instructional and motivational self-talk. The results showed that adolescents with autism who used instructional and motivational self-talk performed significantly better on Basketball throw scores on the retention test than no-instruction control group. However, there was no significant difference between the instructional and motivational self-talk groups. These results show that adolescents with autism have been able to use instructional and motivational self-talk and have improved their post-test performance. The results of this study are indirectly consistent with the results of previous studies on the effect of self-talk on motor performance and learning in healthy individuals (Hatzigeorgiadis et al., 2008, 2009, 2011; Dana et al., 2011, 2012).

The second part of the study showed that in the retention test, adolescents with autism in the instructional and motivational self-talk groups showed higher perception of ability than the control group. This result is consistent with Bandura theory of self-efficacy (Bandura, 1997) and indicates that the reason for the effects of self-talk on motor performance is perception of ability. Bandura sees verbal encouragement as a source of perceived ability that has something to do with self-talk. Verbal encouragement on the part of the individual in the form of instructional self-talk can help increasing a sense of perceived ability while practicing and learning the skill. Previous research has also shown that increased perceived ability reduces anxiety and performance anxiety. Therefore, it seems that perceived ability facilitates learning by reducing self-focus.

To conclude, the results of this study demonstrate that people with autism benefit from self-talk to learn a new motor skill. This finding may indicate that these individuals have the mechanisms needed to learn new skills through self-talk, such as perceived ability. Future studies should focus on different motor tasks as well as other age groups.

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