Journal of Research High School

Vol. 2025 (9) 728 – 736
ISSN 2688-3651 [online]

Exploring the Relationship between Personality Traits and Learning Success in High School Fencing

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Received July 15, 2024; Revised April 11, 2025; Accepted June 4, 2025

Abstract

This study investigated the relationship between personality traits and learning success in high school fencing. By focusing on the traits of extraversion/introversion and neuroticism/stability, the research aimed to understand how these factors influence the acquisition of fencing skills. Understanding the influence of personality traits on athletic performance is essential to developing effective training approaches. The Eysenck Personality Inventory (EPI) was administered to seven high school fencing students, and their performance in a standardized fencing lesson was evaluated. The results indicate a weak positive correlation between higher levels of extraversion and better fencing performance, suggesting that extraverted individuals may be more adept at learning fencing techniques. Conversely, the correlation between neuroticism/stability and learning success was less pronounced, challenging the notion that emotional stability significantly impacts skill acquisition. The findings underscore the importance of considering individual personality traits in the context of fencing instruction and suggest that factors such as resilience and effective coping mechanisms may play a crucial role in overcoming learning challenges. The study highlighted the need for further research with larger and more diverse samples to enhance the generalizability of the results and explore the long-term retention of fencing skills in relation to personality traits.

Keywords: Fencing, Eysenck Personality Inventory (EPI), Introversion, Neuroticism, Extraversion, Stability, Skill acquisition

1. Introduction

Fencing is an intriguing activity that blends agility, strategy, and accuracy in head-to-head matches. It demands a special mix of mental and physical strength. Fencing is like an intricate dance of swords and strategic maneuvers that transports individuals to a realm where choices made in the midst of combat can determine success or failure (Evangelista, 2024). As for the influence of personal characteristics, particularly personality traits, on the acquisition of fencing skills, there is a noticeable gap in research despite the sport's long history and diverse appeal. This overlooked aspect of the fencing community is what spurred me to investigate the complex relationship between personality types and fencing learning success. In sports psychology, personality traits have been recognized as influential factors in athletic performance and learning. For instance, extraversion has been associated with improved performance in high-interaction sports due to traits like assertiveness and responsiveness to feedback, while neuroticism has often correlated with decreased performance under stress due to emotional instability (Allen, Greenlees, & Jones, 2013).

A trend between success in learning and personality can be seen in the study, “A Comparative Study to Learn Compound Attack Based on (A-B) Personality Types for the 3rd Stage Females Students in Fencing Lesson,” which highlights how different personality types learn a compound attack (Mohamed, 2016). However, this prior study does not investigate this topic using subjects who are in high school. To add, they do not utilize the Eysenck Personality

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ISSN 2688-3651 [online]

Inventory (EPI)—a test that shows personality types of extraversion, introversion, and neuroticism (Eysenck, Nias, & Cox, 1982). The main objective of this research is to provide insightful information that substantially advances our knowledge of how individual differences influence learning results in the particular setting of fencing. This investigation is led by the research question: "How do specific personality traits affect a person's learning success with high school fencing?" The investigation's main goal is to comprehend the intricate connections between high school students' personality traits and their learning of fencing skills. Based on this, my hypothesis proposes that the ability of high school students to learn fencing is influenced by higher scores of extraversion and stability.

2. Literature Review

2.1 Choice of Sport from Personality Type

The relationship between personality traits and sports preferences is an established subject in sports psychology, and fencing—which is categorized as an individual sport—offers a unique setting for investigation (Evangelista, 2024). The study by Gaderi and Ghasemi explored how emotional intelligence and personal traits, particularly introversion and extraversion, influence teenage girls' decisions to play individual or team sports. The Schutte Emotional Intelligence Scale and Eysenck Personality Questionnaire was used in the study on a sample group of 100 teenage female athletes, equally divided between individual (50 athletes) and team sports (50 athletes). The research sheds light on the complex relationship between teenage sports choices, emotional intelligence, and personality traits and offers new insight into this unique picture in the context of adolescent female athletes. It also suggests a possible connection between extraversion and a preference for team sports (Ghaderi & Ghasemi, 2012).

2.2 Relation between Personality and Success in Various Sports

In exploring the connection between personality traits and success in sports, Jean A. Coleman delved into the nuanced relationship in various shooting disciplines. In her study, distinct personality qualities play a crucial role in determining achievement. Neuroticism levels vary across disciplines, impulsiveness aids in quick decision-making, introversion proves beneficial in accuracy-demanding events, and extraversion is advantageous in dynamic situations. Coleman emphasizes the importance of effective coping strategies in shooters's personal lives, highlighting the broader significance of psychological aspects in athletic performance across diverse sports (Coleman, 1980).

Comparably, Paweł Piepiora's research explored the character traits of winners in biathlon, fitness, mountaineering, and orienteering. The study contrasts champions from these sports—which include alpine skiing, snowboarding, and swimming—with their contemporaries. Champions tend to show lower levels of neuroticism and higher levels of extraversion and consciousness, according to the results of the Big Five personality model administered to them. These findings highlight the connection between particular personality qualities and performance in athletic efforts, providing insightful information on the psychological factors influencing success in individual sports (Piepiora, 2021).

To add, the 2014 study by Burdzicka-Wołowik and Góral-Radziszewska comprised 199 women between the ages of 17 and 36 who were divided into two groups: combat sports participants and non-athletes. Within the combat sports group, almost 50% held a master class in their respective sports, with an average training experience of 7.94. The study investigated gender perceptions and personality traits using instruments such as the Psychological Gender Inventory, Temperament Questionnaire, and EPI. The findings revealed that women participating in combat sports had higher levels of extraversion, indicating greater sociability, and lower neuroticism, showing better control of their emotions. By highlighting the significance of particular personality traits in athletic achievement, these findings offer insights into the psychological aspects of combat sports success (Burdzicka-Wołowik & Góral-Radziszewska, 2014).

2.3 Learning Ability Connection to Personality

Starting with a study by Stough that explored the complex relationship that exists between certain personality

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traits—introversion and extraversion in particular—and learning ability. The research shows a strong relationship between learning squeezes and unique personality traits, refuting the popular idea that personality and intelligence are unconnected. The results challenge the idea that there is a one-size-fits-all approach to education by indicating that different learning styles may be displayed by people with diverse personality features. Additionally, the study looks at the intricate relationships between personality traits, visual inspection time (IT), and intelligence quotient (IQ) test results. The study disproves the notion that personality or temperament variables are the only reasons for the relationship between IT and IQ, in contrast to certain earlier theories (Stough, 1996).

Turning now to Dennis Child's research, who makes a substantial addition to our knowledge of the connection between learning capacity and personality traits. It also emphasized the negative consequences of increased anxiety and neuroticism on academic performance, as well as the positive relationship between introversion and academic achievement, implying that introverted characteristics may be advantageous for effective learning. This study highlights the role that emotional stability plays in creating a positive learning environment and calls on teachers to identify and assist children who have different emotional needs. When taken as a whole, these studies deepen our understanding of the intricate relationship that exists between learning styles and personality traits in a range of educational settings, leading to a reassessment of traditional methods of instruction (Child, 1964).

2.4 Relation between Success in Fencing and Success

The 2016 study by Abdelkhalek Ibrahim Mohamed explored the complex relationship between fencing success and individual traits, with a particular focus on the impact of Personality Types A and B on the learning outcomes of female students practicing foil fencing. The study also looks at the relationship between fencing success and individual success factors. Studies focused on compound attack proficiency indicate that people with Type B personalities and personalities that include things like patience and efficient memorization are more adept at learning than people with Type A personalities. Our knowledge of the intricate interactions between unique personality features and success in fencing education has been expanded by this discovery. The study turns into an enlightening investigation of how particular personality traits may influence the educational process in the setting of fencing instruction (Mohamed, 2016).

An analysis of the personality traits of thirty female fencers competing at the national level was conducted by Williams and Colleagues in order to discern the characteristics associated with champion-level performance in fencing. The results show a unique profile with a constant drive for achievement combined with traits of forcefulness, hostility, independence, and caution. The key quality that distinguished elite fencers was, notably, dominance. This proved that there was a strong correlation between competitive fencing success and certain personality traits, such as dominance, leadership, and determination. In light of this, the results imply that fencing involves a distinct "sport type" mentality. This understanding raises an interesting finding: people, especially those who portray dominance, might have a higher chance of succeeding in the highly competitive field of fencing (Williams et al., 1970). Overall, it is shown that the more stability and extraversion within an individual, the more success they find in learning fencing.

3. Method

3.1 Population

This research focused on high school students at a suburban high school in New Jersey with a total population of 1,124. The student body is diverse, mostly consisting of middle-class individuals. The gender ratio is nearly equal, with 49% female and 51% male students (US News). These results can be relevant to many other high schools due to the wide range of students investigated.

3.2 Sample Selection

A new process was set up to collect important information from students who were joining, making sure that everything was organized and easily managed. The boys and girls had separate times for fencing practice, with boys

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going at 2:20 PM and girls at 4:00 PM, to make things run smoothly. When the students arrived, they were given a Google Form to fill out with important information. After getting permission, they filled out the form with details like their personal information, emergency contacts, and any medical concerns. Having the staggered schedule not only reduced crowds but also made it easier to focus on each group. After data collection, the information was transferred to a designated Google Sheets document to enhance accessibility and enable real-time updates.

3.3 Materials

Google Forms: Utilized for efficiently conducting surveys and automatically sorting responses from participants Google Sheets: Assisted in organizing survey data and creating bar graphs and correlation scatter plot graphs Chromebook: Distributed to each fencing participant as a means for them to complete the EPI test.

3.4 Implementation: Method Construction

In construction of the methodology, Mohamed's 2016 study design was replicated to investigate the impact of Personality Types A and B on female students' learning outcomes in foil fencing. Fencing was chosen as the focus sport due to its unique blend of cognitive and physical challenges. It requires athletes to make rapid, strategic decisions in real time and maintain composure under pressure. Unlike many other sports, fencing demands both mental agility and individual accountability, making it particularly well-suited for examining how personality characteristics shape learning outcomes (Mohamed, 2016). Seven participants from the fencing team, specifically first and second-year epee fencers, were selected for the study. Firstly, a student consent form was handed to each participant, which they, together with their parents, had to sign. The 57-question Eysenck Personality Inventory (EPI) was used to assess their personality traits. This was done to explore any possible connections between different personality types and learning achievements.

After assessing the EPI, all participants received a standardized fencing lesson, which was then recorded for further evaluation. In the brief five to seven-minute session, participants were taught a circle 6 opposition and straight attack. They were made to practice and alternate between these movements, completing ten repetitions of each. The lesson ended with a challenging random reactive drill, testing participants' decision-making skills and offering valuable insights into how personality traits can influence fencing performance. The standardized teaching approach aimed to create a controlled environment for evaluating the impact of personality traits on learning outcomes. Following this, the recorded footage was meticulously reviewed in collaboration with the fencing coach, and performance ratings were assigned to gauge participants' responses to the lesson.

The participants' performance in the uniform fencing lessons was measured and evaluated using a skill rating system ranging from 1 to 30, developed collaboratively by the researcher and the fencing coach. The goal of using this scale was to offer a more in-depth evaluation to specific components of the lesson. In the scale, 3 different 1-10 scales are used, which at the end of grading would all be added up. The first 1-10 scale refers to the learning achievement within the lesson, ranging from “Did not learn” (1) to “Learned” (10). It rates the subjects’ understanding and mastery of the fencing move, and assesses the participant’s understanding and retention of the fencing concept taught during the lesson. The second scale refers to the execution proficiency of the move in the lesson. The scale starts from “Weak and Hesitant” (1) to “Strong and Explosive” (10). Participants are graded based on how well they physically execute the taught motion, taking confidence and strength into account. The scale focuses on the quality of the physical performance of the subject. Lastly, the third scale measures the overall performance of the subject, which ranges from “Poorly Performed” (1) to “Well Performed” (10). This scale provides an unbiased evaluation of the individual's entire performance, including move execution. It offers a holistic judgment of both mental and physical engagement throughout the lesson.

By adopting Mohamed’s study design, our systematic methodology establishes a robust framework for exploring the intricate interplay between personality traits and the acquisition of fencing skills, specifically in the context of foil fencing. The careful participant selection process and the administration of the EPI contribute to the depth and reliability of my investigation, offering valuable insights into how distinct personality types may influence learning

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outcomes in fencing.

To assess the relationship between personality traits and fencing performance, correlation coefficient (r) was used to measure the strength and direction of linear relationships between the variables. The personality scores from the EPI and fencing performance scores were compared, and p-values were calculated to determine the statistical significance of each correlation. These tools allowed the study to evaluate whether traits like extraversion and neuroticism were meaningfully associated with participants' learning success.

4. Results

4.1 Eysenck Personality Test Results

Although the EPI evaluates each trait through a distinct set of questions, the results are conventionally reported as bipolar scales—extraversion vs. introversion and neuroticism vs. stability—rather than as four separate variables. Success in learning fencing may be correlated with personality traits, particularly extraversion/introversion and neuroticism/stability (Eysenck, Nias, & Cox, 1982). Figure 1 presented the individual responses of participants on the EPI test, whereby scores for extraversion/introversion and neuroticism/stability are measured on a 0-24 scale. Higher results in the neuroticism/stability category here imply a higher level of neuroticism, whereas higher scores in the extraversion/introversion category indicate a more outgoing personality. Lie scores, which are graded on a range of 0 to 9, are also included in the figure. A higher lie score indicates a participant's tendency to give socially accepted answers, suggesting a desire to project a more positive image of themselves, which may involve giving misleading or excessively positive answers.

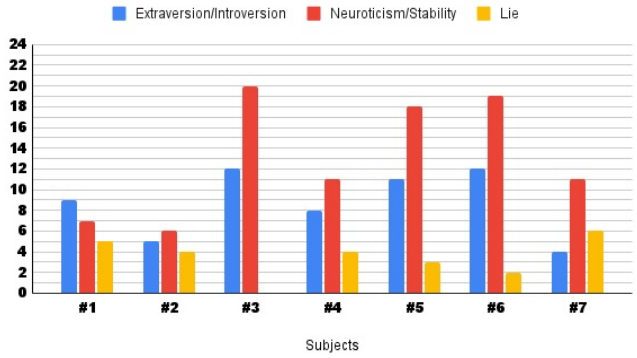

Figure 1: The results from the Eysenck Personality Test

4.2 Correlation Findings

A scatterplot showing the correlation between the individual's extraversion/introversion scores and fencing lesson grades is presented in Figure 2. Plotting the extraversion/introversion scores (which range from 0 to 24) against the participants' grades (which ranges from 0 to 30) offers a visual depiction of any possible relationship between personality factors and the ability to successfully master the fencing motion. The utilization of scatterplots facilitates the analysis of patterns and trends, providing valuable insights into the potential relationship between participant performance in the fencing class and variations in extraversion and introversion.

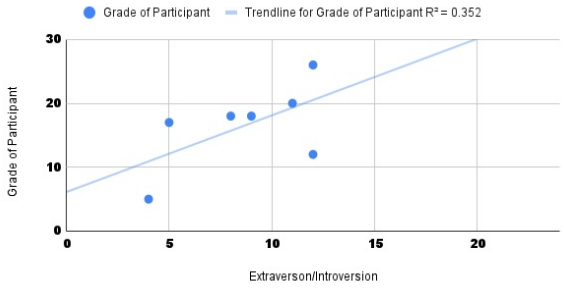

Figure 2: The correlation between the Learning Success and Extroversion/Introversion

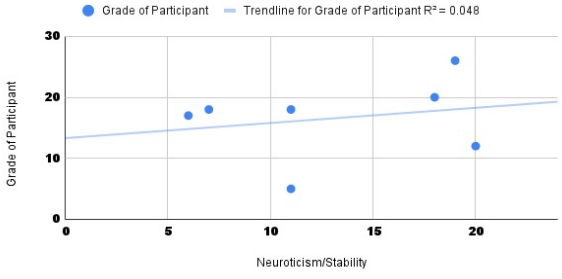

Figure 3: The correlation between learning success and neuroticism/stability

The scatter plot in Figure 3 shows the relationship between the participant's scores on neuroticism and stability

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and the lesson grades that correspond to them. The scatter plot illustrates how differences in the neuroticism/stability scores (which range from 0 to 24) may correspond to the participant's success in the fencing instruction, as indicated by their lesson grades which range from 0 to 30). Correlations between neuroticism/ stability score and better lesson performance can be determined by analyzing any obvious trends or patterns in the relationship between the two variables using the scatterplot.

5. Discussion

The information gathered throughout the study was intended to demonstrate the relationship between fencing learning success and personality types. The research examined the neuroticism/stability and extroversion/introversion personality traits. My specific goal was to determine whether more success in learning fencing had a positive association with increased extraversion and stability scores. In this study, the EPI test results of seven high school fencing players are analyzed.

5.1 Extraversion/Introversion and Learning Success

The results, which are presented in Figures 2 and 3, imply that extraversion and introversion may have an impact on how well high school students learn to fence. Higher extraversion levels are associated with better performance in learning fencing methods, according to the weak positive correlation (r^2=0.34) found between extraversion scores and fencing lesson grades. The r^2 result shows that there is a correlation between extraversion/introversion and lesson grades, but is not a strong link. The p-value of 0.24 indicates that this correlation is not statistically significant, likely due to the small sample size. These results suggest a possible trend, though not conclusive. This result is consistent with earlier research, such as the Ghaderi and Ghasemi study, which examined the connections between personality traits, emotional intelligence, and sports choices in teenage female athletes. Their results highlighted the importance of sociability and assertiveness in athletic activities and revealed a potential link between extraversion and a preference for team sports (Ghaderi & Ghasemi, 2012).

Furthermore, dominance was found to be a crucial quality linked to success in competitive fencing in WIlliam's study, which examined the personality qualities of elite female fencers. This supports the theory that people with higher extraversion levels may have dominant features that support assertiveness and leadership, traits that may help them succeed in learning fencing methods. The study's exceptional performance of Subject 6, who had the highest success grade and a much higher extraversion score, highlights the possible impact of strong personality traits on the development of fencing skills (Williams et al., 1970).

5.2 Neuroticism/Stability and Learning Success

Conversely, the accepted notion that emotional stability has a major influence on skill development is called into question by the weak positive connection found between neuroticism/stability scores and fencing lesson grades. While there appears to be a correlation in Figure 3 between neuroticism/stability scores and fencing lesson grades (r^2=0.048), the small percentage of explained variance suggests that neuroticism/stability may not have as much of an impact on learning outcomes as extraversion/introversion. The p-value was 0.81, reinforcing that this correlation is not statistically significant. This study emphasized efficient coping techniques above emotional stability alone, which is consistent with Coleman's research on personality qualities and athletic performance. While Child's study highlighted the negative impact of anxiety on academic performance, the current research contributes to a deeper understanding of the intricate relationship between neuroticism/stability and skill development.

Emotional stability may not have a substantial influence on a participant's capacity to acquire fencing methods, according to the weak positive correlation shown between neuroticism/stability scores and fencing lesson grades. The present findings cast doubt on this idea in the context of fencing, despite the fact that prior research has frequently linked neuroticism to unfavorable outcomes, such as poorer academic performance and higher anxiety (Coleman, 1980). Emotional stability might not be the only component in learning the fencing method, as evidenced by the comparatively poor link between neuroticism/stability scores and fencing lesson grades. Rather, factors like resilience

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and efficient coping mechanisms might be more important in overcoming obstacles and failures during the learning process. It is clear by looking back at Figure 1, which shows each subject's individual results on the EPI test, that the participant scores corroborate the relationships between fencing lesson grades and personality traits that have been observed. While the association between extraversion and neuroticism/stability scores appears to be less apparent, subjects with greater extraversion scores are also likely to demonstrate higher success grades.

5.3 Interpreting Outliers Within the Broader Context

Subject 6 demonstrated notably high performance in the fencing lesson alongside a high extraversion score. This result supports the broader trend observed in the study, suggesting that individuals with higher extraversion may possess behavioral traits—such as assertiveness, confidence, and dominance—that enhance their learning outcomes. These characteristics likely contributed to Subject 6's ability to respond actively to instruction, adapt quickly to corrections, and approach the lesson with resilience and energy. Notably, a study of elite female fencers found that successful athletes often displayed high levels of dominance and leadership, further reinforcing the idea that such traits are linked to fencing success (Williams et al., 1970). While individual variation is inevitable in any psychological study, the case of Subject 6 exemplifies how certain personality profiles may naturally align with the demands of the sport. Instead of drawing attention away from the group findings, this example provides a deeper layer of insight into how personality traits manifest in practice. It also highlights the importance of designing instruction that leverages these personality-driven strengths, particularly when working with students who may benefit from a more interactive or challenge-based learning environment.

6. Conclusion

This study explored the topics of extraversion/introversion and neuroticism/stability in an effort to better understand the complex link between personality traits and learning outcomes in high school fencing. After the EPI was administered and fencing lesson performance was assessed, a detailed understanding of how individual personality characteristics could influence high school student's learning of fencing techniques emerged.

6.1 Findings

The study's conclusion provided insightful information on how personality characteristics and learning success interact in the context of fencing. Higher extraversion levels may be associated with slightly greater performance when learning fencing methods, according to the weak positive connection found between extraversion and fencing lesson grades. This result is consistent with earlier studies that found a relationship between competitive fencing success and extraverted qualities like dominance and aggressiveness.

On the other hand, the belief that emotional stability alone has a substantial impact on skill development is called into question by the weakly positive connection shown between neuroticism/stability scores and fencing lesson grades. Rather, the findings emphasize the complexity of fencing mastery by emphasizing the value of resilience and practical learning skills in overcoming setbacks and failures during the learning process.

6.2 Limitations

A primary limitation of the study is that performance assessments were conducted by only two evaluators (the researcher and the fencing coach) may introduce bias. A better understanding could be gained on how personality affects fencing success by seeing the impact of different judges. Also, it's not clear if the link between fencing success and personality stays true over time. Looking at how skills last over time could give new information about these connections.

To add, it is unclear if the discovered relationship between fencing success and personality traits will grow true over time. An investigation into the difference in skill retention over long periods of time could provide important new information about how long-lasting these connections are. Furthermore, the absence of specific data regarding

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teaching strategies encompasses another problem, which is the incomplete analysis of the intricate relationship between different instructional approaches and individual personality traits. Future investigation addressing these limitations could pave the way for a more comprehensive understanding of the complex dynamics governing the relationship between personality traits, teaching methodologies, and the learning and retention of fencing skills.

Lastly, the limited sample size of only seven participants presents a significant constraint on the generalizability and statistical power of the study. With such a small group, the results are more susceptible to being influenced by individual variability, making it difficult to draw definitive conclusions about broader populations of high school fencers. The intention of this study is not to establish universal conclusions, but rather to highlight potential trends and generate hypotheses regarding the relationship between personality traits and fencing performance. Additionally, the research was conducted within a single class at one regional high school, which may further limit its applicability to athletes from other geographic or demographic contexts. Despite these limitations, the patterns observed may serve as a useful foundation for subsequent studies with larger, more diverse participant groups.

6.3 Future Directions

In order to improve the strength of the correlation under inquiry, future studies should examine the effects of multiple graders on the relationship between personality factors and fencing success. Moreover, exploring the differences in skill retention over extended periods of time may provide a more profound understanding of the associations between fencing success and personality factors. This long-term strategy has the potential to clarify the constant nature of these connections. In addition, making the sample bigger and including different demographics of people could ensure that the study's findings are valid and would lead to better understanding.

Further research efforts could also aim to analyze the complex interaction between various instructional strategies and individual personality characteristics, thus clarifying the ways in which instructional strategies can be modified to maximize learning outcomes according to the distinct traits of each fencer. Researchers can take a journey that not only broadens our understanding of the complex relationship between personality traits and learning outcomes in the dynamic field of fencing instruction, but also paves the way for customized interventions that maximize individual learning experiences and advance the field of sports psychology to new highs of understanding.

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