Relation Between Personality and Success in Sports

IB Sports, Exercise, and Health Sciences SL

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Background

Playing a sport takes determination, motivation, and physical commitments. People usually choose their sport on what they think would be fun. Team sports require close cooperation with teammates, and the willingness to be a team player. Individual sports require self-motivation, it is you, and the game. So, when an athlete chooses a sport, do their fundamental personality traits play a role in their success?

Sports psychology is a major part of sports in general. A person needs to be of a fit mind and body to exceed in their game. If a person is more suited to play a specific sport, they should be able to excel in the sport easier than others. This is the main point that this investigation delves into.

It seems that it would be reasonable if you would assume that a person who is more introverted would play a sport where no communication between other people would be necessary. These introverted people would not need the energy of their teammates to keep their own energy up, whereas a person who is more extraverted would be deprived of that energy while playing alone. On the other hand, extraverted people would be likely to thrive in a high energy game, full of their teammates cheering them on and motivating them to keep playing at their highest level.

So, is the theory that people who thrive off of others' energy play team sports, and the people who only need themselves play individual sports true? Or does it not matter to the athlete? This leads to the research question of: 'Is there a connection between an athlete's success in their sport and their personality?'

I am extremely interested in this topic. Psychology is a very interesting subject area, and I was wondering if I could apply the theory of personality to sport. This can be applied to the real world by seeing if by knowing your own personality, which sport is best suited for you. When choosing a sport, then your coach could see your personality traits and help you become a better athlete.

Personalities cannot be quantitated, so they cannot be measured either. This makes research into this topic tough. Not only because there are no numerical values that make up a person, but because there are a million ways to fit a person into a personality. So, to combat this problem, an independent variable can be brought in, the athlete's success in the sport, on a scale of 1-10 (as seen in appendix I)

A reliable way to find out a person's personality traits is the 16personalities Myers-Briggs test. This test 'incorporates the latest advances in psychometric research, combining time-tested concepts with robust and highly accurate testing techniques.', as said by the 16 personalities website.

This test has the ability to record if a person is extraverted or introverted. This is the main point of the test that this investigation will focus on.

This questionnaire has been used cross-culturally, and is used by many psychologists. So, it leads to the conclusion that it is reliable and valid in an investigation into personality traits.

Research question

Does being extroverted or introverted have any effect on success in a team vs. individual sport?

Aim

The purpose of this investigation is to discover if there's a correlation between a person's personality, and success in the sport the individual plays. The experimentation will be mainly focusing on if a person's personality is introverted or extraverted. This will be done through a survey, and the completion of a questionnaire that determines the individuals' personality type. This survey will be taken by high school athletes. The data collected from this survey will be analyzed statistically, to determine if extraversion or introversion has an impact on the athlete's success in a sport.

Variables

Independent Variable:

If an athlete chooses to play an individual or team sport, and their success in that sport

Dependant Variable:

Personality type given by 16 personalities test, specifically if their result begins in a E- (extraverted result)or an I- (introverted result)

Controlled Variables		
Variable:	How is it controlled?	Why is it controlled?
Survey	Every person takes the same survey	This is so results can be as accurate as possible, as to not give different people a different survey so they may take it differently than others.
Questionnaire	Every person takes the same personality questionnaire	This is controlled so the results are all the same, and so these results can be reliably and accurately compared
Athletes	All people who contribute to the survey are highschool athletes	This is so the investigation can be applied to highschool students
Sports are random	No certain sports were chosen to take the survey, it was sent to all athletes of different grades.	This is to give clarity and so the investigation is far reaching, and the results can be applied to all high school

		athletes (shown in appendix III)

Confounding Variables		
Variable:	Why is it considered?	How can it affect the results?
Age Variation	People of different ages, even though they are all in highschool, would know themselves very differently.	The athlete can not know the answer to one of the questions on the personality questionnaire, which would skew results.
Emotions During Survey	Being sad, happy, or angry during the test can change a person's answers to the questions	The non-neutrality of their emotions can skew the results, giving non-accurate results on the investigation.
Motivation	Motivation to finish the survey truthfully can change the person's results.	The change of the results can affect the outcome of the investigation
Concentration	A person can be concentrating on many	Not answering with thought or accidentally not

	different things, given that the survey was not given in a controlled environment	answering a question correctly can skew the results of the test

Hypothesis

The mean success for extraverts who play individual sports would be less than the mean success for extraverts who play team sports.

The mean success for introverts who play individual sports would be more than the success for introverts who play team sports.

Team athletes need to be able to communicate with their teammates, so extraversion should help make them better at their sport. This extraversion, when surrounded by others, would enable the person to thrive around their teammates so they can perform at a high level during competition. Individual athletes only need to communicate with themselves during performance, so they would be expected to not need the energy given by others to perform at a high level.

Null Hypothesis

The mean of the success for extraverts who play individual sports would equal the mean success for extraverts who play team sports.

The mean success for introverts who play individual sports would be equal to the mean success for introverts who play team sports.

Materials

- ❖ Computer with internet access
- ❖ Google survey (appendix V)
- ❖ 16 Personalities test (appendix VI)
- ❖ Participants

Procedure

1. A link to the google survey was sent out via social media, and was written on teacher's boards in the school
2. Athletes that fill out the survey become participants in the investigation
    a. All people who take the survey are anonymous, there is no way to determine a person based on the survey
3. Results are recorded into the survey and is viewable by the participants after the investigation is completed

Method

1. Share link to survey on social medias, send out to teachers, and write on boards to get as many participants as possible
2. Try to get survey out to as many athletes as possible

3. Collect results after a considerable amount of participants have filled out the survey (40 < participants)
    a. Recommended 3-week time frame for survey to be filled out by athletes
4. Take results and make a table of Raw data of success in individual and team sport and introversion and extraversion (see appendix II for formatting)
5. Take averages of all the sections
    a. Extraverts who play team sports, extraverts who play individual sports, introverts who play team sports, and introverts who play individual sports
6. Compare and contrast results

Safety, Ethics and Environmental impact

- ❖ No health concerns are prevalent because the participants are only asked to anonymously fill out a survey
- ❖ All participants remain anonymous, so the identity of all the participants are protected
- ❖ Participants willingly fill out the survey, it is posted and they only take it if they wish to.
- ❖ All surveys were taken online, so there was no paper used in the process of the investigation. This makes environmental impact as little as possible

Analysis

Raw Data

Table 1: *Raw data of success in individual and team sport and personality type*

	Individual sport	Team Sport
Extraverted personality	4, 4, 7, 2, 4, 2, 4, 4, 4, 4, 4, 8, 6, 3, 10, 10	4, 4, 2, 4, 4, 7
Introverted personality	4, 5, 5, 5, 10, 8, 10, 6, 6, 4, 4, 7, 9, 4	4, 6, 2, 7, 7, 9, 9

Table 2: *Types of athletes that completed the questionnaire*

Individual athletes	30 (14 introverts, 16 extraverts)	Swim/Dive	4
		Running	4
		Weights	2
		Taekwondo	2
		Walking	4
		Dance	2
		Golf	2
		Cycling	1
		Rock Climbing	1
		Tennis	5
		Equestrian	2
		Wrestling	2
Team Athletes	13 (7 introverts, 6	Football	2
		Baseball	1

	extraverts)		
		Softball	2
		Soccer	2
		Lacrosse	1
		Basketball	2
		Volleyball	1
		Hockey	1

Data Processing

Table 1: *Mean Success of athletes in individual sports and team sports, based on extraversion or introversion*

	Individual sport	Team Sport
Extraverted Result	(4 + 4 + 7 + 2 + 4 + 2 + 4 + 4 + 4 + 4 + 4 + 8 + 6 + 3 + 10 +10) ÷ 16 = **5.00**	(4 + 4 + 2 + 4 + 4 + 7) ÷ 6 = **4.16**
Introverted Result	4 + 5 + 5 + 5 + 10 + 8 + 10 + 6 + 6 + 4 + 4 + 7 + 9 + 4) ÷ 15 = **6.21**	(4 + 6 + 2 + 7 + 7 + 9 + 9) ÷ 7 = **6.29**

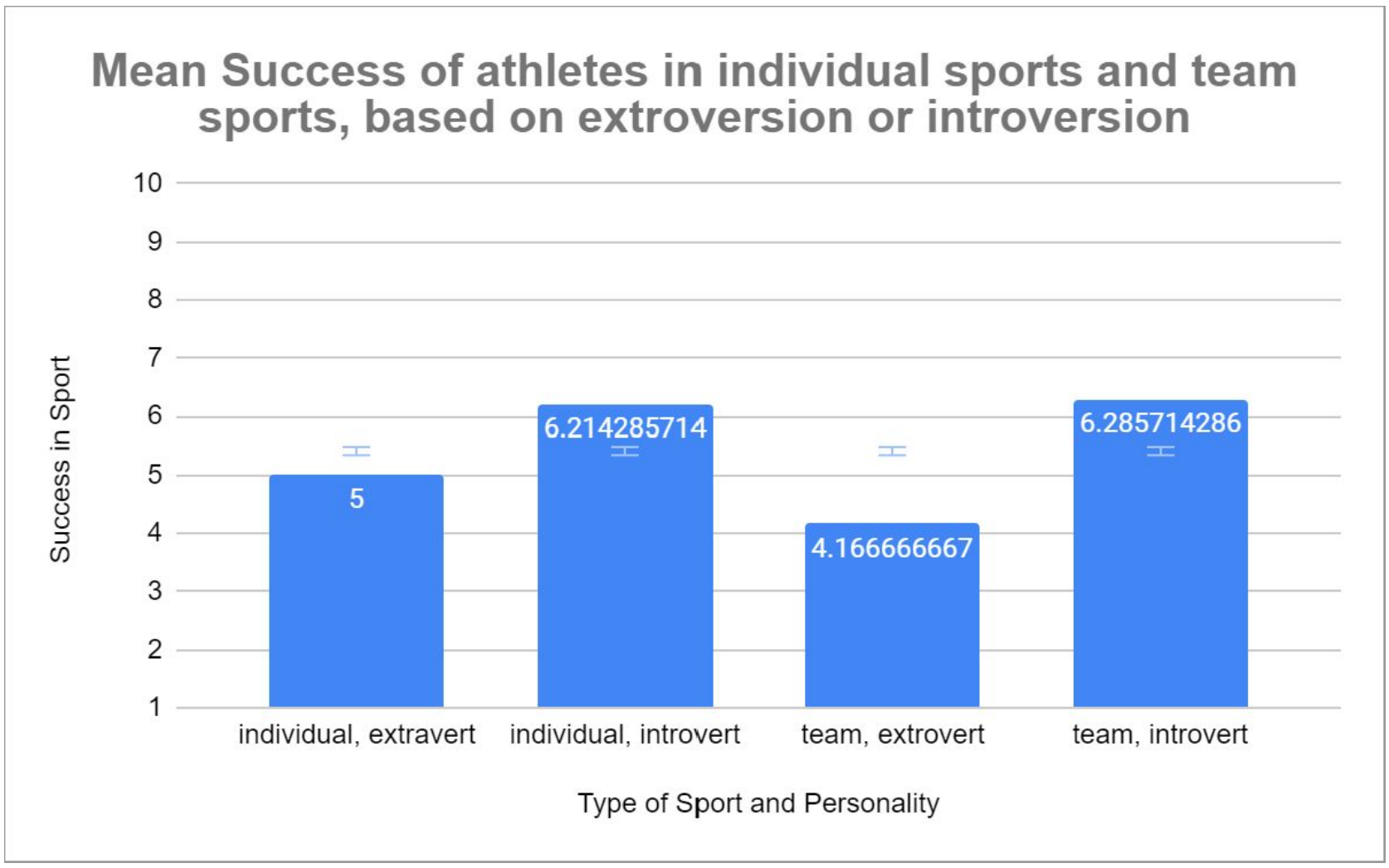
Table 2: *Calculations of standard deviations and error bars*

	Mean	Standard Deviation		
Individual, Extravert	5	5 - 5.42 = -0.42	(-0.42)^2 = 0.18	
Individual, Introvert	6.21	6.21 - 5.42 = 0.79	(0.79)^2 = 0.62	
Team, Extrovert	4.17	4.17 - 5.42 = -1.25	(-1.25)^2 = 1.56	

Team, Introvert	6.29	6.29 - 5.42 = 0.87 (0.87)^2 = 0.76	
		+_____ 3.04 3.04 ÷ 4=. 76 76^½ = **.87**	Error Bars .87 ÷ 4 = ±0.07

Graph 1: *Mean Success of athletes in individual sports and team sports, based on extraversion or introversion*

(error bars were not able to be moved to proper places, error bars of ±0.07)



Data Analysis

For each type of sport and personality, the success in sport differed. The highest average success was with introverted people who play a team sport. They averaged a score of

6.28, which is a score of competing at a varsity level. A very close result came with the introverts who play individual sports, also averaging at playing at a varsity level. The lowest average success was in extroverted people that played team sports, with an average of 4.16, which means they compete at a JV level. Extraverts who played individual sports averaged at a 5, which means they think they could play at a varsity level.

When comparing athletes who play team sports that are introverted vs. extraverted to determine statistical significance, the results are recorded below.

Results

$Mean_a$—$Mean_b$	t	df	P		
2.119	+1.75	11		one-tailed	0.0539615
				two-tailed	0.107923

For independent samples, these results pertain to the "usual" t-test, which assumes that the two samples have equal variances.

F-Test for the Significance of the Difference between the Variances of the Two Samples

df_1	df_2	F	P
6	5	2.63	0.153964

[Applicable only to independent samples.]
P>.05 indicates no significant difference detected between the variances of the two samples.

The one-tailed P-value that was given by the t-test that is 0.05, would mean that we are looking at a 5% chance that the result was due to random chance. This means that this data is statistically significant, and we can reject the null hypothesis in favor of the alternate.

When comparing athletes who play individual sports that are introverted vs. extraverted to determine statistical significance, the results are recorded below.

Results

$Mean_a$—$Mean_b$	t	df	P	one-tailed	0.0862485
-1.2143	-1.4	28		two-tailed	0.172497

For independent samples, these results pertain to the "usual" t-test, which assumes that the two samples have equal variances.

F-Test for the Significance of the Difference between the Variances of the Two Samples

df_1	df_2	F	P
15	13	1.28	0.330788

[Applicable only to independent samples.]
P>.05 indicates no significant difference detected between the variances of the two samples.

The one-tailed p-value that was given by the test was 0.08, so we are looking at an 8% chance that the result was due to random chance. This is on the border since we usually want the p-value to be under 0.1, 0.05, or even 0.01. In this instance, we can reject the null hypothesis in favor of the alternate.

It almost seems from the data that we could also conclude that introverts are generally better at sports than extraverts, from looking at the bar graph. Introverts, in team and individual sports, ended up with an average of a 6 in success. While extroverts scored a 4 and a 5 in sports success. This is a surprising result because introverts are generally seen as people who keep to themselves, not being good at communication. Where in a team sport, this communication is essential to the success of an athlete.

Conclusion

The investigation to determine if extraverts who play individual sports would be less successful than extraverts who play team sports and if introverts who play individual sports would be more successful than extraverts who play team sports was carried out by a survey and questionnaire. This survey would ask the athlete to rate their success in their sport on a scale of 1-10, then the athlete would fill out a questionnaire that would tell if that player was extraverted or introverted, which would be collected by a survey website (appendix V). A wide range of high school athletes from random sports, different genders, ages, and more filled out the form. These athletes were analyzed to see if there was any correlation between the success they had in their team or individual sport, and if it was due to the fact that they were introverted and extroverted.

Based on the results, we can reject the null hypothesis. This is because the mean success for extraverts who play individual sports was not equal to the mean success for extraverts who play team sports, and the mean success for introverts who play individual sports was not equal to the success for introverts who play team sports.

The significant success of introverts who play team sports was surprising, considering that this goes directly against the hypothesis. This is also surprising because that group scored the highest out of all of the groups. Another surprising fact about the data was that The extroverts who play a team sport scored the lowest in success, which again goes directly against the hypothesis.

In conclusion, introverts who play team sports have the highest average achievement out of all the groups, coming in at a 6, which is playing on a varsity team. Introverts who

play an individual sport have the second-highest average success, coming in at a 6 as well. Both groups of introverted athletes seem to do the best when compared to their extraverted counterparts. Extraverts who play individual sports got in third place, averaging at a success score of 5, which is thinking you could play at a varsity level. Finally, the lowest of all were extroverts who play team sports. These athletes came in at a 4, which is averaging around a JV athlete.

This investigation supported the hypothesis that success for introverts who play individual sports would be more than the success for introverts who play team sports. The investigation also did not support the hypothesis that success in extraverts who play individual sports would be less than the mean success for extraverts who play team sports.

Evaluation

In this experiment, the results that were gathered are fairly reliable. All athletes took the same survey and questionnaire, which makes the data more reliable. The order of the questions was not changed, which does not make the survey different for different athletes. There were 43 participants from a random pool of highschool students (Appendix III). The large participant sample made the data collected more showing of the high school athletic population. The widespreadness of the sports that the athletes play also gives a better picture of the general high school athletic population.

Some factors that could make this data unreliable was the fact that the environment was not controlled for the participants and the fact that most high school athletes do not specify in a singular sport. The environment was not controlled because of the need for a

bigger subject pool, and most people would not participate if it were not convenient for them to. So, if this investigation were to be done again, it would be wise to implement a controlled environment for the athletes to complete the survey and questionnaire. Holding the survey on the same day in the same place that could be overviewed by the experimenter would lessen the chance of environmental changes, which could alter the results of a participant's answers to the survey.

A limitation of this investigation that could make the results invalid was that most of the survey and questionnaire were based on self-assessment. This means that the participants could have answered incorrectly to the truth. This also gives rise to subjectivity, which is something existing in someone's mind rather than the real world. This means that someone could think something is true about themselves, but in reality, it is not. This gives the experiment unfactual data that can skew results. A way to combat this would be for peer reviews to take place of the surveys and questionnaires, specifically by coaches or other athletes that the participant plays with. Peer-reviews would not be convenient for the participant, however, which would make it less likely for them to become a participant in the study. This would make the investigation more reliable and valid, however. This would implement validity to the answers of the athlete, and it could bring in a bigger subject pool. This would also increase the reliability of the conclusions of the investigation.

Making the participant group as large as possible would be a good implementation for this experiment. Since it is self-assessed, the greater amount of people participating would lessen the impact of errors made during the surveys by the participants. The larger the group, the more accurate and valid the data. Finding as many participants that would be

willing to do the peer reviews and the survey would be the best-case scenario for re-experimentation.

Works Cited

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Appendix

Appendix I

Section of Questionnaire- *Rating success on a scale of 1-10*

10 = You have represented your country

9 = You think you could represent your country

8 = You have competed at state level

7 = You think you could compete at the state level

6 = You have competed at varsity level

5 = You think you could compete at varsity level

4 = You have competed at an organized (JV, Club, etc.) level

3 = You think you could compete at an organized level

2 = Your sport is only social (occasional game with friends at the park)

1 = You don't play any sport

Appendix II

Table A: *Raw data of success in individual and team sport and personality type*

	Individual sport	Team Sport
Extraverted Result	4, 4, 7, 2, 4, 2, 4, 4, 4, 4, 4, 8, 6, 3, 10, 10	4, 4, 2, 4, 4, 7
Introverted Result	4, 5, 5, 5, 10, 8, 10, 6, 6, 4, 4, 7, 9, 4	4, 6, 2, 7, 7, 9, 9

Appendix III

Table B: *Types of athletes that completed the questionnaire*

Individual athletes	30	Swim/Dive	4
		Running	4
		Weights	2
		Taekwondo	2
		Walking	4
		Dance	2
		Golf	2
		Cycling	1
		Rock Climbing	1
		Tennis	5
		Equestrian	2
		Wrestling	2
Team Athletes	13	Football	2
		Baseball	1
		Softball	2
		Soccer	2
		Lacrosse	1
		Basketball	2
		Volleyball	1
		Hockey	1

Appendix IV

Image A: *comparing athletes who play team sports that are introverted vs. extraverted*

Results

$Mean_a$—$Mean_b$	t	df	P		
				one-tailed	0.0539615
2.119	+1.75	11		two-tailed	0.107923

For independent samples, these results pertain to the "usual" t-test, which assumes that the two samples have equal variances.

F-Test for the Significance of the Difference between the Variances of the Two Samples

df_1	df_2	F	P
6	5	2.63	0.153964

[Applicable only to independent samples.]
P>.05 indicates no significant difference detected between the variances of the two samples.

Image B: *comparing athletes who play individual sports that are introverted*

Results

$Mean_a$—$Mean_b$	t	df	P		
				one-tailed	0.0862485
-1.2143	-1.4	28		two-tailed	0.172497

For independent samples, these results pertain to the "usual" t-test, which assumes that the two samples have equal variances.

F-Test for the Significance of the Difference between the Variances of the Two Samples

df_1	df_2	F	P
15	13	1.28	0.330788

[Applicable only to independent samples.]
P>.05 indicates no significant difference detected between the variances of the two samples.

Results are given by vassarstats.net, a website used for statistical computation.

Appendix V

Google Survey for Participants

https://docs.google.com/forms/d/1MFlEp7PvrqmbK_U1Jcwv-uAwHID0dA2QLcVpA5Ptwd8/prefill

Appendix VI

Website used for personality analysis

16personalities.com