

The Impact of harmonic training by simulating the technique of the visual thriller " Fit light " on the Speed of response of the dominant hand and foot of the volleyball Juniors

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Introduction and problem of research:

Relying on the visual system during sports performance is one of the most common uses in any sports activity because vision affects the ability or efficiency of the athlete in performing the requirements of his own sport, and most of the researchers' attempts have tended towards identifying the visual skills necessary for different sports and determining whether those visual skills of athletes differ from non-athletes.

The game of volleyball is one of the games in which the stimulus (ball) is fast moving and the exact direction is unknown, that is, the ball hits very fast so the speed of the motor response of the players must be very high in order to avoid the fall of the ball inside the field, and the player is required to make his senses alert to any stimulus that may occur in front of him and this all depends on the speed of the motor response, whether simple or complex (audio, visual or audiovisual), and the speed of response Kinetic play a prominent role in the game of volleyball, as it is legally required for the player not to keep the ball, which increases the difficulty of performance, the performance is often fast and lightning, so it requires the player to have a high reaction speed, whether in the defensive technique in the follow-up of balls or in the offensive technique when participating in various play vehicles as well as making the decision in the kinetic implementation.

Mahmoud Abdul Mohsen Abdul Rahman (2009) points out that visual dominance is somewhat similar to the lateral dominance of the right or left hand; however, the side of the brain of hand control is not always the same as the brain side of eye control; this is because both sides of the brain control both eyes and each eye controls half of the field of vision and therefore in a different half of both retina, unlike the dominance of the hand or foot. The right hemisphere controls the left side and the left half of the brain controls the right side of the body, so there is no direct similarity between hand control and eye control as a side phenomenon (20:199).

The researchers argue that it is different for visual dominance, visual sovereignty or eye control as an organic or physical component of vision (these components express the eyes and how they collect information from the external medium) and thus the organic components of vision set the possible limits of visual performance in sports because any deficiency in these components may lead to a decrease in the efficiency of visual performance.

Ahmed Mohamed Abdel Khaleq (1981) states that most people have a bias in preferring to use one eye over the other, so that one eye is dominant over the other, and for the dominant hand the right hand is significantly more common than the left, but this is not the case for the eye; there is no predominant rule in the dominance of the eye, and the time of return has been studied as a function of eye domination, and an experiment was conducted that reached four times of return at four levels. Different from the intensity of the stimulus, one of the results of which was that the times of return to the dominant eye were faster than for the non-dominant eye (3:99, 100).

By reviewing the sentence of what was researched and written in this topic, the researcher found that most of the research dealt with the study of visual skills of all kinds in general and when studying visual dominance was limited in most of those studies to research their impact related to the compatibility of the eye - hand and the extent to which performance is affected by visual dominance, and did not address the link to this with the dominant hand or dominant foot; so this was provoked by researchers to do the research of that relationship; so the dimensions of the research problem and its importance to researchers have crystallized Try to identify the effect of visual stimulus training on both the dominant hand and foot response speed in volleyball players.

Hypothesis of the research:

In light of the objective of the research, the researchers assume that harmonic training by simulating the technique of the visual thriller " Fitlight " improves the response of young people in volleyball and increases their rate of attention.

Research Objectives:

The research aims to identify the study of the effect harmonic training by simulating the technique of the visual thriller " Fitlight " for Juniors on :

1. The speed of response to both the dominant hand and foot of the volleyball rookie members of the sample under research.
2. The speed of response to both the non-dominant hand and foot of the volleyball rookie members of the sample under research.

Research Hypotheses:

In light of the objectives of the research, the researchers assume the following:

1. There are statistically significant differences between the averages of the pre- and posterior measurements and the percentage of change in the response speed of both the hand and the non-dominant foot in the volleyball juniors of the sample under research.
2. There are statistically significant differences between the averages of the pre- and posterior measurements and the percentage of change in the response speed of both the dominant hand and foot in the volleyball Juniors of the sample under research.
3. There are statistically significant differences between the mean dimensional measurements and the percentage change of response speed for both the dominant hand and foot, the non-dominant hand and foot, and in favor of the mean dimensional measurements of both the dominant hand and foot in the volleyball Juniors of

Some of the terms in the research:**Harmonic training:**

Physical and skill training performed using the light stimulus as a technical means developed for the purpose of improving the response and attention of players (procedural definition).

Fitlight Technology:

A wireless device with Led optical units distributed in certain measurements that are extinguished according to specific instructions by simply passing the hand or foot over the light sensor to determine the level of performance of the player by the time it takes. (2016) .

Visual Training:

A series of repetitions of eye exercises that improve the relationship between the eyes and the brain by developing vision skills and abilities using graded exercises in difficulty that improve the compatibility and flexibility of the eye muscles with the possibility of controlling those muscles in an attempt to improve basic visual functions and thus athletic performance (33).

Visual domination:

It is sometimes called eye domination or control, and it expresses the tendency to prefer the use of visual stimuli of one eye over the other, and is also known as visual sovereignty, which is the preference to use one eye when looking more than the other eye (8:94).

Peripheral domination of the eye of the hand:

or what is known as peripheral compatibility in the sense that the dominance of the athlete is for the right eye with the right hand or for the left eye with the left hand, that is, the dominant eye is on the same side as the dominant hand (41).

Reverse or cross dominance of the eye of the hand:

in the sense that the dominance of the athlete is for the right eye with the left hand or for the left eye with the right hand (41). It is known as terminal compatibility

Speed of response:

The ability of an individual to meet the kinetics of a particular stimulus in the shortest possible time (10:117).

Previous Studies:

There have been many previous studies in the field of vision training in the sports field whether foreign (55)(45)(37)(26)(57) or Arabic (16)(6)(4)(5)(13)(12)(17)(18)(19)(21)(22)(2), and through looking at the results of those studies, it has been clear to the researcher the effective impact of the use of vision training in the sports field, whether this effect is direct or through the indirect impact of the transmission of the impact of training on the level of performance, as those The results were in line with the general context of the objectives of vision training in the sports field , Similarly, most of what these studies recommended is consistent with the scientific content as well as its practical applicability. As for the nature of the visual training programs, they were as follows:

- The total duration of the program ranged between 4 -10 weeks.
- The number of weekly training times is between 2 – 6 units.
- The training unit time is between 10 – 60 minutes.
- Some of the programs included theoretical aspects and complementary cognitive aspects.

As for the studies on eye domination, it was characterized by historical depth, where Nicholas J. Wade (1998) indicates in his study that the study of the dominant eye was dealt with early, where he mentioned in his study that both Aristotle and Porta 1993 described the test of the dominant eye, and referred to Porta's description of the rivalry dominance and which confirmed that there was a preference for the right eye, and also conveyed that Borelli 1973 determined the intensity of Acuity Concentration with the left eye and these views have all been developed in the context of talking about the prevailing theories of Binocular vision. (48) .

To identify the role of heredity in determining the nature of the pattern of domination, visual dominance was examined in a biologically related sample, and by analyzing the study of families appeared a correlation of moral significance between parents and children, the distribution of the dominance of the left eye in children has increased in connection with the dominance of the left eye in parents, and these results imply that the genetic effect may affect the choice of the preferred side of the eye and for foot dominance it was found that about 62% ($n = 292$) have The dominance of the right, 26% of the dominance of the left, while the rest 12% explained that they do not have a certain preference or that they do not care about it, and for the dominant hand the percentage of the appearance of dominance of the left hand ranged from 54% ($n = 121$), and there is another study on a sample of (283 people with a dominant right hand, 30 people with a dominant left hand) whose results showed that the vast majority 65.81% of the sample members have a dominant right eye, and the visual dominance is not Linked to sex or hand dominance (28).

As for the effect of the pattern of dominance (whether terminal or inverse) on the level of performance did not have a positive impact on the performance of skills in baseball players, whether professional or junior; while the end-hand end-hand dominance had a positive effect on the accuracy of shooting for the triple free throw in the basketball game compared to the players with reverse dominance, while the accuracy of shooting in the shooting rifle learning to shoot was influenced by the pattern of dominance of the eye hand, individuals with reverse dominance did not They learn aiming skills easily compared to individuals with peripheral dominance, the effect of the hand-eye domination pattern seems to vary according to the needs and requirements of each sport; it depends on whether it is a shooting sport or a sport that requires accurate perception and appreciation of distances (35:39,40).

Research Plan and Procedures:**Research Methodology:**

Researchers used the experimental approach to suit the application of research and its procedures.

Research sample:

The research sample was selected by the deliberate method consisting of the originator of the Minya Sports Club under 19 years for the sports season 2020 / 2021 and the number of them 20 players and 5 players were excluded from outside the research sample were used as a sample for the exploratory study, and thus the basic research sample became (15) players and the researchers determined the dominance of both (eye hand foot) of the research sample before starting tribal measurements, and table (1) shows this.

Table (1)

Distribution of the dominance of each of (eye-hand foot) for the research sample =15

	Statement Variables	Right	Left	total
1	dominant eye	11	4	15
2	dominant hand	14	1	15
3	dominant foot	10	5	15

Distribution of the members of the research sample moderately:

The researchers ascertained the extent to which the distribution of the sample members in the variables of height, weight and age (temporal / training), and table (2) shows this.

Table (2)

Statistical Characterization of the Research Sample in Height, Weight and Age
(Temporal / Training) = 15

Variables		measruing unit	SMA	Mediator	standard deviation	skew modulus
Length		cm	174,99	175	5,85	0,049 -
Weight		kg	65,73	64	8,89	1,18
age	Chronological	year	19	18,4	1,45	0,57 -
	Training	year	3,73	4,00	0,79	0,96 -

Table (2) shows that the values of the torsion coefficient of the research sample in height, weight and age (temporal / training) ranged between (1,14, - 0,98) That is, it was confined between (+3, -3) which indicates the moderation of the distribution of female players in these variables.

Research Tools :

To collect data for research, researchers used the following:

- Arab and foreign references.
- forms for collecting and recording data and the results of the tests under research.
- The Restameter PE 3000 to measure height and weight.
- Visual Choice Reaction Time Apparatus Model 63035, and the researchers calibrated the results of this device by comparing its results with the results of another device of the same type and in the same conditions, the comparison gave the same result, indicating the honesty and stability of the results of the device and its suitability for use.

Visual tests under research:

- 1- Dominant eye identification test.
2. Dominant Hand Identification Test.
3. Dominant foot identification test.
4. Visual response speed test.
5. Animated optical accuracy test.
6. Nelson test to measure the return time of the hand (right/left).
7. Nelson test to measure the return time of the foot (right/left).
8. Nelson Test for Selective Motor Response Speed.

- Visual stimulus simulation technique exercises "Fitlight under discussion, annex (1): they included physical and skill exercises

Exploratory study :

The exploratory study was conducted on an exploratory sample of the research community and outside the original sample of the research, which was ten volleyball juniors in the period from Saturday 7/8/2021 to Tuesday 10/8/2021 and this study aimed at:

- to ensure the validity of the tools and devices used.
- Know the time and duration of application of the tests.
- Finding scientific transactions (honesty - stability).

Honesty:

The researchers calculated the honesty of the tests under research by means of terminal comparison on a survey sample from the research community and outside the original sample of the research and the scores of the players were arranged ascending to determine the highest quarters to represent the group of high-level players of (5) players and a percentage (25%), and the lower quarters to represent the group of low-level players of (5) players and by (25%) and the significance of the differences between the two groups in the tests under research was calculated as shown in Table (3).

Significance of differences between the average of the two high-level and low-level groups in the tests under consideration = 10

Tests	Unit of Measurement	Hand or foot used	Upper Quartile		Lawyer Quartile		difference between two averages	T value	Statistical significance
			mean	St.d deviation	mean	St.d deviation			
Optical response speed	time	dominant	0.37	0.044	0.46	0.035	0.09-	5.38	signify
		non-dominant	0.39	0.047	0.48	0.030	0.09-	3.27	signify
Motion Optical Precision	points	dominant	1.5	0.53	0.4	0.52	1.1	8.64	signify
		non-dominant	1.00	0,47	0,1	0,32	0,9	451	signify
Nelson hand reversal time measurement	cm	dominant	0.16	0,017	0,23	0,018	0,07-	5,64	signify
		non-dominant	0.18	0.029	0.26	0.34	0.08-	3.28	signify
Nelson foot reversal time measurement	cm	dominant	0.22	0.017	0.26	0.018	0.04-	6.65	signify
		non-dominant	0.23	0.017	0.28	0.027	0.05-	4.99	signify
Nelson Selective Motor Response Speed	time	--	1.29	0.062	1.78	0.17	0.49-	4.73	signify

(T) value at degree of freedom (18) and significance level (0.05) = 1.734

Table (3) shows that there are statistically significant differences between the group with the highest quadrants, which represents the high level in the tests under research, and the group with the lower quadrants, which represents the low level in the tests under research and in favor of the group with the highest quadrants, which indicates the sincerity of those tests and their ability to distinguish between groups.

Stability:

The researchers applied the tests under research on Saturday, 7/8/2021 and reapplied them on Tuesday 10/8/2021 and with an interval of 3 days on a sample of (10) players from the research community and from outside the basic research sample and under the same conditions and conditions and find the correlation coefficients between the results of the first application and the second application to find the stability of these tests, as shown in Table (4).

Table (4)
Correlation coefficient between the first and second applications for
tests under research = 10

Tests	Unit of Measurement	Hand or foot used	First application		First application		difference between two averages	R value
			mean	Std deviation	mean	Std deviation		
Optical response speed	time	dominant	0.37	0.025	0.37	0.027	0.01	0.749
		non-dominant	0.39	0.024	0.39	0.023	0.02	0.878
Motion Optical Precision	points	dominant	1.9	0.57	1.8	0.55	0.1	0.817
		non-dominant	0.5	0.49	0.7	0.54	0.2-	0.657
Nelson hand reversal time measurement	cm	dominant	0.15	0.015	0.19	0.016	0.00	0.819
		non-dominant	0.26	0.019	0.23	0.016	0.01	0.678
Nelson foot reversal time measurement	cm	dominant	0.29	0.028	0.36	0.015	0.02	0.765
		non-dominant	0.25	0.019	0.28	0.017	0.02	0.899
Nelson Selective Motor Response Speed	time	—	1.32	0.044	1.33	0.044	0.01	0.944

The value of (R) tabular at the degree of freedom (8) and the level of significance (0.05) = 0.632

Table (4) shows that the correlation coefficients between the first and second applications of the tests under consideration have been limited to (0.655 – 0.941) which are statistically significant correlation coefficients, indicating the stability of these tests.

Research implement steps

Pre measurements:

The researchers performed the pre-measurement on the research sample on Wednesday and Thursday 11,12/8/2021 ,and the researchers took into account the application of tests in a unified manner

Steps for designing and implementing a visual stimulus training program:

1-The researchers conducted a reference survey of specialized scientific references and previous studies in the field of eye training and vision improvement; in order to determine the nature and form of visual exercises of the dominant eye.

2-based on the above, visual exercises were designed and the visual skills they contained, and researchers have relied when designing visual exercises on the following foundations:

- Observe the objective of the visual training.
- Visual content is suitable for technical capabilities and capabilities.
- Observance of the principles of eye training: (Breathe breathing, blinking, smiling Smile Achieve pleasure Have Fun, Persistence and seriousness, trust and belief in the effectiveness of Believe training).
- Providing technical capabilities and designing visual tools and devices.
- Flexibility of implementation and application commensurate with the current situation of the research sample technically and visually.
- The availability of an element of excitement and seriousness for the proposed exercises.
- Take into account the similarity of the form of performance of the proposed exercises with the nature of the performance of the skills of the game of volleyball.
- Use of auxiliary muscles in eye movements.
- Guided by the results of the exploratory study in determining the variables of the training load.

3-The researchers set the time period for the application of the proposed visual exercises to eight weeks starting from Sunday 15/8/2021 and ending on Thursday 7/10/2021.

4- The researchers identified the training modules in three units (Sunday, Tuesday and Thursday) of each week.

5-The visual training program included a number of (81) training, which is described in Annex (1) and table (5) shows the components of the visual training program for the dominant eye.

Post Measurements:

on The researchers performed the telemetry of the research sample Saturday and Sunday 9, 10/10/2021 and in the same method that was followed in the pre-measurement and under the same terms and conditions.

Statistical treatments used in research:

The researchers prepared, scheduled and analyzed the data statistically with the extraction and interpretation of the results using the Spss program for each of the following statistical methods: arithmetic average, standard deviation, torsion coefficient, correlation coefficient, "T" test, percentage of improvement (change), at the level of significance (0.05).

View and discuss results:

Table (6)
Significance of the differences between the averages of the pre- and posterior measurements in the tests under consideration = 15

Tests	Unit of Measurement	Hand or foot used	Pre measurement		Post Measurement		average differences	Std of differences	T value	Statistical significance	Percentage Change
			Mean	Std deviation	Mean	Std deviation					
Optical response speed	time	dominant	0.49	0.53	0.34	0.044	0.12	0.05	3.96	signify	34.31
		non-dominant	0.46	0.039	0.41	0.046	0.09	0.036	4.15	signify	14.29
Motion Optical Precision	points	dominant	0.44	0.54	1.7	0.43	1.7-	0.53	2.09	signify	77.80
		non-dominant	0.39	0.46	1.19	0.34	0.8 -	0.59	3.78	signify	70.83
Nelson hand reversal time measurement	cm	dominant	0.17	0.015	0.18	0.022	0.069	0.014	4.88	signify	46.35
		non-dominant	0.27	0.026	0.21	0.035	0.063	0.044	3.86	signify	31.64
Nelson foot reversal time measurement	cm	dominant	0.26	0.016	0.19	0.018	0.074	0.029	3.29	signify	41.63
		non-dominant	0.26	0.025	0.22	0.025	0.049	0.028	2.07	signify	16.64
Nelson Motor Response Speed	time	—	1.77	0.19	1.44	0.15	0.39	0.19	3.39	signify	25.23

Tabular value (v) at degree of freedom (14) and significance level (0.05) = 1.761

Table(6) shows that there are statistically significant differences between the averages of the pre- and posterior measurements in all the tests under research and the percentage of change in favor of the mean dimensional measurement whether for the dominant hand or foot, or for the non-dominant hand or foot, and the researchers believe that this is considered logical and normal; as these results are for the same players to whom the proposed program of visual stimulus training was applied, but the difference is the hand or foot used in the implementation and performance of tests whether dominant Or non-dominant.

The tests were also carried out under conditions of double eyesight, and this improvement is explained by what Chaurasia BD, Mathur BB (1976) pointed out that there must be a connection between the two hemispheres of the brain in relation to the individual functions of the body (27).

Mohamed Abdel Aziz Salama (1993) also points out that the rates of precision shooting in basketball increase under conditions of double vision with both eyes and also increase the rates of motor balance in players under conditions of double vision of three dimensions (16: 15).

Brian Ariel (2006) argues that vision with both eyes arises from the high superiority of monocy vision, and the speed of the foot eye and the speed of response by moving the foot to the visual stimulus in any sport that includes a high degree of mobility needs a good eye foot speed and The lack of this ability is evident when the player does not move fast enough to reach the ball, and the speed of perception and visual discrimination is integrated with the anticipation speed If the visual signals are read early enough, they allow the player time to be in the right place at the right time (27). The results of the current study are consistent with previous studies that were available to the researcher, especially those of experimental nature, whether Arab(2)(4)(5)(6)(12)(13)(17)(18)(19)(20)(21)(22)orforeign(26)(32)(37)(45)(55) (57),which concluded in its results that there is a semi-agreement on the effectiveness of training for visual skills, and that there are improvements and gains whose impact is transferred to performance as a result of the improvement of visual and physical abilities.

Table (7)

Significance of Differences between the Averages of the Dimensional Measurements of the Non-Dominant Hand and Foot and the Dominant Hand and Foot in the tests under consideration = 15

Tests	Unit of Measurement	Non-dominant hand and foot		dominant hand and foot		average differences	Std of differences	T value	significance	Differences in improvement rates
		Mean	Std deviation	Mean	Std deviation					
Optical response speed	time	0.44	0.049	0.39	0.048	0.064	0.047	6.82	signify	20.00
Motion Optical Precision	points	0.15	0.037	0.16	0.029	0.066	0.049	4.32	signify	6.91
Nelson hand reversal time measurement	cm	0.44	0.049	0.39	0.048	0.064	0.047	6.82	signify	14.52
Nelson foot reversal time measurement	cm	0.15	0.037	0.16	0.029	0.066	0.049	4.32	signify	24.58

Tabular value (v) at degree of freedom (14) and significance level (0.05) = 1.761

Table(7) shows that there are statistically significant differences between the averages of the two dimensional measurements of the hand and the non-dominant foot and the dominant hand and foot in all the tests under research and the percentage of change in favor of the mean dimensional measurement of the dominant hand and foot, and the researchers attribute this to the success of the proposed visual stimulus training program for the dominant eye and its positive impact on the dominant hand and foot, the program has been applied using the dominant eye only with the closure of the non-dominant eye and the implementation of tests has been done using both eyes Therefore, the results showed an improvement in the speed of response of both the hand and the foot (dominant/non-dominant), but the differences in the rates of change came in favor of the dominant foot and hand

Referring to the pattern of dominance in the research sample in table (1) where the dominance of the two parties (13 players of right peripheral dominance and two players of left peripheral domination) it is clear to us the reason for the positive impact of dominance on performance and the benefit that occurred in the members of the research sample from the proposed visual training program for the dominant eye, which improved the compatibility relationship between the hand eye or the foot eye. The significance of this seems to be according to Jannie Ferreira, Odette Truter (2004) that the dominant eye's processing of information is 17–21 milliseconds faster than the non-dominant eye (41).

These findings are consistent with the conclusion of Ashton W. Pomreh (2008) that the peripheral dominance of the eye-hand had a positive effect on the accuracy of the three-pointer free throw in the basketball game compared to the players with reverse dominance (23). As well as the results of Jones, Class, Hester, Herris (1996) (1996) Jones LF, Classe JG, Hester M, Harris K that the accuracy of aiming in a shooting rifle was influenced by the pattern of hand eye domination, individuals with reverse dominance did not learn aiming skills easily compared to individuals with peripheral dominance (42). The results of the current study are consistent with previous studies made available to the researcher (35)(36)(41)(44)(49)(53), which concluded in their results the importance of visual dominance and its role in increasing the effectiveness of performance.

Conclusions:

- 1- The proposed visual stimulus training program for the dominant eye has a positive effect on the speed of response of the hand and foot (dominant/non-dominant).
- 2- There is an improvement in the speed of response of the non-dominant hand and foot in volleyball players of the research sample, where the percentage ranged between (14.28% "Visual response speed": 70.79% "Moving visual accuracy").
- 3- There is an improvement in the speed of response of the dominant hand and foot in volleyball players of the research sample, where the percentage ranged between (34.28% "Visual response speed": 77.77% "Moving visual accuracy").
- 4- There are differences in the percentage improvement rates between the speed of response of the hand and the non-dominant foot and the speed of response of the dominant hand and foot in the volleyball players of the research sample, where the differences in the percentage of improvement ranged between (6.98% "Moving visual accuracy": 24.52% "Nelson to measure the return time of the foot") and in favor of the dominant hand and foot.

Recommendations:

- 1- The need to pay attention to activating the role of visual stimulus training in the sports field in general and volleyball in particular, as visual skills can be trained and therefore can be improved.
- 2- The need to pay attention to the exercises of the visual stimulus, whether for the dominant or non-dominant eye in light of the nature and pattern of dominance (peripheral and reverse) because of their impact on performance.
- 3- Attention to the work and design of tests that measure the qualitative visual skills of the game of volleyball so that it can be improved and developed.
- 4- Apply this program to the basic skills of the game of volleyball and know its impact during the competition.

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The impact of harmonic training by simulating the technique of the visual thriller " Fit light " on the Speed of response of the dominant hand and foot of the volleyball Juniors

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This research aims to identify the effect of visual stimulus training on both the speed of response of the dominant hand and foot and the non-dominant hand and foot in volleyball players. The researchers used the experimental approach and the deliberate research sample consisted of one group of (15) players from the juniors of Minya Sports Club under 17 years, and the proposed visual stimulus training program was applied for eight weeks by three training units per week, and the results showed that the proposed training program has a positive effect on the speed of response of the hand and foot (dominant / non-dominant), and that the differences between the percentages of improvement of the speed of response of the hand and foot (dominant / non-dominant) were in favor of the hand and foot Dominant.

One of the most important recommendations is the need to pay attention to activating the role of visual stimulus training in the sports field in general and volleyball in particular and the need to pay attention to visual training, whether for the dominant or non-dominant eye in light of the nature and pattern of dominance (peripheral and reverse) because of their impact on performance.

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