



Petanque: Mental Training and Kinesthetic Perception of Shooting Accuracy

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Abstract

This study aims to determine 1) the difference in the effect of mental imagery training with mental autogenic training on shooting accuracy in petanque sports, 2) the effect of kinesthetic perception on shooting accuracy in petanque sports, 3) the interaction between mental training and kinaesthetic perception on shooting accuracy in petanque sports. The research method used is the experimental method. The data was collected using perception tests and shooting accuracy tests, while the instruments used were shooting tests from FIPJP (Fédération Internationale de Pétanque et Jeu Provençal). Data analysis using ANAVA analysis. The results of this study are 1) Mental imagery training has a greater effect than mental autogenic training on shooting accuracy in Petanque sports, 2) There is an effect of kinesthetics perception on shooting accuracy in Petanque sports, 3) There is an interaction between mental training and kinaesthetic perception of accuracy shooting in petanque sport. So the conclusion of this study, to obtain high accuracy of shooting Petanque, athletes who have high kinesthetic perception should be selected, supported by programmed imagery training.

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INTRODUCTION

Petanque sports began to enter Indonesia in 2011, and in 2016 petanque sports began to enter West Java, with a total of 6 District and City Administrators (Bekasi City, Tasikmalaya City, Tasikmalaya Regency, Cimahi City, Sumedang Regency and Depok City). Whereas in 2020 the number of petanque districts / groups has begun to increase to 17. Seeing these developments, it can be said that the petanque sport has begun to be widely played and recognized by the Indonesian people, even this one sport has been able to contribute achievements in prestigious sports events in SEA. GAMES 2015 in Singapore (Sutrisna, Asmawi, & Pelana, 2018). One of the goals of this sport is to throw an iron ball close to a wooden ball and this game can be played on hard ground, sand and grass (Gustopo Bayu Lakšana, 2017). (Eko Cahyono, 2018) This sport can be played as triple man and woman, double man and women, shooting, and pointing.

The shooting technique in the single, double and triple game numbers is principally to throw an iron ball to approach the wooden ball and keep the opponent's iron ball away from the wooden ball (Syahrudin Warta Kusuma Cucu Pradana, n.d.); (Souef, 2015). While in the shooting number in the precision game an athlete throws 4 times with a distance of 6.5; 7.5; 8.5 and 9.5 meters, with the calculation of points 0, 1, 3, or 5 for successful shooting (Agustina & Priambodo, 2017). Seeing this, an athlete in the precision shooting number is required to throw the right shot at the target and to achieve that needs to be supported by the ability in the form of accuracy or accuracy (Hermawan, 2012); (Souef, 2015). The result of shooting in Petanque sports is not optimal due to the low mental ability of the athlete when shooting, the negative impact of the athlete's unpreparedness will have an impact on the accuracy results. There are many ways that a coach can do for athletes to improve shooting accuracy, including by intervening mental training (Nurfalah, Ugelta, & Imanudin, 2016). Mental training carried out by a petanque athlete can have an impact on improving performance such as shooting accuracy (Zhang Li-Wei, Ma Qi-Wei, 1992; Thomas D. Patrick and Dennis W. Hrycaiko & More, 2018); focus or attention on a moment (Lutz et al., 2009); (Gunaratana H, 2002); help regulate anxiety and increase the confidence of adult athletes (Mamassis & Doganis, 2004); even imagery training can improve the motor skills of athletes (Weinberg, R., Butt, J., Knight, B., Burke, K. L., 2003; Caliarì, 2008). There

are many ways to achieve this, including doing mental imagery training exercises (Knäuper, Roseman, Johnson, & Krantz, 2009; Guarnera, Faraci, Commodari, & Buccheri, 2017; Fontani et al., 2007; Campos, González, Dopico, & Iglesias, 2001). In addition to imagery training, another form of mental training that can be done is mental autogenic training which can be done by athletes to improve shooting skills (Candau, Grappe, Dugué, & Rouillon, 2003; Blumenstein, Bar-Eli, & Tenenbaum, 1995; Katsura & Kojima, 1982); (Chitra Dhiman, 2010). Kanji (1997) states that mental autogenic training is a form of mental exercise that focuses more on oneself by utilizing a more passive concentration of stimuli that an athlete receives and adapts psychologically. This autogenic training can provide benefits in the form of reducing stress levels in athletes which in turn can increase accuracy (Ernst & Kanji, 2000).

Of the two methods, both imagery training (IT) and autogenic training (AT), basically have a role in helping athletes in self-control in the form of reducing stress levels, helping to increase attention / focus, increasing self-confidence and even helping to improve athletic motor skills, which in turn will have an impact on athlete's performance in the form of accuracy in several accuracy sports such as golf, archery, shooting and petanque (Mikicin & Kowalczyk, 2015). This is confirmed by research (Gros Lambert, Candau, Grappe, Dugue, & Rouillon, 2014) which showed that with IT and AT interventions, the shooting accuracy of biathlon athletes improved significantly.

However, to improve the ability to shoot accuracy, it is not enough to have mental training in the form of IT or AT, but it is necessary to have support from within an athlete, namely in the form of kinesthetic perception ability which is one of the important elements in increasing accuracy (Hutabarat, Watimena, & Fitranto, 2017; Andi Khemal Akbar, 2018; Kristanto, 2020). The kinesthetic perception ability referred to is a person's ability to control the motion of his body segment and control power during movement (Chaudhuri & Bhardwaj, 2018), so that it will produce an accurate shooting (Davids, Bennett, & Newell, 2006). Based on the above explanation, the purpose of this study is to determine 1) the difference in the effect between mental imagery training and mental autogenic training on shooting accuracy in petanque sports, 2) differences the effect of kinesthetic perception on shooting accuracy in petanque sports, 3) the interaction between mental training and kinesthetic perception on the results of shooting accuracy in petanque sports.

METHODS

The research method used in this study is an experiment with a 2x2 factorial design. The factorial design applied in this study can be seen in **Table 1**.

Table 1. Factorial Research Design 2 x2

Manipulative Variables	Mental Training	
	Imagery (A1)	Autogenic (A2)
Kinesthetic Perception		
High (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2

Information :

A1B1: athletes with high kinesthetic perception are given treatment in the form of imagery training.

A2B1: athletes with high kinesthetic perception are given treatment in the form of autogenic training.

A1B2: athletes with low kinesthetics perception are given treatment in the form of imagery training.

A2B2: athletes with low kinesthetic perception are given treatment in the form of autogenic training.

The population in this study were all petanque athletes in the Greater Bandung area with a total of 60 athletes, while the sampling technique used was simple random sampling, so the number of samples in this study was 40 people, (John Fraenkel; Norman E. Wallen; Hellen, 2012) revealed the minimum standard for the number of samples in the experimental research group of 40 people. Meanwhile, to determine the intervention group using random assignment, the number of each intervention group amounted to 20 people. After being divided into two intervention groups then performed a kinesthetic perception test to divide the intervention group based on high and low perceptual levels, so that the number of samples in each cell group was 10 athletes. Description of the distribution of samples in each treatment group **Table 2**:

Table 2. Composition of Members in Each Intervention Group

Manipulative Variables	Mental Training	
	Imagery (A1)	Autogenic (A2)
Kinesthetic Perception		
High (B1)	10	10
Low (B2)	10	10

The data collection in this study consisted of a kinesthetic perception test and a shooting accuracy test using the FIPJP standard shooting score (Fédération Internationale de Pétanque et Jeu Provençal). The data analysis used was a two-way Analysis of Variance (ANOVA) using SPSS 20, before the normality test analysis was carried out using Kolmogrov-Smirnov and homogeneity test using lavene-statistic.

RESULTS AND DISCUSSION

Table 3.Data Description of General Petanque Shooting Accuracy Results

Kinesthetic Perception (B)	Sources of Statistics	Mental Training (A)	
		Imagery (A1)	Autogenic (A2)
High (B1)	N	10	10
	X	29	22
	S	8,38	3,13
	$\sum X^2$	841	484
	Max	39	26
	Min	17	17
Low (B2)	N	10	10
	X	18,1	21
	S	2,73	1,89
	$\sum X^2$	327,6	441
	Max	21	24
	Min	13	19
$\sum k$	N	20	20
	Xk	23,55	21,5
	S	8,25	2,56
	$\sum kX^2$	1168,6	925
	Max	39	26
	Min	13	17

Table 3 shows the mean value of each intervention group, both the IT and AT intervention groups. In the IT group with a high kinesthetic perception level, an average score of 29 and a standard deviation of 8.38 was obtained, while in the low kinesthetic perception group an average score of 18.1 and a standard deviation of 2.73 was obtained. In contrast to the average value in the group with AT intervention, the high perception was obtained an average score of 22 and a standard deviation of 3.13 and for low kinesthetic perception with an average score of 21 and a standard deviation of 1.89. For the overall average score of the two mental trainings, an average score of 23.35 for the IT group and 21.5 for the AT group was obtained.

Based on the data in **Table 4**, which is obtained from the calculation of the normality test, it can be seen that the Asymp. Sig. The 2-tailed groups in each group were 0.105 and 0.284. The significance value of all data resulting from shooting accuracy on high and low kinesthetic perceptions with imagery and autogenic training methods are all greater than 0.05 (significance > 0.05), meaning that all data are normally distributed.

Based on the data **Table 5** obtained from the calculation of the homogeneity test in table 5, it can be seen that the Asymp. Sig. 2-tailed shows a score of 0.120. The significance value proves that the calculation result is greater than 0.05 ($0.90 > 0.05$), which means that the overall data has the same or homogeneous variance.

Table 6 shows the results of the ANOVA analysis processing which shows that Mental training has an influence on the accuracy of shooting Petanque sports with an fcount of 0.99, $df = 2$ with a significance value of $0.38 > 0.05$ (significant), while the effect of kinesthetic perception is shown in the table above with a score fcount of 1.91 with a sig level of $0.12 > 0.05$, which means that kinesthetic perception has a significant effect on the accuracy of shooting Petanque sports. Even the mental training and kinesthetic perception variables showed an interaction with a score fcount of 18.32 and a significance level of $0.00 < 0.05$.

There is a difference in the effect of mental imagery training (IT) and mental autogenic training (AT) on shooting accuracy in petanque sports.

After testing to see the mental training that most influences the accuracy of shooting petanque, it is known that IT is the training method that most influences the accuracy of shooting petanque. This agrees with (Rama Alestio, 2018; Candra, 2016; Lubis et al., 2020), IT is more influential in accuracy than AT, because mental imagery (IT) is a mental image condition of a sensory, perceptual, affective state. or conscious experience to produce a behavioral picture (Coon, D., 2011), even the process that occurs in IT is a description of the cognitive thinking process (Guarnera et al., 2017). Why is that? Because in the IT process there are four processes in it, such as the process of generation, maintenance, inspection, and transformation (Kosslyn, 1994). Therefore, mental imagery is one of the recommended mental training methods to improve athlete performance, in this case accuracy, considering that in IT each individual performs a

shooting throw motion that mimics a perceptual, motion and emotional experience and is able to produce a motion that is imagined like an actual movement (Lang, 1979), this statement is in line with the neuro-cognitive theory (Murphy, S., Nordin, S. M., & Cumming, 2008), the description of an action / behavior that is carried out will be equivalent to what is imagined or appears from within the brain (Moran, 2004).

There is a significant influence between kinesthetic perception on shooting accuracy in petanque sports.

From the calculation, it is known that athletes with high kinesthetic perception have better accuracy than athletes with low kinesthetic perception, this is in line with (Syahrudin Warta Kusuma Cucu Pradana, n.d.). (Hendrayana, 2015) said that kinesthetic perception itself is a feeling that arises because of the presence of three stimuli from muscle receptors, muscle fascia, tendons, and joints that respond to the parts of the body that control movement to be more accurate. (Fatah, 2014) Kinesthetic perception is one of the functions of organs in the body that have connectivity with body movements as well as actively or passively. Kinesthetic perception allows a person to know how the body should coordinate movements, how the body is in good position at all times, so that he can control the movement well which has feedback in the form of motion automation. (Elbahrawi, 2014, p. 117). Kinesthetic perception is an important part of the ongoing movement skills process (Ngadenan, 2015).

There is an interaction between mental training and kinesthetic perception of shooting accuracy in petanque sports.

The test results show that there is an interaction between mental training and kinesthetic perception of the accuracy of shooting Petanque. The interaction between the two is seen in the difference in effect on the accuracy of Petanque shooting at the two levels of the athlete's kinesthetic perception. That is, mental training, both imagery and autogenic, will be better applied to produce accuracy of shooting petanque by considering the kinesthetic perception abilities possessed by athletes. These mental training tools (imagery, autogenic) will have a significant impact on training if athletes have good basic techniques, because basically mental training must go hand in hand with technical training. The basic technique of the petanque sport, in principle, is not too complicated, because it only consists of 5 parts,

including stance, grip, back swing, front swing and follow through. If someone is familiar with the five parts of the movement, then one can be sure he can do the technique basic throwing on petanque sports. However, because the petanque sport is included in one of the sports of accuracy, it is not enough for an athlete to only perform basic techniques. It takes the development of basic techniques to achieve skills as capital to be able to compete and excel in petanque sports, especially in shooting numbers. The development of skills is influenced by the kinesthetic perception of each individual. (Chaudhuri & Bhardwaj, 2018) states, kinesthetic perception is related to issues related to the senses of movement of various parts of the body, and the forces applied to the body. The more someone is able to feel the motion of their body segments, the easier it will be to control the movements to be carried out. (Jones, 2000)

CONCLUSION

Mental imagery training has a greater effect than mental autogenic training on shooting accuracy in petanque sports.

There is an effect of kinesthetic perception on shooting accuracy in petanque sports.

There is an interaction between mental training and kinesthetic perception of shooting accuracy in petanque sports.

So the conclusion of this study, to obtain high accuracy of shooting Petanque, athletes who have high kinesthetic perception should be selected, supported by programmed imagery training.

REFERENCES

- Agustina, A. T., & Priambodo, A. (2017). Hubungan Antara Tingkat Konsentrasi Terhadap Hasil Ketepatan Shooting Olahraga Petanque Pada Peserta Unesa Petanque Club. *Pendidikan Olahraga Dan Kesehatan*, 5(3), 391–395.
- Andi Khemal Akbar, A. N. (2018). Analisis Persepsi Kinestetik Terhadap Kemampuan Memanah Atlet Panahan Kota Palopo. *Prosiding Seminar Nasional*, 04(1), 206–214.
- Blumenstein, B., Bar-Eli, M., & Tenenbaum, G. (1995). The augmenting role of biofeedback: Effects of autogenic, imagery and music training on physiological indices and athletic performance. *Journal of Sports Sciences*, 13(4), 343–354. <https://doi.org/10.1080/02640419508732248>
- Caliari, P. (2008). Enhancing Forehand Acquisition in TableTennis: The Role of Mental Practice. *Journal of Applied Sport Psychology*, 20(1).
- Campos, A., González, M. A., Dopico, J., & Iglesias, E. (2001). Mental Imagery, Body Image, and Performance in Judo. *Imagination, Cognition and Personality*, 21(1), 47–54. <https://doi.org/10.2190/nw1k-a5cd-064a-gn23>
- Candau, R., Grappe, F., Dugué, B., & Rouillon, J. D. (2003). Effects of autogenic and imagery training on the shooting performance in biathlon. *Research Quarterly for Exercise and Sport*, 74(3), 337–341. <https://doi.org/10.1080/02701367.2003.10609100>
- Candra, A. (2016). Pengaruh Latihan Menendang Menggunakan Imageri Terhadap Akurasi Tendangan Ke Gawang. *Journal Sport Area*, 1(1), 1. [https://doi.org/10.25299/sportarea.2016.vol1\(1\).371](https://doi.org/10.25299/sportarea.2016.vol1(1).371)
- Chaudhuri, S., & Bhardwaj, A. (2018). Kinesthetic Perception : A Machine Learning Approach. <https://doi.org/https://doi.org/10.1007/978-981-10-6692-4>
- Chitra Dhiman, H. S. B. (2010). Imagery On The Trait Anxiety Of The Hockey. 44(Suppl I), 2010.
- Coon, D., & M. J. O. (2011). *Psicologia Generale [General Psychology]*. F. Giusberti, P. E. Ricci Bitti, L. Bonfiglioli, & E. Gambetti (Eds.). Torino; Italy: .: UTET Universitas.
- Davids, K., Bennett, S., & Newell, K. M. (2006). Movement System Variability. Retrieved from https://books.google.co.id/books?id=IAamvxsVIGAC&printsec=frontcover&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- Eko Cahyono, R. (2018). Analisis Backswing Dan Release Shooting Carreau Jarak 7 Meter Olahraga Petanque Pada Atlet Jawa Timur. *Jurnal Prestasi Olahraga*, 1(1), 1–5.
- Elbahrawi, M. (2014). The Effect of Kinesthetic Perception Exercises on Distance and Time Start in Crawl Swimming. *Science, Movemetil Atid Health*, 14(1), 116–121.
- Ernst, E., & Kanji, N. (2000). Autogenic training for stress and anxiety: A systematic review. *Complementary Therapies in Medicine*, 8(2), 106–110. <https://doi.org/10.1054/ctim.2000.0354>
- Fatah, muhammad A. N. (2014). *Journal of Physical Education , Sport , Health and Recreations. Journal of Physical Education, Sport, Health and Recreation*, 4(2), 1613–1620.
- Fontani, G., Migliorini, S., Benocci, R., Facchini, A., Casini, M., & Corradeschi, F. (2007). Effect of mental imagery on the development of skilled motor actions. *Perceptual and Motor Skills*, 105(3 I), 803–826. <https://doi.org/10.2466/PMS.105.3.803-826>
- Gros Lambert, A., Candau, R., Grappe, F., Dugue, B., & Rouillon, J. D. (2014). Effects of Autogenic and Imagery Training on the Shooting Performance in Biathlon. *Research Quarterly for Exercise and Sport*, 74(September), 337–341. <https://doi.org/10.1080/02701367.2003.10609100>
- Guarnera, M., Faraci, P., Commodari, E., & Buccheri, S. L. (2017). Mental imagery and school readi-

- ness. *Psychological Reports*, 120(6), 1058–1077. <https://doi.org/10.1177/0033294117717262>
- Gunaratana H. (2002). *Mindfulness in Plain English*. Somerville: MA: Wisdom Publications.
- Gustopo Bayu Laksana, H. P. & S. B. M. (2017). Perspektif Olahraga Petanque dalam Mendukung Prestasi Olahraga Jawa Tengah. *Physical Education and Sports*, 6(1), 36–43.
- Hendrayana, Y. (2015). The Roles of Kinesthetic Perception, Adaptation, and Agility in Football Skills of. *Journal for Youth, Sports & Health Education*, 1(1), 85–98.
- Hermawan, I. (2012). *Gerak Dasar Permainan Olahraga Petanque*.
- Hutabarat, A. L., Watimena, F. Y., & Fitranto, N. (2017). Hubungan Konsentrasi Dan Persepsi Kinestetik Terhadap Kemampuan Shooting Pada Pemain U-11 Tahun Ragunan Soccer School. *Jurnal Ilmiah Sport Coaching and Education*, 1(2), 78–92. <https://doi.org/10.21009/jsce.01207>
- John Fraenkel; Norman E. Wallen; Hellen. (2012). *How to Design And Evaluate Research in Education*.
- Jones, L. A. (2000). Kinesthetic sensing. *Human and Machine Haptics*, 1–10. Retrieved from citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.133.5356
- Kanji, N. (1997). Autogenic training. *Complementary Therapies in Medicine*, 5(3), 162–167. [https://doi.org/10.1016/S0965-2299\(97\)80060-X](https://doi.org/10.1016/S0965-2299(97)80060-X)
- Katsura, T., & Kojima, K. (1982). Autogenic training and hypnosis. *Japanese Journal of Psychosomatic Medicine*, 22(5), 411–417. https://doi.org/10.15064/jjpm.22.5_411
- Knäuper, B., Roseman, M., Johnson, P. J., & Krantz, L. H. (2009). Using mental imagery to enhance the effectiveness of implementation intentions. *Current Psychology*, 28(3), 181–186. <https://doi.org/10.1007/s12144-009-9055-0>
- Kosslyn, S. M. (1994). *Image and brain: The resolution of imagery debate*. Cambridge: M.I.T. Press.
- Kristanto, N. (2020). Persepsi Kinestetik Terhadap Hasil Pointing Atlet Petanque Jawa Timur. *Prestasi Olahraga*, 3(1), 1–5.
- Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysiology*, 16, 495–512.
- Lubis, M. R., & Permadi, A. G. (2020). Perbedaan Pengaruh Latihan Imagery Dan Tanpa Latihan Imagery Terhadap Peningkatan Kemampuan Shooting Game Atlet Petanque Undikma. *Jurnal Ilmiah Mandala Education*, 6(1), 101–106. <https://doi.org/10.36312/jime.v6i1.1114>
- Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L., & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *Journal of Neuroscience*, 29(42), 13418–13427. <https://doi.org/10.1523/JNEUROSCI.1614-09.2009>
- Mamassis, G., & Doganis, G. (2004). The effects of a mental training program on juniors pre-competitive anxiety, self-confidence, and tennis performance. *Journal of Applied Sport Psychology*, 16(2), 118–137. <https://doi.org/10.1080/10413200490437903>
- Mikicin, M., & Kowalczyk, M. (2015). Audio-Visual and Autogenic Relaxation Alter Amplitude of Alpha EEG Band, Causing Improvements in Mental Work Performance in Athletes. *Applied Psychophysiology Biofeedback*, 40(3), 219–227. <https://doi.org/10.1007/s10484-015-9290-0>
- Moran, A. (2004). *Sport and exercise psychology: A critical introduction* East Sussex. East Sussex, UK: Routledge.
- Murphy, S., Nordin, S. M., & Cumming, J. (2008). Imagery in sport, exercise and dance. In T. Horn (Ed.), *Advances in Sport and Exercise Psychology*, 297–324.
- Ngadenan. (2015). Kontribusi Persepsi Kinestetik dan Kelincahan Terhadap Hasil Tembakan Bola Basket. *Nusantara of Research*, 2(1), 36–48.
- Nurfalah, R. T., Ugelta, S., & Imanudin, I. (2016). Pengaruh Imagery Training terhadap Keterampilan Hasil Shooting Sepak Bola di SSB Java Putra Yudha. *Jurnal Terapan Ilmu Keolahragaan*, 1(1), 40. <https://doi.org/10.17509/jtikor.v1i1.1552>
- Rama Alestio, W. (2018). Pengaruh Circuit Training Dan Imagery Terhadap Akurasi Tendangan Penalti Sepakbola. *Jurnal Patriot*, 263–269.
- Souef. (2015a). *The Winning Trajectory*. Malaysia: Copy Media.
- Souef, G. (2015b). *The Winning Trajectory*. Malaysia: Copy Media.
- Sutrisna, T., Asmawi, M., & Pelana, R. (2018). Model Latihan Keterampilan Shooting Olahraga Petanque Untuk Pemula. *SEGAR*, 7(2), 46–53.
- Syahrudin Warta Kusuma Cucu Pradana. (n.d.). *Kontribusi Tinggi Badan, Panjang Lengan, Keseimbangan, Konsentrasi dan Persepsi Kinestetik Terhadap Ketepatan Shooting Pada Olahraga Petanque*. 1–5.
- Thomas D. Patrick and Dennis W. Hrycaiko, & More, V. (2018). Effects of a Mental Training Package on an Endurance Performance. *Human Kinesthetic Journal*, 12(3), 283–299.
- Weinberg, R., Butt, J., Knight, B., Burke, K. L., & J. (2003). The relationship between the use and effectiveness of imagery: An exploratory investigation. , 15, 26-40. *J Appl Sport Psychol*, 15.
- Zhang Li-Wei, Ma Qi-Wei, T. O. and L. Z. (1992). The Effect of Mental-Imagery Training on Performance Enhancement with 7-10-Year-Old Children. In *The Sport Psychologist*, 6(3).

Table 4. Shooting Accuracy Normality Test Results on IT and AT and Kinesthetic Perception

		Imagery Training	Autogenic Training
N		20	20
Normal	Mean	23.55	21.50
Parameters	Std. Deviation	8.249	2.565
Most Extreme	Absolute	.271	.221
Differences	Positive	.271	.221
	Negative	-.100	-.135
Kolmogorov-Smirnov Z		1.214	.987
Asymp.Sig. (2-tailed)		.105	.284
Test distribution is Normal			

Table 5. Homogeneity Test Results Of Shooting Accuracy Results

Lavene Statistic	df1	df2	Sig.
2.966	2	48	.090

Table 6. Two-Path Anava Results on Shooting Accuracy Between Imagery and Autogenic Training Methods

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	880.133	5	176.027	8.106	.000
Intercept	30195.267	1	30195.267	1.391E3	.000
Training_ Methods	43.033	2	21.517	.991	.038
Kinesthetic_Perception	41.667	1	41.667	1.919	.012
Training Methods * Kinestheti Perception	795.433	2	397.717	18.315	.000
Error	1171.600	54	21.715		
Total	32248.000	60			
Corrected Total	2052.733	59			