

Original Article

The effects of instructional self-talk on girl's performance, retention and transfer of dart throwing in late childhood and adolescence

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Abstract

The purpose of this study was to examine the effects of instructional self-talk on the performance, retention and transfer of dart throwing in late childhood and adolescence. 100 students were randomly selected (50 students from 9-11 years old and 50 students from 15-17 years old) from volunteers for this purpose that none of them were not familiar with the skill of dart throwing. The subjects were randomly divided in to control and experimental groups. The subjects continued practice after 5 sessions of training that every session contained 7 blocks with 3 trails and they participated in the retention and transfer post-tests after 24 hours without practice. The collected data were classified by descriptive statistical methods and were analyzed by non-parametric methods (Wilcoxon and kruskal Wallis) and ($\alpha \leq 0/05$). The results showed that the instructional self-talk led to facilitate the acquisition, retention and transfer of dart throwing skill at both ages. Therefore, we can conclude that self-talk can be emphasize as a cognitive approach along with physical exercise by the coaches. Also, the results showed that there was a significant difference between performances of control group sand experimental groups in the retention test at both age categories while the control groups in comparison of experimental groups had better performance in transfer test than retention post-test at both age categories. The results of this study were discussed in effect of self-talk like feedback on performance.

Keywords: Instructional self-talk, performance, retention, transfer, dart throwing, childhood, adolescence.

Introduction

Today, the sport psychologists help the athletes' performance remarkable through using the different cognitive techniques Cognitive techniques are one of the appropriate methods of intervention to improve the athletes' performance (Anderson, 1997; Cumming et al., 2006; Klovlonis et al., 2011; Afsanepurak and Bahram, 2012). The researches shows that the using of cognitive strategies can increase the performance in sports (Hardy et al., 1996; Krane and Williams, 2006; Klovlonis et al., 2011) and knowing about the cognitive techniques can be beneficial in interpreting and moderating of the negative perception and thus in the improving of performance (Woods, 2007). Self-talk is one example of these techniques (Williams, 2001; Burton and Raedeke 2008; Hardy et al., 2009). Self-talk is as external and internal dialogues applied to offer instruction and reinforcement to performers during skill execution provides a versatile day-to-day performance aid (Chroni et al., 2007). Therefore, many coaches incorporate self-talk into their programs and theorists consider it as an integral part of psychological skill training programs (Hardy et al., 1996). Two major types of self-talk have been identified, namely instructional and motivational self-talk (Klovlonis et al., 2011). Instructional self-talk refers to statements designed to enhance performance by stimulating desired actions through focus of attention on the technical aspects of a skill. Motivational self-talk refers to statements designed to facilitate performance by building confidence, increasing effort and energy expenditure and creating a positive mood (Hardy et al., 1996; Theodorakis et al., 2000; Weinberg and Gould, 2007). In this regard, the studies have shown that self-talk is effective in the increasing of focus of attention (Landin, 1994; shank, 1986) the changing of focus of attention (Niedfer, 1976), and Shank, 1986 stated that self-talk is effective to focus the attention, the recalling information and encoding new information about the running task (Hardy, 2006; Zinsser et al., 2006). In addition to, self-talk helps the athletes, through the use of appropriate cue-words, to control and organize their thoughts, to focus on basic skill components, or to motivate themselves to exert more effort during practice (Zinsser et al., 2006). Rotella et al., (1980) and Ming & Martin (1996) stated respectively that the elite skiers who were more

successful than other opponents had benefited from more self-talk and the using of instructional self-talk can improve the acquisition of the skills on the ice.

Anderson et al., (1999) compared the three approach of teaching: instructional self-talk, traditional and the demonstration-only in the overhand throw in the elementary students and concluded that instructional self-talk is an appropriate strategy for teaching and learning the overhand throw. Also, Kolovelonis et al., (2011) studied the effect of instructional and motivational self-talk on students' motor task performance in physical education of elementary students. They expressed that self-talk is an effective technique for motor task performance enhancement in physical education. Theodorakis et al., (2000) and Chroni et al., (2007) examined the effects of motivational versus instructional self-talk on improving motor performance in adolescents and stated that when the task requires fine motor movements, an instructional self-talk strategy is more effective.

The instructional self-talk is helpful in the acquisition of tennis skill (Ziggler, 1987) and as one effective strategy for the acquisition of skill (Perkos et al., 2002) for the novice performers. Tsiggilis et al., (2003) studied the effect of instructional self-talk on performance of throwing skill in handball on 46 physical education students and expressed that there was no significant difference between control and instructional self-talk group in the performing of skill. Van Raalte et al., (1995) found that the positive self-talk group showed bad performance than control group and negative group in dart throwing. Goudas et al., (2006) investigated the effects of instructional self-talk on talk on standing long jump performance in the physical educations students and stated that physical education students did not improve significantly this performance using self-talk. Dana et al., (2011) examined the effect of instructional and motivational self-talk on performance and retention of discrete and continuous motor tasks in male physical education students that the discrete task was dart throwing in this research that the results showed that instructional self-talk had a significant and higher effect on dart throwing. But there is no significant difference between groups in retention test.

The review of researches shows that the athletes use the interaction of cognitive strategies for improving performance and achieving of success (Hanrahan et al., 1990; Thelwell and Greenlees, 2003; Brent, 2004; Mamassis and Doganis, 2004; Cumming et al., 2006). Today, with special attention to professional orientation process and the increasing of lifetime of athleticism, the analysis and using cognitive strategies such self-talk can be effective in this regard too. Also sports experts and sport teams are trying to improve the performance using different approaches especially using cognitive strategies in addition to physical fitness. Self-talk strategies have been examined in variety of sports performance such as basketball (Perkos et al, 2002; Chroni et al, 2007; Klovelonis et al., 2011), golf (Harvey, 2002), cricket (Holt, 2002; Slogrove et al., 2003), ice hockey (Rogerson and Hrycako, 2002), swimming (Wang et al., 2003), soccer (Papaioannou et al., 2004), tennis (Mamassis & Dogani, 2004), and water polo (Hatzigeorgiadis et al., 2004). The popularity of self-talk would seem to support the belief that it is in deed related to sport performance (Hamilton et al., 2007).

This study aims to investigate the effects of self-talk on the retention and transfer in dart throwing in addition to on performance of it in late of childhood and adolescence. The most of researches about the cognitive strategies were done in the adults, similarly about self-talk is one of the cognitive strategies especially about the effect of instructional self-talk on the retention and transfer of a skill in younger and lower ages. This study has paid to the relationship between the age and effect of instructional self-talk. Is there a question that the self-talk has effect on the children and adolescents' performance as the adult? It is possible that the effects of self-talk will be different on the performance, retention and transfer phase of a skill and the study has not been done in this area. Of course the domain and rang of researches is limited about that the effects of self-talk on the retention and transfer of a skill.

Materials and Methods

Method

The method of research was semi empirical and design of it included pre-test, post test with control group.

Participants

The statistical population of study was children 9-11 years old and adolescents 15-17 years old of girls' elementary schools and high schools in Maragheh city that they had not previous familiarity with the skill of dart throwing. From among the population, 100 students were randomly selected (50 students from 9-11 years old and 50 students from 15-17 years old) from volunteers. All the participants were in physical health and were not familiar with the skill of dart throwing. Also the subjects in each age category were selected close together in terms of weight and tall.

Instruments and tasks

The instruments were used in the study includes standard dart board (made in China, Model JB-D6-1, size: 1.2×18 inch) and standard darts (made in China, Model X-D3 with aluminum body). The scoring procedure is such that the darts hitting Bull's eye receive 100 scores, the darts landing on the circle 9 obtain 90 scores, the

hitting the circle 8 receive 8 scores, and so on and finally the darts to hit the circle 1 receive 10 scores. Of course for adolescents the dart board height from floor was set up according to federation rule (173cm) but for elementary students the dart board height from floor was set up according to their tall.

Procedure

The subjects of each age category were divided into control and experimental groups after the holding a training session by two qualified instructor and implementing of pre-test. The acquisition stage was included 5 training sessions and each session 7 blocks and each block 3 dart throwing for the all groups. The experimental groups used instructional self-talk the during of acquisition phase after each trail according to the guidelines set while the control groups did not benefit from instructional self-talk after each trail. In order to prevent any cognitive activities such as self-talk between trails were used the countdown method in all groups. All the subjects performed the retention and transfer post-tests after 48 hours of without training that the conditions of retention test was same with the conditions of acquisition stage but the conditions of transfer test was different in real the experimental groups did not use instructional self-talk but the control groups used it of course both post- test were held with 3 dart throwing. The subjects were asked to say “smooth and straight body” and “look at center of goal”.

Data analysis

In this study were used non-parametric methods (Wilcoxon and Kruskal Wallis) for data analysis due to the data was not normal in addition to the descriptive statistics and ($\alpha \leq 0.05$). Also was used the SPSS software, version 17 for data analysis.

Results

According to the descriptive statistics mean and standard deviation the subjects' age are 10.12 ± 0.82 for elementary students and 16.08 ± 0.81 for adolescent students. According to table 1, is observed that there was not the significant difference between the experimental and control groups in late of childhood ($P = 0.937$) and adolescence ($P = 0.984$) in the pre-test stage as a result, both groups in each age category are at a level in pre-test ($\alpha = 0.05$) and figure 1, shows the mean of points of dart throwing in 4 groups in the pre-test, acquisition, retention and transfer stage.

Table I. The results of Kruskal Wallis test for the determination of difference between performances of 4 groups in the pre-test.

Test Statistics^{a,b}

	Experimental & control groups Children	Experimental & control groups Adolescents
Chi-Square	.006	.000
df	1	1
Asymp. Sig.	.937	.984

a. Kruskal Wallis Test

b. Grouping Variable: VAR0000

Figure I. The mean of points of dart throwing in 4 groups in the pre-test, acquisition, retention and transfer stage.

There was observed the significant difference between the experimental and control groups in late of childhood ($P \leq 0.05$) and adolescence ($P \leq 0.05$) in all the sessions of the acquisition stage. In other words according figure 1, the experimental groups in both age groups has had better performance than the control groups in the acquisition stage (table 2).

Table II. The results of Kruskal Wallis test for the determination of difference between performances of 4 groups in the acquisition stage.
Test Statistics^{a,b}

	Late of Childhood						Adolescence					
	E* & C [#] Session 1	E* & C [#] Session 2		E* & C [#] Session 3		E* & C [#] Session 4	E* & C [#] Session 5	E* & C [#] Session 1	E* & C [#] Session 2	E* & C [#] Session 3	E* & C [#] Session 4	E* & C [#] Session 5
Chi-Square	10.854	12.465	10.495	29.413	33.586	3.979	5.636		11.900	9.001	11.308	
df	1	1	1	1	1	1	1		1	1	1	
Asymp. Sig.	.001	.000	.001	.000	.000	.046	.018		.001	.003	.001	

a. Kruskal Wallis Test *= Experimental group - # = Control group

b. Grouping Variable: VAR000

There was the significant difference between the experimental and control groups in late of childhood (P = 0.000) and adolescence (P = 0.000) in the retention stage and also between the experimental and control groups in late of childhood (P = 0.000) and adolescence (P = 0.000) in the transfer stage. In other words according figure 1, the experimental groups in both age groups has had better performance than the control groups in the retention and transfer test (Table 3).

Table III. The results of Kruskal Wallis test for the determination of difference between performances of 4 groups in the retention and transfer stage
Test Statistics^{a,b}

	Late of childhood		Adolescence			
	E* & C [#] Retention	E* & C [#] Transfer	E* & C [#] Retention	E* & C [#] Transfer	E* & C [#] Retention	E* & C [#] Transfer
Chi-Square			13.791		13.791	14.942
df			1		1	1
Asymp. Sig.			.000		.000	.000

a. Kruskal Wallis Test *= Experimental group - # = Control group

b. Grouping Variable: VAR00001

There was the significant difference between performance of experimental group in late childhood (P = 0.000) and also between performance of control group and experimental group of adolescent (P = 0.000) in the pre-test and retention test so the cognitive interventions have been effective. But there was no significant difference between performance of control group in the pre-test and retention test (P = 0.315), so instructional self-talk is an effective strategy for learning of dart throwing skill in late of childhood (Table 4).

Table IV. The results of Wilcoxon test for the determination of difference between pre-test and retention test, also between pre-test and transfer in the control and experimental groups of two age category
Test Statistics^c

	Late of childhood				Adolescence			
	Pre-test & Retention		Pre-test & Transfer		Pre-test & Retention		Pre-test & Transfer	
	C [#]	E*	C [#]	E*	C [#]	E*	C [#]	E*
Z	-1.005 ^a	-4.236 ^a	-1.900 ^a	-3.877 ^a	-3.930 ^a	-4.297 ^a	-4.339 ^a	-3.848 ^a
Asymp. Sig. (2-tailed)	.315	.000	.057	.000	.000	.000	.000	.000

- a. Based on negative ranks. * = Experimental group - # = Control group
b. Based on positive ranks.
c. Wilcoxon Signed Ranks Test

There was not a significant difference between performance of control groups in the retention and transfer test (P = 0.254), while there was the significant difference between performance of control group in late of childhood (P = 0.003) and also between performance of control group and experimental group of adolescent (P ≤ 0.05) in the pre-test and retention test. Of course according figure 1, was observed that the control group has been better performance with little difference in comparison with experimental group in transfer test than retention test. Also the control group has been better performance than experimental group in transfer test. These findings can imply that if self-talk was applied very much it can be very dependent such as feedback because the experimental groups did not use instructional self-talk in the transfer test but the control groups used it in the transfer test (Table 5).

Table V. The results of Wilcoxon test for the determination of difference between retention and transfer test, in the control and experimental groups of two age category
Test Statistics^c

	Late of childhood		Adolescence	
	Control	Experimental	Control	Experimental
Z	-1.140 ^a	-2.998 ^b	-3.857 ^a	-3.437 ^b
Asymp. Sig. (2-tailed)	.254	.003	.000	.001

- a. Based on negative ranks.
b. Based on positive ranks.
c. Wilcoxon Signed Ranks Test

Discussion and Conclusion

As you have observed, the effect of instructional self-talk has been useful for dart throwing in late of childhood and adolescence. This finding is consistent with finding of Theodorakis et al., 2000 and Chroni et al., 2007 that stated instructional self-talk is effective for fine tasks (Theodorakis et al., 2000 and Chroni et al., 2007), in this study dart throwing is a fine task and also with finding of Ziegler, 1987 and Perkios et al., 2002 that expressed instructional self-talk is helpful in the acquisition of tennis skill for the novice performers (Ziegler, 1987; Perkios et al., 2002), in this study the subjects were novice too. In addition to, this finding is consistent with the finding of Dana et al., s 2011 study that showed instructional self-talk had a significant and higher effect on dart throwing as a discrete task, task of this study is a discrete task (Dana et al., 2011). In addition to, it can expressed that according Landing (1994) , Shank (1986), and Zinsser et al., (2006) instructional self-talk is effective due to dart throwing is a task that requires high focus and attention so using of instructional self-talk might have helped the subjects' focus on task and has improved their performance.

The results showed that the instructional self-talk is essential strategy for learning of dart throwing skill this finding is consistent with finding of Anderson et al., 1999 and Kolovelonis et al., 2011 that stated results of study stated self-talk is an effective technique for the acquisition of skill and motor task performance enhancement in the elementary students (Anderson et al., 1999; Kloveionis et al., 2011).

These findings are conflict with the result of Tsiggilis et al., s 2003 study that expressed there was no significant difference between control and instructional self-talk group in the performing of skill (Tsiggilis et al., 2003), the finding of Goudas et al., 2006 that stated physical education students did not improve significantly this performance using self-talk (Goudas et al., 2006), and the result of Van Raalte et al., s 1995 study that found the positive self-talk group showed bad performance than control group and negative group in dart throwing (Van Raalte et al., 2000).. Perhaps, lake of consistent of Tsiggilis and Goudas's study with this study is due to differences in the subjects' nature, age, and level, the kind of self-talk and the kind and level of skill.

The results of this study showed that the there was the significant difference between the performance of experimental and control groups in the retention test in both age category, This finding is conflict with the finding of Dana et al., s 2011 study that showed there was no significant difference between groups in retention test (Dana et al., s 2011). Perhaps, lake of consistent of Dana's study with this study is due to differences of the subject's gender, level or age, type of phrases of instructional self-talk and number of sessions of training.

The interesting finding of this study is better performance of control in the transfer test in both age categories. In this study the experimental groups did not use instructional self-talk in the transfer test but the control groups used it. It can be imply that if self-talk was applied very much it can be very dependent such as feedback and the athlete's performance will decline with omitting it. So it is required more researches to examine the effects of kinds of self-talk on other skills for transfers and retention test and the future researches can examine the effects of frequency of self-talk.

According to the results of this study, we can conclude that the instructional self-talk can apply for both age categories as a cognitive strategies. Therefore, the sports and rehabilitation professionals and coaches can use it in the planing of training and in the instruction of fine skills like dart throwing along with physical training. Although it should be noted that the instructional self-talk had more effect in adolescence and perhaps the its reason is due to the adolescents's cognitive capacities.

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