

# The Relationship Between Personality and Dominant Learning Style

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## ABSTRACT

Learning styles and personality are essential ingredients in deciding people's learning efficiency. This research explored the relationship between personality and dominant learning style, aiming at offering guidance for teenagers and teachers to adopt the learning style and corresponding pedagogy with the highest learning efficiency according to students' personality. The targeted sample of this research was 33 teenagers (aged from 13-18). As they are in their formative years and the main proportion of them are students, education methods are especially important for their growth. MBTI personality model was used to classify participants' personality types, and an experiment was designed to measure their dominant learning style based on correction rates. The result showed no obvious relationship between personality and the dominant learning style. Given teenagers with different personality types benefit from mixed learning styles, teachers should not limit students from learning through multiple modalities. As there are still lots of unexplored topics about how to improve teenagers' learning efficiency, more research should be conducted to modify current education methods and increase teenagers' learning efficiency. The area explored by this research is of paramount significance for the ability growth of the next generation.

**Keywords:** *Learning styles, Learning Efficiency, Teenagers, Personality.*

## 1. INTRODUCTION

Learning styles and personality as related factors to academic achievements have long been the center of discussion. Many studies indicate that learning styles, referring to an individual's methods, usually including sight, touch and sound, to process information, are an essential element in determining learning efficiency [1, 2]. As students adopt different learning styles continuously, learning styles play an important role in their life-long learning processes. Lots of researchers have conducted studies from the personality angle, exploring the influence of personality on the adoption of learning styles [3-5].

This research uses the Visual-Auditory-Kinesthetic learning styles (VAK) model as a basis to classify learning styles. The original Visual-Auditory-Kinesthetic learning styles model is first proposed by psychologists and teaching (of children) specialists such as Fernald, Keller, Orton, Gillingham, Stillman, and Montessori in the 1920s. It classifies people's learning styles into three categories based on the modalities people learn—VAK stands for Visual, Auditory, and

Kinesthetic (Tactile) [4]. According to the VAK model, most people possess a dominant or preferred learning style, which means that people can learn most effectively through one of these channels, while some people have combined learning styles. These three learning styles are as follows:

- Someone with a visual dominant learning style prefer to learn through seeing or observing things, encompassing pictures, demonstrations, diagrams, etc. Their performance is the best under written instructions.
- Someone with an auditory dominant learning style prefer to learn through listening to things, encompassing spoken words, recordings, sounds and noises, etc. Their performance is the best under verbal instructions.
- Someone with a kinesthetic dominant learning style prefer to learn through physical experience, encompassing touching, sporting, holding, etc. Their performance is the best in activities.

However, most research focuses on a specific academic field, such as agriculture and pharmacy, and there is limited research related to the memorizing process of learning. Further, past studies use self-assessment as the measurement of the dominant learning style, which might cause deviations as the result is concluded by one's own preferences and perception. Thus, an experiment is designed for this research to measure teenagers' ability to learn through three modalities based on the VAK model. The study population is teenagers aging from 13 to 18, as they are in their formative years and the main proportion of them are students. Education methods are therefore especially important for their growth. This research aims at offering guidance for teenagers and teachers to adopt the learning style with the highest learning efficiency, thereby helping them to revise their learning styles and education methods.

Also, Myers-Briggs Type on Indicator (MBTI), proposed by Swiss psychoanalyst Carl Jung in 1921 in the book *Psychological Types*, is used as a personality model in this research to decide participants' personality traits. It classifies human recognition into four parts: Attitudes (introversion/extraversion), Perceiving Functions (sensing/intuition), Judging Functions (thinking/feeling), and Lifestyle Preference (judging/perceiving). The corresponding test is formulated by the researchers Katharine Cook Briggs and her daughter Isabel Briggs Myers. The personality test used for this research is the Chinese version of the Myers-Briggs Type Indicator (MBTI) personality test (28 questions), which is translated into Chinese by Miao according to Chinese cultural background and language habits.

This research explores the relationship between personality and dominant learning styles. It hypothesizes that the four personality types of MBTI predict the dominant learning style. Data is collected through the questionnaire and experiment to determine the relationship between personality types and the dominant learning style. The learning styles according to the VAK model are visual, auditory, and kinesthetic. The four dichotomies represented in the analysis of personality types are Extraversion vs. Introversion, Sensing vs. Intuition, Thinking vs. Feeling, and Judging vs. Perceiving.

## 2. METHODS

### 2.1. Participants

This research selects 33 healthy teenagers (aging from 13 to 18) from two high schools,

Shanghai United International School Gubei Campus and Beijing 21st Century International School, through random sampling. The sample involves 13 male

students and 20 female students. They are recruited offline and are currently learning at high schools with 7 students coming from grade 10, 19 students coming from grade 11, and 7 students coming from grade 12. All of them are born and raised in China with Mandarin as their native language.

Before filling the questionnaire and participating in the experiment, they are asked to check the informed consent and make consent. They do not get rewards for being participants.

Participants are assured of the anonymity and confidentiality of their responses, given an experiment code to replace their real names. In the informed consent, they are get fully informed about what the research entails and their right to withdraw from the experiment at any point without giving reasons. This experiment does not cover deceptions.

### 2.2. Materials and Design

The independent variable is the personality type of participants, which is collected by questionnaires. The dependent variable is the correction rate of participants.

**The Collection of Basic Information.** The first section of the questionnaire is used to collect the basic information of participants. The basic information including gender, age, and grade.

**The Measurement of the Independent Variable: Personality.** The second section of the questionnaire is used to measure the personality type of participants according to their preferences. According to the research conducted by Miao and Huang, the reliability ( $\alpha$  level) of the MBTI-G test (97 questions) is the highest for the Attitudes dimension, which is 0.725, and the lowest for judging functions, which is 0.541 [7]. The research done by Cai evinces that the average reliability ( $\alpha$  level) of the MBTI-M test is between 0.86 and 0.94 for its four dimensions. It also indicates that the validity is high with AGFI=0.949 and 0.967, and the model also has a high fitting degree with  $\chi^2=1488.26$  and  $p = 1.00$  [8]. These two research use samples composed of Chinese people, indicating the high reliability and validity of the MBTI test to Chinese people.

**The Measurement of the Dependent Variable: The Dominant Learning Style.** The experiment intends to decide participants' dominant learning styles based on the VAK model. There are three sections respectively for each learning style—visual, auditory, and kinesthetic, and participants are asked to learn three pieces of materials in each section through the corresponding way.

Each learning material is a recipe composed of nine steps. In order to ensure the novelty of the learning material to participants, the relationship between the raw materials described in the recipe is illogic. In the

visual section, one sentence and one picture are displayed at a time for each step. In the auditory section, there are three recordings, and participants listen to one recording for each recipe with one step described by one sentence. In the kinesthetic section, participants need to click and drag pictures to remember recipes. After learning each recipe, they need to answer one multiple-choice asking them the dish name, which examines their memory about the raw materials of the dish.

The experiment is conducted through PsychoPy, and the correction rate of the nine questions for each participant will be recorded on it.



**Figure 1.** The Visual, Auditory, Kinesthetic Presentation Sessions and the Multiple-Choice Session of the Experiment

### 2.3. Procedure

At first, the participants read the informed consent and sign it, which means they consent to participate in the experiment without rewards.

Then, they need to fill up the questionnaire, respondents need to first answer the basic information. They have to answer 28 questions of the MBTI personality test. The time for learning one recipe in all the sections is 32s. One scene is described in one question, and respondents need to make a choice that is more suitable for them between two options. The questionnaire takes 8.066 minutes in total on average.

At last, the participants enter the experiment session measuring the dominant learning style. They need to learn 9 recipes one by one by using three learning styles—visual, auditory, and kinesthetic. The order of the three sections is arranged randomly for each participant. After learning each recipe, they need to answer a multiple-choice question. The experiment takes 9.430 minutes in total on average.

### 2.4. Data Analysis

The results of questionnaire and the experiment are entered into IBM SPSS Statistics to be analyzed. The analysis method is correlation.

## 3. RESEARCH RESULTS

### 3.1. Descriptive Statistics

#### 3.1.1. Correction Rate

There are three questions for each section, and each participant answers nine questions after three sections—visual, auditory, and kinesthetic. The correction rate is calculated and recorded for each section.

The average correction rates for the visual, auditory, and kinesthetic sessions of the experiment are 0.798, 0.717, and 0.798. The standard deviation of the correction rates for the visual, auditory, and kinesthetic sessions are 0.263, 0.265, and 0.249. The mode of the correction rates for the visual, auditory, and kinesthetic sessions are 1, 0.667, and 1.

#### 3.1.2. Personality Types

MBTI personality test classifies people’s personalities from 4 aspects: attitudes, perceiving functions, judging functions, and lifestyle preferences. In the research’s version of 28 questions, 7 questions correspond to one aspect.

According to the MBTI personality test measuring the four dimensions of personality, 11 participants are extroverted, and 22 participants are introverted; 15 participants prefer intuitions, and 18 participants prefer sensing; 20 participants prefer feeling, and 13 participants prefer thinking; 19 participants prefer judging, and 14 participants prefer perception.

### 3.2. Correlation analysis results

#### 3.2.1. Analysis Methods

The relationship between the personality types (independent variable) and the correction rates for learning styles is measured by Pearson coefficient and two-tailed significance. The significance level is 0.05 for this research.

After the data is collected, SPSS is used to find the correlation between the personality types (independent variable) and level of V/A/K dominance (named as ‘Learning Styles Dominance’ and is the dependent variable).

If there is a significant relationship between two variables ( $p < 0.05$ ), Pearson correlation analysis is conducted to determine the strength of the correlation. Pearson coefficient ( $r$ -value) will be examined.

#### 3.2.2. Analysis Results

As there are four aspects of personality, the correlation between each aspect and the learning style

dominance is determined. The corresponding data is displayed in Table 1, 2, 3, 4. According to the data from the table, there is no significant correlation between all the learning styles and attitudes ( $r = -.028, p = .879$ ;  $r = -.054, p = .765$ ;  $r = -.233, p = .192$ ). The same is applied to other three aspects of personality types—perceiving function ( $r = -.071, r = .135, r = .090$ ;  $p = .693, p = .455, p = .618$ ), judging function ( $r = .090, p = .620$ ;  $r = -.160, p = .372$ ;  $r = .010, p = .955$ ), and lifestyle preference ( $r = .038, p = .832$ ;  $r = .148, p = .413$ ;  $r = .124, p = .493$ ).

**Table 1.** Results of correlation between personality types and learning styles’ dimension

| Personality Types     | Learning Style Dominance | Style $r$ | $p$ (two-tailed) |
|-----------------------|--------------------------|-----------|------------------|
| Attitudes             | Visual                   | -.028     | .879             |
|                       | Auditory                 | -.054     | .765             |
|                       | Kinesthetic              | .233      | .192             |
| Perceiving Functions  | Visual                   | -.071     | .693             |
|                       | Auditory                 | .135      | .455             |
|                       | Kinesthetic              | .09       | .618             |
| Judging Function      | Visual                   | .09       | .62              |
|                       | Auditory                 | -.16      | .372             |
|                       | Kinesthetic              | .01       | .955             |
| Lifestyle Preferences | Visual                   | 0.038     | 0.832            |
|                       | Auditory                 | 0.148     | 0.413            |
|                       | Kinesthetic              | 0.124     | 0.493            |

**4. DISCUSSION**

A total of 33 responses are collected for this research. For each personality type, the null hypothesis is that the dominant learning style is independent of the personality type for teenagers, and the alternative hypothesis is that the dominant learning style is dependent upon personality types for teenagers. The results of the data analysis do not reject the alternative hypothesis for each personality type, meaning that there is no evidence to support the significant relationship between the four personality types and the dominant learning style for teenagers.

**4.1. Comparison to the past research**

Compared to the past research using the self-assessment of the dominant learning style, this research evinces a different result that there is no relationship between personality and the dominant learning style [4, 9].

The generality of the memorizing may contribute to this difference. As memorizing is constantly practiced in the learning process, teenagers of different personality types may have similar proficiency in each learning style to memorize information. As a result, there is no obvious relationship between personality types and the dominant learning style when the experiment tests teenagers’ memory. In addition, there are not enough questions designed in the experiment, which may prevent the indication of the relationship. Thirdly, according to the results of the research, teenagers with similar personality types have different dominant learning styles, which is understandable as nobody learns every object exactly the same way. Thus, relationship cannot be detected between personality types and the dominant learning style. According to Solomon and Felder, people use different learning styles under different circumstances [10].

**4.2. Consideration For Further Study**

According to 4.1, revisions can be made to improve further studies in this area:

- Repeat this research, but design more recipes and corresponding questions for each learning style (based on VAK model); the insufficient questions may make the measurement of dominant learning styles inaccurate.
- Conduct the study with participants from more high schools in China; participants from more locations can make the personality types diverse to prevent skewing the data.
- Conduct the study in control of experimental environments; since in this research participants perform the experiment in different environments, which may render participants distracted, the correction rate of the questions may not determine participants’ dominant learning styles accurately.
- Conduct the study using another version personality test or the MBTI personality test with more questions; perhaps MBTI personality test with 28 questions does not cover enough questions to measure participants’ personality types; or MBTI is not related to dominant learning styles, so other criteria, such as the Big Five personality test can be considered.

## 5. CONCLUSION

In exploring the relationship between personality and dominant learning style, the findings of this research show that the personality types of teenagers do not affect their dominant learning style. This suggests that it is advisable and effective to combine different learning styles in education. If teenagers with different personality types benefit from mixed learning styles, teachers should not limit students from learning through multiple modalities. Though this research does not reveal the relationship between teenagers' personality types and their dominant learning style, further studies with less limitations are needed to support this conclusion. There are still a lot of unexplored topics about how to improve teenagers' learning efficiency, which should be paid more attention to as an important part to improve education methods and help personal growth. In this way, teenagers' learning styles and strategies can be further personalized, which is beneficial to the next generation.

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