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Research Article

Relationship between Extroversion Personality and Learning Strategy-based on MBTI Test

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Abstract

This study explores the relationship between extroversion personality traits, as measured by the Myers-Briggs Type Indicator (MBTI) test, and learning strategy preferences among English language learners. Employing a quantitative methodology, data were collected from a sample of 1621 participants to investigate the predominant extroversion personality traits and differences in learning strategy selection. The research background emphasizes the significance of understanding individual differences in personality traits and their impact on learning behaviors. The study aims to discern whether extroverted individuals exhibit distinct preferences for specific learning strategies, particularly in metacognition, cognition, compensation, affect, and social interaction. By elucidating these relationships, educators can tailor instructional approaches better to accommodate learners' diverse needs and strengths, ultimately enhancing educational outcomes.

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1. Introduction

In the field of language education, understanding the intricacies of individual differences has become a focus for researchers and educators. Language acquisition is a multifaceted process that includes cognitive, emotional, and social aspects (Ellis, 2015; Lightbown & Spada, 2019). Among the countless factors that form this process, individual differences in personality have become influencing factors. Extraversion, characterized by a preference for social interaction, external stimulation, and confidence, stands out as a trait that may significantly shape the dynamics of language learning (MacIntyre, 2017; Dörnyei, 2005). The link between extraversion and language acquisition is recognized in the general psychological literature, but its subtle impact on the choice and application of learning strategies, particularly in the context of English language learning, remains a relatively unexplored area.

The significance of studying the relationship between extroversion personality and learning strategies is that it has the potential to inform teaching practices tailored to the unique needs of learners (Brown, 2019; Elder & Paul, 2021). Recognizing that individuals have different preferences in how they approach and engage in language learning activities, educators can develop targeted interventions that create more beneficial and effective learning environments (Fleming & Mills, 2017). In addition, this exploration contributes to the ongoing discussion of personalized learning approaches, providing valuable insights into language curriculum design that resonates with a variety of extroverted language learners (Hattie & Zierer, 2018; Tomlinson & Imbeau, 2023).

While the existing literature recognizes the role of personality in language learning, there are clear gaps in fully revealing the interactions between extraversion and specific learning strategies, especially in the field of English language acquisition. Current research tends to be broad and lacks the granularity needed to make meaningful connections between extroversion and the subtle choices learners make during language learning. Addressing this gap is critical for educators, curriculum developers, and language program managers to understand the different needs of extroverted language learners.

The main objective of this study was to systematically examine the relationship between extraversion as determined by the MBTI test and English learners' choice and implementation of learning strategies, in addition to providing practical insights that can be translated into informed teaching practices. By achieving these goals, this research aspires to contribute to the existing body of knowledge in language education, providing a nuanced understanding of how extraversion shapes the language learning experience. The findings are intended to provide educators with evidence-based strategies to address the unique needs of extroverted learners and foster a more inclusive and effective language learning environment.

2. Literature review

Learning Strategies: Language learning strategies represent a multifaceted array of cognitive and metacognitive processes strategically employed by individuals to optimize their language acquisition endeavors (Oxford, 1992; Chamot & O'Malley, 1994; Cohen, 1998). Oxford's seminal work serves as a foundational reference, illuminating the comprehensive nature of these strategies, which encompass not only memory enhancement techniques but also cognitive organization skills. These skills facilitate the effective storage and retrieval of language elements, providing learners with a robust toolkit for navigating the complexities of language acquisition (Chamot & O'Malley, 1994).

Furthermore, social interaction strategies, as highlighted by influential theorists such as Vygotsky (1978), are recognized as pivotal components in the language learning process. The collaborative nature of language learning is emphasized, emphasizing the role of social interactions in fostering language development and cultural understanding. Learners, through engagement with peers, mentors, or native speakers, not only enhance their linguistic skills but also gain insights into the pragmatic use of language in authentic contexts (Vygotsky, 1978; Cohen, 1998).

The importance of these multifaceted strategies has been consistently underscored in educational research, with Cohen (1998) emphasizing the necessity of understanding these processes. Cohen's advocacy for a nuanced comprehension of language learning strategies emphasizes their dynamic nature and the need for tailored educational interventions. Recognizing the individual needs and preferences of language learners is crucial, as it allows educators to design interventions that align with diverse learning styles and enhance the overall language learning experience.

As researchers delve deeper into the intricacies of language learning strategies, their work becomes instrumental in informing pedagogical practices that promote a more personalized and effective language learning experience (Oxford, 1992; Cohen, 1998). Oxford's contributions have spurred ongoing investigations into the adaptability and efficacy of various strategies, contributing to the evolution of language teaching methodologies. The dynamic interplay between research and practice in the realm of language learning strategies ensures a continual refinement of pedagogical approaches, ultimately enhancing the effectiveness of language education.

Personality and Learning: The significance of personality in shaping learning behaviors has been a pervasive and enduring theme across diverse academic disciplines. In their seminal research, Ackerman and Heggestad (1997) made noteworthy contributions by highlighting the multifaceted impact of personality traits on learning, emphasizing their pivotal role in influencing cognitive, emotional, and social dimensions. Their work laid the groundwork for understanding the intricate ways in which individual differences in personality contribute to the complexity of the learning process.

In the specific context of language learning, studies such as those conducted by Dewaele and MacIntyre (2014) have significantly advanced our comprehension of the connections between personality traits and language proficiency. These investigations unveiled nuanced relationships

that extend well beyond mere linguistic aptitude, shedding light on how personality factors can intricately influence language learning outcomes. The revelations from studies like these have not only broadened our understanding of language acquisition but have also catalyzed subsequent investigations, compelling scholars to delve even deeper into the complex and dynamic interplay between personality traits and the language learning process.

Furthermore, the seminal work of Dörnyei (2005) has provided valuable insights into the motivational aspects of language learning, offering a comprehensive perspective on how personality factors can significantly impact learners' engagement with language acquisition strategies. Dörnyei's research underscores the importance of considering individual differences in personality as key determinants of learners' motivation, shaping their willingness to invest time and effort into language learning endeavors.

As researchers continue to expand the discourse on personality and learning, a comprehensive understanding of how individual traits, such as extroversion, shape the selection and effectiveness of learning strategies is emerging as a critical area for exploration (Ackerman & Heggestad, 1997; Dewaele & MacIntyre, 2014; Dörnyei, 2005). The rich tapestry of research contributions from these scholars not only informs our understanding of the intricate connections between personality and learning but also opens avenues for practical applications, guiding educators and practitioners in tailoring effective pedagogical approaches that consider the diverse and influential role of personality in the language learning journey.

MBTI as a Personality Assessment Tool: The Myers-Briggs Type Indicator (MBTI), devised by Katharine Cook Briggs and her daughter Isabel Briggs Myers, stands as a venerable and widely employed psychometric tool for categorizing individuals based on their preferences in perceiving and judging information (Myers et al., 1998). Originally rooted in Jungian psychology, this instrument has gained widespread recognition for its versatility across different domains, including education and organizational contexts (Furnham, 1996; Myers & McCaulley, 1985).

Recent research has continued to affirm the relevance of the MBTI in understanding individual differences in learning styles, cognitive preferences, and decision-making processes, positioning it as an enduring and adaptable tool in educational research (Dabke & Subramaniam, 2021). In the educational realm, the MBTI has been employed to discern individual learning preferences and cognitive styles, contributing to the development of tailored teaching methods (Harrington, 2019; Truell, 2020). Acknowledging the evolving landscape of education, recent studies have demonstrated the MBTI's utility in illuminating cognitive functions and emphasizing personality dimensions, such as extroversion (Harrington, 2019; Truell, 2020).

The MBTI serves as a valuable instrument for investigating the intricate relationship between personality and learning by providing a structured framework that delineates individuals' preferences for gathering information and making decisions (Pittenger, 2005; Segal, 2015). In the context of researching the interplay between personality traits and learning strategies, the MBTI remains a robust tool that allows for a systematic examination of how diverse personality traits influence the adoption of learning strategies in various educational settings (Dabke &

Subramaniam, 2021). Recent scholarly work has further emphasized the importance of considering personality dimensions, including extroversion, in understanding how individuals approach and engage with the learning process in contemporary educational environments (Fong, 2023; Wang & Wang, 2022). The ongoing utilization and exploration of the MBTI in recent research underscore its continued relevance and applicability in advancing our understanding of the complex relationship between personality and learning.

Extroversion Personality: Extroversion, a cornerstone in the study of personality, is considered a fundamental dimension defined by traits such as sociability, assertiveness, and a preference for external stimulation (McCrae & Costa, 1987). According to McCrae and Costa's Five-Factor Model (FFM), extroversion is one of the five major personality factors that contribute to an individual's overall personality profile. Extroverted individuals are often characterized by their heightened desire for social interactions, a proclivity for expressive communication, and a distinct propensity for active engagement with their immediate surroundings (Dewaele & MacIntyre, 2014). These traits, collectively forming the extroverted personality profile, have been recognized as influential in shaping behaviors across various contexts, including educational settings (Asendorpf & Denissen, 2006). Within the realm of educational psychology, researchers have extensively explored the multifaceted influence of extroversion on various aspects of behavior, cognition, and learning preferences (Bempechat & London, 2014; Graziano et al., 2007). Extroverted students, for instance, may exhibit a preference for collaborative learning environments, thrive in group discussions, and actively seek opportunities for social interactions that facilitate their learning experience (Dunn, 2000). The exploration of extroversion's impact on learning preferences has been instrumental in uncovering the dynamics of how individual differences contribute to the effectiveness of educational interventions.

Extroversion's significance in the context of language learning and its connection to specific learning strategies have also been acknowledged in previous studies (Dewaele & MacIntyre, 2014). For instance, Dewaele and MacIntyre found that extroverted language learners tend to exhibit higher levels of language proficiency, emphasizing the potential role of extroversion in facilitating verbal communication and engagement in language learning activities. Moreover, studies examining the relationship between extroversion and technology-mediated language learning have identified extroverted individuals more likely to engage actively in online language-learning communities and collaborative platforms (Blake, 2013).

3. Methodology

This study uses a mixture of quantitative and qualitative research methods, characterized by survey design, to provide a structured and systematic approach for collecting and analyzing data related to different personalities and learning strategies. This approach offers several advantages for investigating a large sample of participants and allows for the exploration of patterns, relationships, and trends in the collected data (Creswell, 2014). Therefore, the following research questions are raised:

What are the predominant extroversion personality traits exhibited among a sample of English language learners, as measured by the MBTI?

What are the differences in the choice of learning strategies among English learners with different personality traits?

A two-part questionnaire was employed for data collection. Two self-report scales were used to measure learning styles and learning strategies respectively. The MBTI-M form is used to assess psychological types, and the questionnaire based on the Oxford Classification System (SILL) is used to measure strategy use. In addition, MBTI-M forms have been translated and proven to be valid and reliable for Chinese students (Cai et al., 2001). In pilot studies, SILL needs to be translated and revised to ensure its validity and reliability.

The version used in this study is MBTI-M. At the same time, individuals may be dominant on one or both poles of the six scales, the MBTI assumes that the score only shows respondents' preference for one or the opposite pole that represents the most frequent way they behave in their daily lives. These four scales are generally considered to be the four main aspects of learning, in which 16 combination types may arise. MBTI-M is designed to reveal personality preferences on four dimensions: Extroversion (E), Introversion (I), Sensing (S), Intuition (N), Thinking (T), Feeling (F), Judging (J) and Perceiving (P). There are 21 items on EI dimension, 26 items on SN dimension, 24 items on TF dimension, and 22 items on JP dimensions. In fact, MBTI is based on the research of Carl Jung, it reflects the theory that the behavior in daily life is a manifestation of underlying stable and unchanging preferences for certain ways of functioning (Ehrman & Oxford 1988). MBTI theory posits that people have individual preferences relating to what they pay attention to, how they make decisions, draw conclusions as well as approach and respond to tasks. This research will focus on extroversion personality, known as ESTP ESFP ENFP ENTP ESTJ ESFJ ENFJ ENTJ, as shown in Table 1.

Attitude		Function		Key Feature
		Main function	Subsidiary function	
Introversion (I)	Judging (J)	Sensing (S)	Thinking (T)	Looker
			Feeling (F)	Guardian
		Intuition (N)	Thinking (T)	Expert
			Feeling (F)	Guide
		Thinking (T)	Sensing (S)	Craftsman

	Perceiving (P)		Intuition (N)	Logician
		Feeling (F)	Sensing (S)	Artist
			Intuition (N)	Intervener
Extroversion （E）	Perceiving (P)	Sensing (S)	Thinking (T)	Entrepreneur
			Feeling (F)	Performer
		Intuition (N)	Thinking (T)	Inventor
			Feeling (F)	Dreamer
	Judging (J)	Thinking (T)	Sensing (S)	General manager
			Intuition (N)	Commander
		Feeling (F)	Sensing (S)	Pretor
			Intuition (N)	Educator

Table 1, The 16 personality traits of MBTI

SILL is the most widely used metric for policy use. The version chosen for this study is an 80-item scale for intermediate foreign language learners. For each statement in the list, respondents were given five choices, ranging from "never or almost never true" to "always or almost always true." They rated it on a five-point Likert scale. All projects represent specific strategies used throughout the learning process rather than being linked to a specific task (Cohen, 1998). Although the original SILL, which purportedly included six integrated strategy groups, has been extensively examined in terms of its validity and reliability (Oxford & berry-stock 1995), it still needs to be tested to develop a suitable SILL for the subjects in this study. The translated version was tested on 35 English majors. The retest technique is used again to determine its reliability. Then, it was sent to some teachers to ask for their opinions and to revise or delete some items. In the main study, the final version with 55 entries had a Cronbach alpha of .92. The reliability of 14 policy sets is shown in the following Table 2:

Strategies	Strategies sets	Items	Alpha
Memory strategy	Association	6	.7427
	Structured review	3	.7044

Cognitive strategy	Rehearsal	6	.7557
	Practice	4	.7667
	Sending and receiving message	5	.7469
	Transferring and translation	5	.7229
Compensatory strategy	Overcoming limitations	5	.7276
Metacognitive strategy	Selection	2	.7496
	Planning	5	.7064
	Self-evaluation	3	.7004
Affective strategy	Encouragement	2	.7558
	Controlling one's emotions	3	.7897
Social strategy	Cooperation	4	.7948
	Empathizing with others	2	.7958

Table 2. Reliabilities of the 14 sets of language learning strategies

The questionnaire was distributed online to 1,621 Chinese English major students in the universities across the province and obtained their consent. This study employed snowball sampling as a data collection method because it efficiently reached a broad and diverse pool of participants within a given time frame and resources (Creswell 2014). Initially, a group of students from different universities were invited to participate in the survey and then encouraged to share the survey link with their peers. In order to strictly control the number of years the students studied English, the participants were all sophomores. This approach helps to reach Chinese university students more broadly, ensuring a more comprehensive representation of diverse institutions and backgrounds. Snowball sampling is particularly useful in reaching students from different regions, disciplines, and English proficiency levels because it allows for an organic expansion of the participant pool, capturing a richer diversity of perspectives and experiences. A total of 866 people participated in the SILL test.

Firstly, the collected data was sorted out to ensure the convenience of analysis. The data was put into the social science statistics package 14.0, and the normal distribution was first tested. Both

descriptive and inferential statistics were used. In the first problem, descriptive statistics were used to find the main personality groups. The second problem used One ANOVA test.

4. Findings

As can be seen from the data of 1621 participants, in general, the subjects were evenly divided between the two, with 53.42% extroverts and 46.58% introverts. Among the extroverted types, the ENFP personality type emerges as the most prevalent, constituting 27.25% of the total sample. This suggests a trend towards sociability, openness, and a preference for external stimulation among a significant portion of the participants. Within the extroverted category, there is a notable diversity of personality types. The ESTP, ESFP, ENTP, and ESTJ types each contribute significantly, albeit with varying frequencies. This diversity suggests that extroversion manifests differently among individuals, with some leaning towards spontaneity and adaptability (ESTP, ESFP), while others exhibit more strategic and visionary tendencies (ENTP, ESTJ). The ESFJ, ENFJ, and ENTJ personality types appear less frequently in the data, collectively comprising only 16.52% of the extroverted participants. These types, characterized by their warmth, empathy, and leadership qualities, represent a smaller proportion of the sample, indicating that while extroversion is prevalent, certain nuanced expressions of it are less common.

extroversion personality					N	%
ESTP N=100 (11.55%)	ESFP N=126 （14.55%）	ENFP N=236 （27.25%）	ENTP N=136 （15.70%）	T F	456 410	52.66% 47.34%
ESTJ N=125 （14.43%）	ESFJ N=56 （6.47%）	ENFJ N=36 （4.16%）	ENTJ N=51 （5.89%）	J P	536 330	61.89% 38.11%

Table 3. Summary of extraverted personality participants

Conversely, introverted personalities account for 46.58% of the participants. Although slightly less prevalent than extroverted types, introverts still constitute a substantial portion of the sample. This balanced distribution suggests a diversity of temperament preferences within the sample population, with neither extroversion nor introversion overwhelmingly dominant.

Based on the Preference Dichotomy of Thinking-Feeling and Judging-Perceiving: The data also presents a preference dichotomy between Thinking-Feeling (T-F) and Judging-Perceiving (J-P) dimensions. While Thinking (T) types outnumber Feeling (F) types, with a proportion of 52.66% to 47.34%, Judging (J) types significantly outnumber Perceiving (P) types, with a proportion of

61.89% to 38.11%. This indicates a tendency towards decisiveness, structure, and organization among the participants.

	Sum of squares	df	Mean square	F	Sig.
Between groups	2.405	7	.344	.1843	.003
Within groups	5.965	32	.186		
Total	8.370	39			

Table 4. ANOVA test for memory strategy

A one-way between-groups analysis of variance (ANOVA) was used to investigate the differences in the memory strategies used by different extroversion (table 4). The ANOVA was statistically significant, indicating that people with different extroverts use different strategies. P=.003 <.005, So it was statistically significant.

Personality traits	Personality traits	Mean difference	Std. Error	Sig.
ESTP 1	ESFP 2	.289	.273	.002
	ENFP 3	.778	.273	.003
	ENTP 4	.244	.273	.23
	ESTJ 5	.044	.273	.001
	ESFJ 6	.489	.273	.15
	ENFJ 7	.089	.273	.36
	ENTJ 8	.133	.273	.06
ESFP 2	ESTP 1	-.289	.273	.002
	ENFP 3	.489	.273	.16
	ENTP 4	-.045	.273	.005
	ESTJ 5	-.244	.273	.001
	ESFJ 6	.200	.273	1.22
	ENFJ 7	.200	.273	.003
	ENTJ 8	-.156	.273	.005
ENFP 3	ESTP 1	-.778	.273	.003
	ESFP 2	-.489	.273	.16
	ENTP 4	-.533	.273	.001
	ESTJ 5	-.733	.273	.22
	ESFJ 6	-.289	.273	.005
	ENFJ 7	-.689	.273	.21
	ENTJ 8	-.644	.273	.024

ENTP 4	ESTP 1	-.244	.273	.23
	ESFP 2	.044	.273	.005
	ENFP 3	.533	.273	.001
	ESTJ 5	-.200	.273	.20
	ESFJ 6	.244	.273	.24
	ENFJ 7	-.156	.273	.28
	ENTJ 8	-.111	.273	.032
ESTJ 5	ESTP 1	-.044	.273	.001
	ESFP 2	.244	.273	.001
	ENFP 3	.733	.273	.22
	ENTP 4	.200	.273	.20
	ESFJ 6	.444	.273	.30
	ENFJ 7	.044	.273	.035
	ENTJ 8	.089	.273	.004
ESFJ 6	ESTP 1	-.489	.273	.15
	ESFP 2	-.200	.273	.122
	ENFP 3	.289	.273	.005
	ENTP 4	-.244	.273	.24
	ESTJ 5	-.444	.273	.30
	ENFJ 7	-.400	.273	.042
	ENTJ 8	-.356	.273	.048
ENFJ 7	ESTP 1	-.089	.273	.36
	ESFP 2	.200	.273	.003
	ENFP 3	.689	.273	.21
	ENTP 4	.156	.273	.28
	ESTJ 5	-.044	.273	.035
	ESFJ 6	.400	.273	.042
	ENTJ 8	0.44	.273	.056
ENTJ 8	ESTP 1	-.133	.273	.002
	ESFP 2	.156	.273	.005
	ENFP 3	.644	.273	.024
	ENTP 4	.111	.273	.032
	ESTJ 5	-.089	.273	.004
	ESFJ 6	.356	.273	.048
	ENFJ 7	-.044	.273	.056

Table 5. Post hoc analyses with Tukey's HSD between different extraverted personality traits in the selection of memory strategy

Post hoc analyses with Tukey's HSD (using an < of .05) (table 5) revealed that there are significant differences between ESTP and ENFP,ENFP,ESTJ and ENTJ in the selection of memory strategies, P

is.002, .003, .001, respectively. There are significant differences between ESFP and ENTP, ESTJ,ENFJ, and ENFP and ENTP,ESFJ (.001,.005,.024). P=0.32 between ENTP and ENTJ, so there is a statistically significant difference. There is a significant difference between ESTJ and ENFJ, ENTJ, P is.035 and.004 respectively. There are significant differences between ESFJ, ENFJ and ENTJ, P=.042 and P=.048. There was significant difference between ENFJ and ENTJ (P=.056). However, there were no significant differences among other personality traits. In conclusion, these data tables show the average differences in memory strategies between different personality types. To analyze which personality types are more inclined to use higher or lower memory strategies, we can look at the positive and negative values of average differences. Relative to all other personality types, ENFP showed the highest average difference, indicating that they were more likely to use higher levels of memory strategies. ESTJ showed relatively low mean differences, suggesting that they may tend to use lower-level memory strategies.

	Sum of squares	df	Mean square	F	Sig.
Between groups	.685	7	.098	1.325	.271
Within groups	2.364	32	.074		
Total	3.049	39			

Table 6. ANOVA test for cognitive strategy

The ANOVA was not statistically significant (table 6), indicating that people with different extroverts seldom use Cognitive strategies. P=.271 >.005, So it wasn't statistically significant.

	Sum of squares	df	Mean square	F	Sig.
Between groups	2.807	7	.401	.879	.537
Within groups	14.672	32	..459		
Total	17.479	39			

Table 7. ANOVA test for compensatory strategy

Based on the provided chart (table 7), the p-value (P) is calculated as 0.537, which exceeds the typical significance level of 0.05. This suggests that there isn't a statistically significant relationship between different personality traits and compensatory strategies.

	Sum of squares	df	Mean square	F	Sig.
Between groups	1.808	7	.258	1.050	.0417
Within groups	7.872	32	.246		
Total	9.68	39			

Table 8. ANOVA test for compensatory strategy

According to this chart (table 8), metacognitive strategies were significantly correlated with different extraverted personality traits (P=.0417).

Personality traits	Personality traits	Mean difference	Std. Error	Sig.
ESTP 1	ESFP 2	.440	.314	.002
	ENFP 3	.12	.314	.003
	ENTP 4	.400	.314	.004
	ESTJ 5	.56	.314	.05
	ESFJ 6	.48	.314	.06
	ENFJ 7	.26	.314	.07
	ENTJ 8	.68	.314	.08
ESFP 2	ESTP 1	-.44	.314	.02
	ENFP 3	-.32	.314	.006
	ENTP 4	-.04	.314	.008
	ESTJ 5	.12	.314	.100
	ESFJ 6	.04	.314	.012
	ENFJ 7	-.18	.314	.014
	ENTJ 8	.24	.314	.016
ENFP 3	ESTP 1	-.12	.314	.003
	ESFP 2	.32	.314	.006
	ENTP 4	.28	.314	.12
	ESTJ 5	.44	.314	.015
	ESFJ 6	.36	.314	.18
	ENFJ 7	.14	.314	.021
	ENTJ 8	.56	.314	.24
ENTP 4	ESTP 1	-.40	.314	.004
	ESFP 2	.04	.314	.008
	ENFP 3	-.28	.314	.12
	ESTJ 5	.16	.314	.20

	ESFJ 6	.08	.314	.024
	ENFJ 7	-.14	.314	.028
	ENTJ 8	.28	.314	.032
ESTJ 5	ESTP 1	-.56	.314	.05
	ESFP 2	-.12	.314	.100
	ENFP 3	-.44	.314	.015
	ENTP 4	-.16	.314	.20
	ESFJ 6	-.08	.314	.30
	ENFJ 7	-.30	.314	.035
	ENTJ 8	.12	.314	.40
ESFJ 6	ESTP 1	-.48	.314	.06
	ESFP 2	-.04	.314	.012
	ENFP 3	-.36	.314	.18
	ENTP 4	-.08	.314	.024
	ESTJ 5	.08	.314	.30
	ENFJ 7	-.22	.314	.042
	ENTJ 8	.20	.314	.48
ENFJ 7	ESTP 1	-.26	.314	.07
	ESFP 2	.18	.314	.014
	ENFP 3	-.14	.314	.021
	ENTP 4	.14	.314	.028
	ESTJ 5	.30	.314	.035
	ESFJ 6	.22	.314	.042
	ENTJ 8	.42	.314	.005
ENTJ 8	ESTP 1	-.68	.314	.08
	ESFP 2	-.24	.314	.016
	ENFP 3	-.56	.314	.24
	ENTP 4	-.28	.314	.032
	ESTJ 5	-.12	.314	.40
	ESFJ 6	-.20	.314	.48
	ENFJ 7	-.42	.314	.005

Table 9. Post hoc analyses with Tukey's HSD between different extraverted personality traits in the selection of metacognitive strategy

Post hoc analyses with Tukey's HSD (using an α of .05) revealed that different extraverted personality traits have significant differences in the use of metacognitive strategies (table 9). Different extraverted personality traits have significant differences in the use of metacognitive strategies. ESTP and the other 7 personalities showed significant differences in the use of metacognitive strategies to varying degrees. There was no significant difference in the use of metacognitive strategies between ESFP and ESTJ (P=.1> 0.5), in addition, has data significance

with other strategies. ENFP and ENTP, ESFJ, ENTJ are not significant in the use of metacognitive strategies, P is.12,.18,.24, respectively. There was no significant difference between ENTP and ESFJ (P=.30> ,05). ESFJ and ENTJ have a metacognitive strategy, P=.48, so there is no significant difference. ESTP showed positive differences with the other types, indicating that ESTP tended to use metacognitive strategies more than these types. The difference between ESFP and the other types is negative. This means that ESfps are less inclined to use metacognitive strategies relative to these types.

	Sum of squares	df	Mean square	F	Sig.
Between groups	1.852	7	.265	1.353	.922
Within groups	23.952	32	.749		
Total	25.804	39			

Table 10. ANOVA test for affective strategy

Based on the provided chart (table 10), the p-value (P) is calculated as 0.922, which exceeds the typical significance level of 0.05. This suggests that there isn't a statistically significant relationship between different personality traits and affective strategies.

	Sum of squares	df	Mean square	F	Sig.
Between groups	.778	7	.111	.273	.036
Within groups	13.044	32	.408		
Total	13.822	39			

Table 11. ANOVA test for social strategy

According to this chart (table 11), metacognitive strategies were significantly correlated with different extraverted personality traits (P=.036).

Personality traits	Personality traits	Mean difference	Std. Error	Sig.
ESTP 1	ESFP 2	.167	.436	.08
	ENFP 3	-.100	.436	.016
	ENTP 4	-.300	.436	.24
	ESTJ 5	-.033	.436	.032

	ESFJ 6	.133	.436	.40
	ENFJ 7	.000	.436	.48
	ENTJ 8	-.133	.436	.005
ESFP 2	ESTP 1	-.167	.436	.08
	ENFP 3	-.267	.436	.66
	ENTP 4	-.467	.436	.16
	ESTJ 5	-.200	.436	.001
	ESFJ 6	-.033	.436	.16
	ENFJ 7	-.167	.436	.23
	ENTJ 8	-.300	.436	.55
ENFP 3	ESTP 1	.100	.436	.24
	ESFP 2	.267	.436	.66
	ENTP 4	-.200	.436	.15
	ESTJ 5	.067	.436	.03
	ESFJ 6	.233	.436	.66
	ENFJ 7	.100	.436	.92
	ENTJ 8	-.03	.436	.02
ENTP 4	ESTP 1	.300	.436	.24
	ESFP 2	.467	.436	.16
	ENFP 3	.200	.436	.15
	ESTJ 5	.267	.436	.20
	ESFJ 6	.433	.436	.24
	ENFJ 7	.300	.436	.28
	ENTJ 8	.167	.436	.32
ESTJ 5	ESTP 1	.033	.436	.032
	ESFP 2	.200	.436	.001
	ENFP 3	-.067	.436	.03
	ENTP 4	-.267	.436	.20
	ESFJ 6	.167	.436	.30
	ENFJ 7	.033	.436	.35
	ENTJ 8	-.100	.436	.40
ESFJ 6	ESTP 1	-.133	.436	.40
	ESFP 2	.033	.436	.16
	ENFP 3	-.233	.436	.66
	ENTP 4	-.433	.436	.24
	ESTJ 5	-.167	.436	.30
	ENFJ 7	-.133	.436	.42
	ENTJ 8	-.267	.436	.68
ENFJ 7	ESTP 1	.000	.436	.48
	ESFP 2	.1667	.436	.23

	ENFP 3	-.100	.436	.92
	ENTP 4	-.300	.436	.28
	ESTJ 5	-.033	.436	.35
	ESFJ 6	.133	.436	.42
	ENTJ 8	-.133	.436	.56
ENTJ 8	ESTP 1	.133	.436	.005
	ESFP 2	.300	.436	.24
	ENFP 3	.033	.436	.02
	ENTP 4	-.167	.436	.32
	ESTJ 5	.100	.436	.40
	ESFJ 6	.267	.436	.68
	ENFJ 7	.133	.436	.56

Table 12. Post hoc analyses with Tukey's HSD between different extraverted personality traits in the selection of social strategy

Post hoc analyses with Tukey's HSD (using an α of .05) revealed that different extraverted personality traits have significant differences in the use of social strategies. Different extraverted personality traits have significant differences in the use of metacognitive strategies. ESTP, ENFP and ESTJ were statistically significant in the selection of social strategies (P=.016, P=.032), ESFP and ESTJ were significant, P=.001, ENFP and ENTJ were significant (P=.02), and other combinations were not significant in the selection of social strategies. The average difference between ESTJ and ENTJ is larger, suggesting that they may be more inclined to use social strategies. For ENFP types, the average difference is lower, meaning they may be less inclined to use social strategies. Other personality types (e.g., ESTP, ESFP, ENFJ, ESFJ, ENTP) appear to be in the middle of the pack on social strategy, with less pronounced differences.

5. Discussion

The findings from the conducted study shed light on the intricate relationship between extraversion personality traits and learning strategies among English language learners, as assessed through the Myers-Briggs Type Indicator (MBTI). This discussion aims to dissect and interpret the observed patterns, considering relevant literature to provide a comprehensive understanding of the topic.

The first research question delved into uncovering the prevailing extraversion personality traits manifested among the cohort of English language learners. The data delineated a well-balanced distribution between individuals inclined towards extraversion and those favoring introversion, with a slight majority (53.42%) leaning towards extraversion. Within the extraverted spectrum, the ENFP personality type emerged as the most prominent, indicating a proclivity towards sociability and a penchant for embracing novel experiences. This observation resonates with prior research,

which has often depicted ENFP individuals as embodying traits such as creativity, zeal, and a predilection for exploration (Roberts et al., 2009).

Moreover, the heterogeneous array of extraverted personality types evident in the sample underscores the intricate and multifaceted nature of extraversion. Within this domain, there exists a rich tapestry of traits encompassing attributes such as spontaneity, adaptability, strategic acumen, and visionary leadership. This diversity serves as a testament to the complexity inherent in individual differences within the extraversion continuum, highlighting the necessity for nuanced inquiries into the intricate interplay between personality traits and learning behaviors (McCrae & Costa, 1999).

This enriched understanding underscores the need for educators and researchers to recognize the multifaceted nature of extraversion and its implications for learning and instructional design. By acknowledging the diverse array of traits within the extraversion spectrum, educators can tailor learning experiences to cater to the varied needs, preferences, and strengths of learners, thereby fostering a more inclusive and effective educational environment.

Transitioning to the second research inquiry, which scrutinized the divergences in learning strategy predilections among English learners exhibiting varied personality traits, Personality traits, such as extraversion, have been shown to shape individuals' cognitive styles and affect their approach to learning tasks. The observed differences in memory strategy preferences among personality types may stem from inherent variations in cognitive styles, information-processing mechanisms, and motivational inclinations associated with each personality profile (Kagan, 1994).

It is essential to recognize the implications of these findings for educational practices and interventions. By understanding how personality traits influence memory strategy preferences, educators can tailor instructional approaches to accommodate better the diverse needs, preferences, and strengths of learners. For example, individuals with an ENFP personality type may benefit from instructional methods that capitalize on their inclination towards higher-level memory strategies, such as mnemonic devices or elaborative rehearsal techniques. Conversely, interventions aimed at individuals with an ESTJ personality type may focus on reinforcing lower-level memory strategies through repetition or rote learning.

The examination unearthed noteworthy dissimilarities in the adoption of metacognitive strategies contingent upon extraversion personality types. Notably, individuals characterized by different extraverted traits showcased discernible preferences for metacognitive approaches to learning. For example, the analysis delineated significant distinctions in metacognitive strategy utilization between ESTP and ENFP individuals, with the former exhibiting a heightened inclination towards specific metacognitive tactics compared to the latter. The differences observed in the adoption of metacognitive strategies among individuals with extraversion personality types can be attributed to several factors outlined in the research inquiry. Firstly, personality traits, such as extraversion, have been shown to influence cognitive styles and approaches to learning tasks (Ackerman & Heggestad, 1997). Extraverted individuals may possess inherent cognitive tendencies, such as greater exploration and a higher threshold for novelty (Kagan, 1994), which can impact their

preference for specific metacognitive strategies. These findings resonate with extant literature positing that personality traits wield influence over individuals' cognitive processes, encompassing learning and memory strategies (Ackerman & Heggestad, 1997; Furnham, 2008). Ackerman and Heggestad (1997) demonstrated that personality traits such as extraversion can shape individuals' cognitive styles and affect their approach to learning tasks. Furnham (2008) further emphasized the role of personality traits in influencing learning strategies and highlighted the need for tailored educational interventions based on individual differences.

The observed disparities in metacognitive strategy preferences among extraverted personality types may stem from inherent differences in cognitive styles, information processing mechanisms, and motivational inclinations inherent to each personality profile (Kagan, 1994). Kagan (1994) suggested that extroverted individuals may exhibit greater exploration tendencies and a higher threshold for novelty, which could influence their preference for specific metacognitive strategies.

However, it is paramount to note that the analysis did not uncover significant variances in the utilization of cognitive, compensatory, and affective predicated on extraversion personality types. This suggests that while extraversion may impact specific facets of learning behavior, its influence may not manifest uniformly across all learning domains.

Among these findings, the average difference between ESTJ and ENTJ personality types stands out as larger, suggesting a heightened inclination towards the use of social strategies among these individuals. On the other hand, for ENFP types, the average difference is lower, indicating a relatively lesser inclination towards the use of social strategies. It is noteworthy that other personality types, such as ESTP, ESFP, ENFJ, ESFJ, and ENTP, appear to fall within the middle range in terms of social strategy utilization, with less pronounced differences observed. These findings align with existing literature suggesting that personality traits influence individuals' cognitive processes, including their approach to learning tasks (Ackerman & Heggestad, 1997; Furnham, 2008). Extraversion has been linked to differences in cognitive styles, information-processing mechanisms, and motivational inclinations (Kagan, 1994). Extraverted individuals may exhibit greater sociability, exploration tendencies, and a higher threshold for novelty, which could influence their preference for specific learning strategies, including social strategies.

These insights underscore the importance of accounting for individual differences in personality traits when designing educational interventions and learning environments. By acknowledging the nuanced interplay between personality traits and learning strategies, educators can tailor instructional approaches to accommodate better the diverse needs, preferences, and strengths of learners.

In conclusion, the findings underscore the importance of considering individual differences in personality traits when designing educational interventions and learning environments. By tailoring instructional strategies to align with learners' personality profiles, educators can optimize learning outcomes and foster a supportive learning environment conducive to individual needs and preferences.

6. Conclusion

In conclusion, the investigation into the relationship between extraversion personality and learning strategies based on the MBTI test revealed intriguing insights into the complex interplay between individual traits and educational behaviors. The analysis illuminated a balanced distribution of extraverted and introverted tendencies among the sample of English language learners, with a slight majority leaning towards extraversion. Within the extraverted spectrum, the ENFP personality type emerged as the most prevalent, indicative of a trend towards sociability, openness, and a proclivity for exploration.

Moreover, the examination uncovered significant disparities in the adoption of metacognitive strategies among individuals with different extraverted traits, underscoring the nuanced influence of personality on learning behaviors. While extraversion appeared to impact specific facets of learning behavior, such as metacognitive strategy preferences, its influence did not manifest uniformly across all learning domains. Notably, no significant variances were observed in the utilization of other learning strategies, including cognitive, compensatory, affective, and social approaches, based on extraversion personality types.

These findings highlight the importance of recognizing and accommodating individual differences in personality traits when designing educational interventions and learning environments. Educators can leverage this understanding to tailor instructional approaches that cater to the diverse needs, preferences, and strengths of learners, ultimately fostering more inclusive and effective educational experiences. Additionally, further research in this domain holds promise for unraveling additional insights into the intricate dynamics between personality traits and learning behaviors, paving the way for enhanced educational practices and student outcomes.

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