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EFFECTIVENESS OF DART GAME IN IMPROVING EYE-HAND COORDINATION AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract

This study investigated the effect of a specially designed dart game intervention on improving eye-hand coordination in children with autism spectrum disorder (ASD). Eye-hand coordination challenges are commonly observed in individuals with ASD, affecting their daily activities and social interactions. The present study focused on a sample of five children with ASD to explore the potential benefits of a dart game intervention in addressing their coordination difficulties. The Quantitative measurements and qualitative observation both were applied to assess the effectiveness of the intervention. The intervention involved regular sessions of playing a dart game to target and enhance eye-hand coordination skills. Quantitative assessments included standardized tests and measurements tailored to the unique characteristics of the ASD population, evaluating improvements in precision, accuracy, and reaction time. In addition to this, observation of the participant's engagement with the dart game, documenting changes in motor planning, attention, and overall coordination during the intervention sessions was also made. Preliminary findings suggested a positive correlation between the Dart game intervention and improvement in eye-hand coordination among the participants with ASD. The study contributed to the growing body of literature on interventions for individuals with ASD, offering a novel approach to address specific challenges related to eye-hand coordination.

Introduction

Autism spectrum disorder (ASD) is a developmental disability that can cause significant social, communication, and behavioral challenges. The term "Spectrum" refers to the wide range of symptoms, skills, and levels of impairment that people with ASD can have. ASD affects people in different ways and can range from mild to severe. People with ASD face behaviour issues, Eye-hand coordination, sensory issues, and difficulties with social interaction, but variations are there depending on when the symptoms start, how severe they are, the number of symptoms, and whether other problems are present. The symptoms and their severity can change over time. The behavioral signs of ASD often appear early in development. Many children show symptoms by 12 months to 18 months of age or earlier (NIDCD, 1988). Autism spectrum disorders are complex Neurodevelopmental disorders characterized by qualitative impairments in three domains: social interaction, communication, and repetitive, stereotyped behaviour.

Characteristics of Autism

People with ASD have serious impairment in social, emotional, and communication skills. They might repeat certain behaviours again and again and might have trouble changing their daily routine.

Autism shows the core feature of the triad of impairment in varying degrees. These include:

- Persistent difficulties with social communication

- Persistent difficulties with social interaction
- Rigid and repetitive behavior, resistance to change, or narrow interests.

Sensory Dysfunctions

The senses provide information about ourselves and our environment that affects thinking both at the structural and content level. The presence of sensory disturbances in persons with ASD is widely acknowledged. Sensory dysfunctions observed in individuals with ASD vary widely across sensory modalities which include visual, auditory, olfactory, tactile, and gustatory hypersensitivities and hypo sensitivities.

Theory of Mind

Theory of mind may take a little longer to develop in children with developmental disabilities, such as those with autism spectrum disorders, and moreover, some higher-level skills may not be attained at all. Youth with autism (age group 5 to 13 years) scored lower than typically developing youth on measures of understanding others' beliefs and emotions, but there were no differences in understanding others' intentions (Mazz et al, 2017) because understanding intentions is a less complex skill that develops earlier than understanding beliefs and emotions. Theory of Mind definitely plays a role in the presentation of developmental delays, with disparities extending throughout middle childhood and even adolescence between those with delays and normally developing individuals. Understanding theory of mind may allow us to not only better diagnose those who are delayed, but also to design more effective interventions to encourage and support developmental progress. False-belief understanding has been linked to various aspects of social functioning, including the ability to engage in meaningful conversations, resolve conflicts, maintain intimacy in friendships, and overall social competence as rated by teachers (Astington,2003).

Social skills

Social skills are the skills we use to communicate and interact with each other, both verbally and non-verbally, through gestures, body language, and our personal appearance. Human beings are sociable creatures and we have developed many ways to communicate our messages, thoughts, and feelings with others. The main characteristics of social skills are goal–goal-directedness, and their interrelation in the sense that one person may use more than one kind of behavior at the same time, for the same goal.

Eye-hand coordination among Children with Autism Spectrum Disorder

The control of everyday movements such as reaching, grasping, walking, gaze direction, etc., involves the concerted activity of neurocognitive processes, sensory processes, and reflexes. Ongoing movements are planned, initiated, guided, monitored, and adjusted to accommodate environmental contingencies. ASD children show less efficient Eye-hand coordination, which was particularly evident

when pointing toward a target was being fixated. The data of normally developing participants confirmed that manual gap effects are more likely for more complex hand movements.

Recreational activity

Physical activity, recreation, and time spent outdoors are vital parts of a healthy lifestyle. Not only do recreational activities provide great exercise, but they also have the potential to be engaging activities that can help you center yourself, clear your mind, or bond with friends and family. From the physical benefits to the mood-boosting and mental advantages, there is strong evidence that recreational activities are great for your mind, body, and soul. Regular Activities keep body flexibility, muscle tone, and strength in this context. There are so many recreational activities outdoors and indoors, which can help children with ASD to improve their Eye-hand coordination. Recreational activities for persons with special needs could include Aquatics, Archery, Graphic Arts, Aviation, Skydiving, Baseball, Basketball, Bowling, Camping, Tennis, Fishing, Hiking, Exercise, Training, Gardening, Writing, Fencing, Frisbee, Horseback Riding, Golf, Game of darts, Arts and Crafts, Motorcycle Riding, Jogging, Martial Arts, Skiing (Water and Snow), Music, Photography, and Swimming etc.

Game of Dart

The name of the game "Dart" took place from a French word named "butt" which means target. In earlier days, the soldiers used to practice targets by throwing short arrows towards the bottom of the tree or the cask. Soon after the drying of the wood, it used to create punching spots around there. With the passage of time, the woodworkers worked on that and made wood darts to be used in local pubs. The tip of the dart should always face up. The grip should not be so tight that it will make the person dart face downward as it will hamper your accuracy. The eye should make a straight line between the tip of the dart and the person's aim before releasing it. While holding the dart individual should nettle grip too tight or too loose. A relaxing and firm grip is needed. It is always necessary for an individual to find the center of gravity of the dart Place the dart on the individual palm and with a non-throwing hand slide it towards fingers to hold it.

Dart Board

A fine-quality board consists of sisal fibers or boar bristles and cork. An 18-inch diameter board is divided into 20 sections. Thin metal structures are used to design the dividing lines and with the same materials, the numbers are designed. Sometimes the manufacturers opt for printing number formats. The board should be positioned on the wall in such a manner that the **bull's eye** should be 5ft 8 inches above the floor. There must be a **marking line** behind which the player will stand. That line should be at a distance of 7 feet and 9.25 inches from the face of the Dart board.

Darts

The four main parts of a dart are:

1. The point

2. The shaft
3. The grip
4. The flight

Standing Posture

People often neglect the standing posture but it is the first thing that is going to set the base of a winning chance. Always draw an imaginary line from the bull's eye of the dart towards the line of throwing. Mark it over there with a color. Stand with such a posture that there will be a shoulder's distance between your two feet. The front foot should bear more weight of your body than the back foot. This improves balance and accuracy but too much leaning forward may cause back injuries. The position of one individual arm should be parallel to the ground. Sometimes, it varies between 50-90 degrees varying from person to person but the shoulders should stay fixed with respect to other parts of the body.

Gripping Techniques

There is no hard and fast rule about the gripping techniques in darts. The gripping depends upon the two things-

- The barrel of the dart
- The finger positioning that makes you comfortable.

Throwing Techniques

The art of throwing is the most important aspect of this whole game. Yet most people underestimate this. Without giving a close analysis people throw the darts like throwing stones into the river. Some people lean forward, some go back and forth, and some even throw quickly without giving it a second thought. Alignment is the most important thing that should align in such a manner that hands, shoulders, and elbow remains in a straight line. Movement of elbows to much left or right may cause mechanical imbalance. However; a small variation of elbows may be used depending on personal preferences. Your throwing should be just like swinging a hammer. Use your shoulder for farm support and use your wrist and hand to boost his speed. While extending your arm make sure your elbow goes to the optimum height to give the necessary kinetic force to the dart. A clear illustrating picture is given below. At the beginning of the throw, it is advisable to hold the dart sideways maintaining the right level. Leaning and swaying is not a good idea. It makes your target not only small but also movable which in turn makes it difficult for you to hit the required target. Seems like, we have gathered some basic knowledge upon throwing darts. Now let's learn some techniques about aiming.

Aiming Techniques

A successful throw depends upon many factors and a good aim top that list. Aiming has different techniques. Some people use **line of sight** method which has proved to be helpful in many cases. In this method an individual can aim the target with either any of the following-

- The first or second knuckle of your throwing hand's thumb
- The tip of the dart
- A small finger of the throwing hand

Some people try to aim the target with either the right or left eye but this is indeed a lazy practice. Another thing that is often advised is to identify the dominant eye. Try to throw the darts at the board by closing each of your eyes separately. The suggestion is to use the eye which one can find difficult to close to get the best results.

Effects of game of Dart

1. Improves Eye-hand Coordination
2. Works the Brain
3. Stress Relief
4. Social Skills
5. Improves Concentration
6. Increases Confidence
7. Physical Self Control
8. Exercise
9. Encourages strategic thinking
10. Teamwork.

Statement of the Problem

EFFECTIVENESS OF DART GAME IN IMPROVING EYE-HAND COORDINATION AMONG CHILDREN WITH AUTISM SPECTRUM DISORDER

Objectives of the study

The objectives of the present study are as follows:

- To investigate the effect of a game of darts in improving Eye-hand coordination for children with autism spectrum disorder.
- To compare the effect of a game of darts in improving Eye-hand coordination among children with autism spectrum disorder with respect to age and locality.

Hypothesis:

1. There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts.

2. There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to their age

3. There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to their locality.

Delimitation

The present study was delimited to the children with Autism Spectrum Disorder from one special school and the sample size of five students only.

Methodology

Sample

Five children with autism spectrum disorders individuals who attend an NIEPMD model school and Special Education served as participants and were selected using a purposive sampling technique. The center offers self-help, social/communication, and vocational skill training to severely and profoundly handicapped persons between 6 and 14 years of age. The darts skill leisure training program was initiated in the special education service within the campus.

Demographic details of the data

Participants	Age	Criteria	Locality
Subject 1	9	ASD	rural
Subject 2	6	ASD	urban
Subject 3	11	ASD	urban
Subject 4	13	ASD	rural
Subject 5	14	ASD	rural

Inclusion criteria

The children who met the ICD-10 criteria for the diagnosis of autism spectrum disorder and ID and those attending special school were included.

Exclusion criteria

The children with serious physical, and mental problems, and children with chronic neurological conditions such as cerebral palsy, epilepsy, etc. were excluded.

Tools used for data collection

The researcher developed a Pre-requisite rating scale to observe the pre-requisite skills of children with Autism Spectrum Disorder to be used as both pre-test and post-test. The validity of the tool was established by the Experts working in the field of special education. The reliability of the tool was calculated through Cronbach alpha ‘r’ valued at. 0.628. The observation schedule was prepared to record the performance of subjects during the intervention.

Procedure

The prior informed consent was obtained from the parents to ensure the participation of the subject in the study. Parents were explained about the purpose of the study, intervention plan, and expected outcome in their regional language. The test procedure was explained and demonstrated in detail. Pre-

test score was collected using direct observation of the subject taken in the study before the intervention. After three months of intervention, a post-test was given and the difference between pre-test and post-test scores was calculated using statistical techniques.

Intervention

The intervention for a period of three months- three days a week was given. The intervention was given to the selected sample for about 30 minutes per day. Initially, the intervention was given to improve the skill of throwing. After that task analysis was included. Through this intervention program, children were made aware of their social skills, communication skills, greeting others, etc. Appropriate coordination and object manipulation were used in the game for their active involvement.

Initially, a non-reinforced baseline was conducted to determine pre-instruction (PRE-TEST) competency levels. The baseline level for each participant was derived by giving the verbal cue (i.e., " subject 1, subject 2, subject 3, subject 4, subject 5, throw the darts at the board."), and recording the steps of the scoring sheet (15 items) performed correctly and with assistance. Subjects 1,2,3,4,5 with autism spectrum disorder, were assessed in 30 sessions (Intervention) respectively. The general verbal cue was given and the number of steps performed independently was recorded. Instruction began on the next step of the task analysis which had not been performed correctly or without assistance during two consecutive sessions. An instructional cue hierarchy (Horner & Keilitz, 1975) was used to teach the dart skills.

This entailed initially administering the verbal cue for the step being trained (e.g., step (b)- "subject 1, grasp the dart."') and socially reinforcing the participant for appropriate behaviour. If the verbal prompt did not lead to the desired response, the second stage of the teaching hierarchy was implemented. This included giving verbal cues and concurrently modelling the correct behavior. The subject was then verbally prompted to try again (e.g., "Subject 1, now you try."). If the targeted behavior was then exhibited, the player was socially reinforced. Finally, if the participant again failed to perform, the instructor physically prompted the individual through the appropriate action, while once again giving the verbal cue. Praise was provided continuously following this hierarchical step. Reinforcement consisted of social praise, pats on the back, and extra attention. Training continued for each participant until he or she was capable of performing all seven steps of the task analysis during two consecutive sessions. Generalization probes, in the absence of prompts and reinforcement, were performed in one other environment for all participants.

Intervention method

The objective of the dart skills was for each participant to throw three darts (3 TERM) and to strike the dart board successfully on each toss from the standard 10 ft (3M). distance. Criteria for mastery consisted of 100% completion of the 7-step task analysis for two consecutive sessions. An additional objective of the program was to generalize dart throwing performance to 2 other environments (i.e.,

classroom setting and resource room set up) and across time (i.e., 3-month follow-up). The goal of the generalization probes was to demonstrate criterion-level performance in several environments using physical prompts, verbal prompts, gesture prompts, and cue prompts. Given a dart board at standard height and three darts, the participants will strike the dartboard from the standard 10 ft (3m) distance, 100% of the time. The original verbal cue given to each participant was "(subject 1, subject 2, subject 3, subject 4, subject 5), throw the darts at the board." The seven steps of the task analysis in the correct sequence were

(a) stand/sit 10' from the dartboard, (INITIAL 1m, NEXT 2m, FINALLY 3m)

(b) Grasp the first dart in the dominant hand (tip of dart facing board) using a pincer grasp,

(c) Bend elbow until forearm is perpendicular to ground,

(d) Thrust forearm and hand in forward motion toward the board, releasing dart when the arm is extended,

(e) First dart strikes dartboard,

(f) Throw a second dart, striking dart board, and

(g) Throw the third dart, striking the dart board.

Analysis and Interpretation of Data

Hypothesis 1 “There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts”.

Table 1 Significance of Difference between means of pre-test and post-test scores representing improvement in Eye-hand coordination among children with autism spectrum disorder through the game of darts

Domain	N	Mean	S.D	‘t’ value
Pretest	5	38.20	1.483	17.493
Posttest	5	48.40	1.817	

Table 1 shows that the pre-test mean score is 38.20 and the post-test mean score is 48.40. The t value is 17.489 and the p value is 0.00 which is significant at 0.01 level of significance. Therefore, hypothesis 1, “There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts” is rejected. Hence, it can be concluded that a game of darts improves Eye-hand coordination among children with Autism Spectrum Disorder.

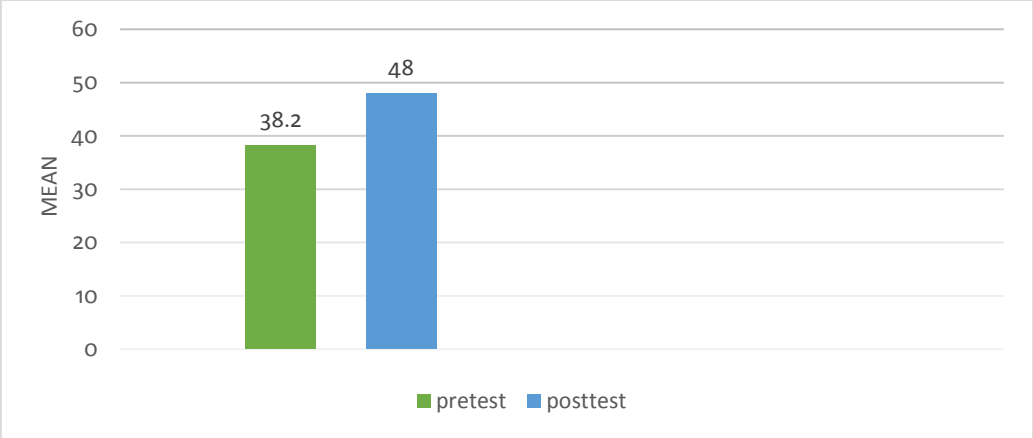

Figure 1 Pre-test and Post-test Mean scores of children with Autism Spectrum Disorder

Figure 1 represents that the post-test means scores are 48 which is greater than the pre-test means scores i.e. 38.2. this clearly represents the improvement in Eye-hand coordination among children with autism spectrum disorder through the game of darts.

Hypothesis 2: There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to their age

Table 2 Significance of Difference between means of pre-test and post-test scores representing improvement in Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to age group

	Age	N	Mean	S.D.	df	't' value
Pretest	Below 10	2	38.5	0.7	3	0.326
	Above 10	3	38.0	2.0	2.6	
Posttest	Below 10	2	48.5	2.1	3	0.104
	Above 10	3	48.3	2.1	2.2	

From Table 2, it is found that the mean pre-test scores of children with autism spectrum disorder below the age of 10 years and above the age group of 10 years with regard to Eye-hand coordination are 38.5 and 38.0 respectively. The t value is calculated as 0.326 which is not significant even at 0.05 level of significance. The mean post-test scores of children with autism spectrum disorder below the age of 10 years and above the age group of 10 years with regard to Eye-hand coordination are 48.5 and 48.3 respectively. The t value is calculated as 0.104 which is not significant even at 0.05 level of significance. Therefore, null hypothesis 2, "There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to their age" is not rejected. It can be concluded that there is no significant difference in varying age groups of children with autism spectrum disorder in learning Eye-hand coordination.

Hypothesis 3: There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to their locality

Table 3 Significance of Difference between means of pre-test and post-test scores representing improvement in Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to locality

	Locality	N	Mean	S.D	't' value
Pre-test	Rural	3	41	3.6	1.44
	Urban	2	37	1.4	
Post-test	Rural	3	49.6	0.5	5.927
	Urban	2	46.5	0.7	

From Table 3, it is found that the mean pre-test scores of children with autism spectrum disorder from rural areas and urban areas with regard to Eye-hand coordination are 41 and 37.0 respectively. The t value is calculated as 1.44 which is not significant even at 0.05 level of significance. The mean post-test scores of children with autism spectrum disorder from rural areas and urban areas with regard to Eye-hand coordination are 49.6 and 46.5 respectively. The t value is calculated as 5.927 which is significant at 0.01 level of significance. Therefore, the null hypothesis 3, "There is no significant difference in improving Eye-hand coordination among children with autism spectrum disorder through the game of darts with respect to locality" is rejected. Therefore, is significant difference in improving Eye-hand coordination for children with autism spectrum disorder with respect to locality. The improvement in eye-hand coordination in rural students was more in comparison to urban students.

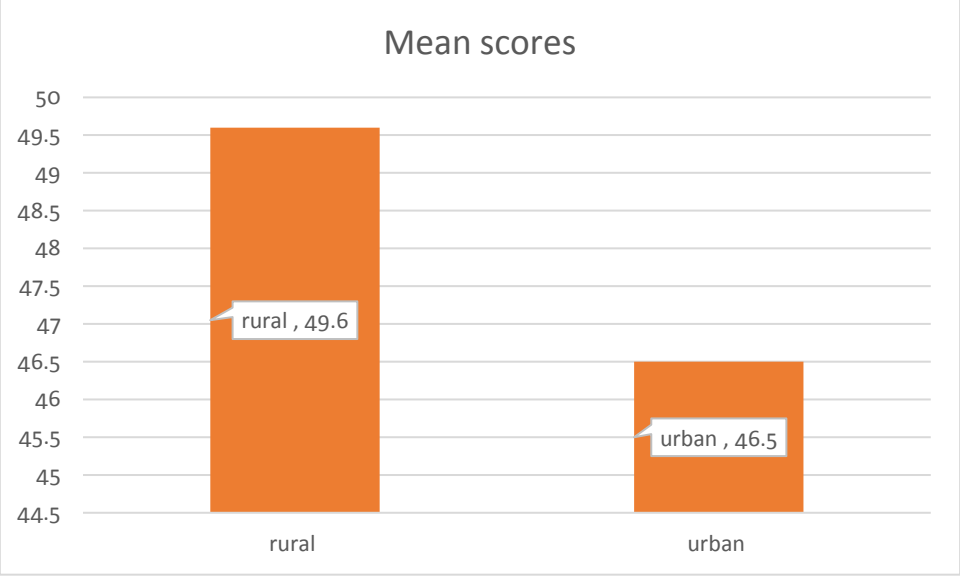

Figure 2 Post-test Mean scores of children with Autism Spectrum Disorder with respect to their locality

Figure 2 represents that the post-test means scores of students from rural background are 49.6 which is greater than the post-test means scores of students from urban areas i.e. 46.5. This clearly represents

the improvement in Eye-hand coordination among children with autism spectrum disorder from rural background was more in comparison to children with autism spectrum disorder from urban background through the game of darts.

Discussion and findings

The major findings of the study were to

1. Game of Dart improves the Eye-hand coordination of children with autism spectrum disorder. The intervention given after the pretest was helpful in improving their performance in the game of darts.
2. It is inferred that the game of darts did not influence children with autism spectrum disorder's ability to improve their Eye-hand coordination based on their age group but significant difference was found with respect to locality.

Conclusion

The Present study concluded that game of darts training intervention improves Eye-hand coordination among children with autism spectrum disorder. Further, this intervention helps in increasing concentration, socialization skills, and communication. This can be extended in academic areas for improvement in learning mathematics. Eye-hand coordination is a skill that necessarily coincides with children at an early age development. This research study has a baseline for further research to enhance visual motor skills as it is beneficial to children with ASD for their overall development.

References

Amado Sanchez, V. L., Islas Cruz, O. I., Ahumada Solorza, E. A., Encinas Monroy, I. A., Caro, K., & Castro, L. A. (2017). BeeSmart: A Gesture-Based Videogame to Support Literacy and Eye-hand Coordination of Children with Down Syndrome. Games and Learning Alliance, 43–53. doi:10.1007/978-3-319-71940-5_4. Retrieved from https://sci-hub.do/10.1007%2F978-3-319-71940-5_4

Badan, M., Hauert, C.-A., & Mounoud, P. (2000). Sequential Pointing in Children and Adults. Journal of Experimental Child Psychology, 75(1), 43–69. doi:10.1006/jecp.1999.2522. Retrieved from https://sci-hub.se/10.1006/jecp.1999.2522

Binsted, G., Chua, R., Helsen, W., & Elliott, D. (2001). Eye–hand coordination in goal-directed aiming. Human Movement Science, 20(4-5), 563–585. doi:10.1016/s0167-9457(01)00068-9. Retrieved from https://sci-hub.se/10.1016/s0167-9457(01)00068-9

Carmody, D. P. (2001). Child Psychiatry and Human Development, 31(3), 233–247. doi:10.1023/a:1026481422227. Retrieved from https://sci-hub.do/10.1023%2Fa%3A1026481422227

Crippa, A., Forti, S., Perego, P., & Molteni, M. (2012). Eye-hand Coordination in Children with High Functioning Autism and Asperger's Disorder Using a Gap-Overlap Paradigm. Journal of Autism and Developmental Disorders, 43(4), 841–850. doi:10.1007/s10803-012-1623-8. Retrieved from https://sci-hub.se/10.1007/s10803-012-1623-8

Grigore, V., Mitrache, G., Predoiu, R., & Roşca, R. (2012). Characteristic of instrumental movements – Eye-hand coordination in sports. Procedia - Social and Behavioral Sciences, 33, 193–197. doi:10.1016/j.sbspro.2012.01.110. Retrieved from https://sci-hub.se/10.1016/j.sbspro.2012.01.110

Idris, TgMalim, Perak. The effect of different focus of attention on throwing skills among autism spectrum disorder, Pulau Pinang Education Department, Bukit. Retrieved from https://sci-hub.se/10.4314/jfas.v9i6s.96

Johansson, R. S., Westling, G., Bäckström, A., & Flanagan, J. R. (2001). Eye–Hand Coordination in Object Manipulation. The Journal of Neuroscience, 21(17), 6917–6932. doi:10.1523/jneurosci.21-17-06917.2001. Retrieved from https://sci-hub.se/10.1523/JNEUROSCI.21-17-06917.2001

Lazzari, S., Mottet, D., & et al, J.-L. (2009). Eye-hand Coordination in Rhythmical Pointing. Journal of Motor Behavior, 41(4), 294–304. doi:10.3200/jmbr.41.4.294-304. Retrieved from https://sci-hub.se/10.3200/jmbr.41.4.294-304

Masia, L., Casadio, M., & et al, P. (2009). Eye-hand Coordination during Dynamic Visuomotor Rotations. PLoS ONE, 4(9), e7004. doi:10.1371/journal.pone.0007004. Retrieved from https://sci-hub.se/10.1371/journal.pone.0007004

Rienhoff, R., Hopwood, M. J., Fischer, L., Strauss, B., Baker, J., & Schorer, J. (2013). Transfer of motor and perceptual skills from basketball to darts. Frontiers in Psychology, 4. doi:10.3389/fpsyg.2013.00593. Retrieved from https://sci-hub.se/10.3389/fpsyg.2013.00593

Schleien, S. J., Wehman, P., & Kiernan, J. (1981). Teaching leisure skills to severely handicapped adults: an age-appropriate darts game. Journal of Applied Behavior Analysis, 14(4), 513–519. doi:10.1901/jaba.1981.14-513. Retrieved from https://sci-hub.se/10.1901/jaba.1981.14-513

Smirnov, A. S., Alikovskaia, T. A., Ermakov, P. N., Khoroshikh, P. P., Fadeev, K. A., Sergievich, A. A., … Golokhvast, K. S. (2019). Dart Throwing with the Open and Closed Eyes: Kinematic Analysis. Computational and Mathematical Methods in Medicine, 2019, 1–10. doi:10.1155/2019/4217491

Szabo, Neagu, Sopa Eye-hand relationship of proprioceptive motor control and coordination in children 10–11 years old: Vol. 21, no. 3 , 2020, 185–19. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/64857479/11_szabo_185_191.pdf?1604562172=&responsecontentdisposition=inline%3B+filename%3DEye_hand_relationship_of_proprioceptive.pdf&Expires=1625734836&Signature=XplBcHL2fZgcpA8N7Sj1OEQ8gviErvxH2nc7VXDQrjg5Hjpp5FGGwGoFcUMa2S99tV8xTHFJE0PqwK8BynMpcun2X0gm19ONn9aKrTDFQ3kdzaAjtE2n0vHBVFB3MAlqcJfMubrH6dgbLIlN171qQJkP7dWRLiVLL9Pc6BvbKmRj33RCUWvvGDTeSyCgQ11BeTYqV8p2MaAPWUhEXEYtw~9jiw74JNE8iuZ7f37BRpmytqOdJXNeccptVlaeVWbwb4Ls11rXhWfSA0f6KTPfFyVt8zkH2ue67gtj4pGK0U~g98hOm9mud5jnyYUtVCEf3McYeqV233YTyPOdjkg__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA

Van der Loo, J., Krahmer, E., & van Amelsvoort, M. (2020). Learning How to Throw Darts. Effects of Modeling Type and Reflection on Novices' Dart-Throwing Skills. Journal of Motor Behavior, 1–12. doi:10.1080/00222895.2020.1732861. Retrieved from https://sci-hub.se/10.1080/00222895.2020.1732861

Wu, J., Chan, J. S. Y., & Yan, J. H. (2018). Movement Segmentation and Visual Perturbation Increase Developmental Differences in Motor Control and Learning. Developmental Science, e12789. doi:10.1111/desc.12789. Retrieved from https://sci-hub.se/10.1111/desc.12789