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Exploring the Dynamic Connections Between Personality Traits, Depression, and Life Quality in Chinese College and Graduate Students: Insights from the Myers-Briggs Type Indicator

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Abstract: This study delves into the intricate interplay between depression and life quality among Chinese college and graduate students, employing the Myers-Briggs Type Indicator (MBTI) to assess personality traits. The hypothesis posits that the MBTI's classification of 16 personality types, organized across four dichotomies, plays a pivotal role in shaping the mental health and daily experiences of individuals. Data from 30 participants were collected through an online survey, encompassing MBTI types, life quality measured by the modified Life Event Scale (LES), and depression levels assessed by the Self-Rating Depression Scale (SDS). Statistical analyses, including Pearson correlation and mediation models, were employed to investigate the relationships between MBTI dimensions, specifically focusing on the Extroversion/Introversion dimension, and their impact on depression, with life quality acting as a mediating variable. The study's outcomes revealed no direct correlation between MBTI dimensions and depression. However, a noteworthy partial mediating effect of life quality emerged in the context of the association between Extroversion/Introversion and depression. The research underscores the importance of considering individual personality characteristics when evaluating mental health and life satisfaction. Furthermore, it suggests that life quality may serve as a mediating factor in the manifestation of depressive symptoms based on personality type. While acknowledging limitations such as a restricted sample size and a narrow social experience measure, the findings advance our understanding of the intricate relationship between personality and mental health. They also underscore the need for further research involving diverse populations to enrich the breadth of our insights.

Keywords: Myers-Briggs Type Indicator, personality traits, depression, life quality, mediation

1. Introduction

The interplay among human's personality, emotional well-Bing and overall quality of life is intricate. In the current society, one of the most popular personality assessment tools is the Myers-Briggs Type Indicator (MBTI). MBTI emerges as a vibrant, widely-used tool, offering individuals with a more comprehensive understanding of their individual personalities, encompassing traits such as preferences for careers, compatibility with others, strengths, limitations, and likes and dislikes [1].

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By assessing people on eight distinct personality traits, grouped into four dichotomies - introvert (I) or extrovert (E); sensing (S) or intuition (N); thinking (T) or feeling (F); and judging (J) or perception (P) – and aligning them into 16 unique personality types, the MBTI can help explain how people approach different aspects of their lives [2]. For instance, the person, whose MBTI is INTJ, are more inclined towards introversion, intuition, thinking, and judging. Individuals with these personalities are usually creative, independent, and good listeners. They tend to have strong values and enjoy exploring new ideas. These classifications provide a framework for comprehending individuals' inclinations towards behavior, methods of decision-making, and even their social interactions with others.

However, despite the fact that personality type analysis provides valuable insights into an individual's intrinsic nature, it is critical to acknowledge the rising incidence of mental health problems in modern society. The prevalence and impact of depression have been a subject of significant concern in the field of mental health. Based on the results of two nationally representative surveys of U.S. adolescents, the rates of adolescents' depressive symptoms, suicide-related outcomes, and suicide rates increased between 2010 and 2015 [3]. Research have shown that one's personality traits could influence an individual's susceptibility to mental health like depression and their overall quality of life since personality traits serve as a means to depict the variations among individuals that exist within a relatively consistent framework of thoughts, emotions, and actions [4]. These results provided by the research emphasize the urgent necessity to further investigate the possible associations between an individual's innate personality characteristics and their susceptibility to mental health difficulties.

Given the unique behavioral and emotional profiles associated with each MBTI type, it stands to reason that individuals might experience depression and navigate life in ways specific to their personality category. This intricate connection forms the cornerstone of our present study. In light of these close relations, the current study endeavors to explore the individual's experience of depression based on their distinctive personality categories generated by their MBTI-test report. It also aims to study how and why individual of different MBTI types exhibit varying quality of life.

2. Method

2.1. Participants

Students at the college and graduate levels were recruited through social media platforms. These participants were requested to complete a survey consisting of 38 questions, which was administered using an online survey tool known as "Wenjuanxing." Specific details will be provided in the following sections. Initially, the survey was completed by a group of 31 individuals. However, one participant was excluded due to an excessively long completion time. Consequently, the final cohort comprised 30 individuals with an age range of 18 to 26 years (mean = 20.9, standard deviation = 2.2), including 13 (43.3%) females. All of these participants were Mandarin speakers, residing in either China (n=6) or the United States (n=24).

2.2. Study Design

Participants were required to fill out a comprehensive 38-question survey, encompassing three distinct sections: 1) demographic information (i.e., age, gender) and the MBTI personality type, 2) a life quality questionnaire, and 3) a questionnaire evaluating depression level. All questions were delivered in Mandarin. It was explicitly communicated to participants that they should determine their MBTI personality type before finishing the survey (Extraversion [E; n=15] vs. Introversion [I; n=15]; Intuitive [N; n=25] vs. Sensing [S; n=5]; Feeling [F; n=24] vs. Thinking [T; n=6]; Judging [J; n=13] vs. Perceiving [P; n=17]), as MBTI type was a self-reported, not questionnaire, aspect of the study.

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Only age and gender were gathered since none of the other demographic data was of interest. It was understood that all participants shared a common Asian, specifically Chinese, racial background, given that the survey was distributed via a Chinese social media platform.

Life quality was evaluated using a modified Life Event Scale (LES; Appendix A) derived from the Social Readjustment Rating Scale (SRRS), originally formulated by Holmes and Rahe [5], and later adapted by Yang and Zhang to focus on specific life events and pressures in China [6]. The original LES encompassed a total of 48 items, including 28 related to family and life, 13 concerning education and school, and 7 revolving around social events. Respondents were required to provide information about the timing, emotional significance, extent, and duration of these events. Given that our study concentrated on Chinese young college and graduate students, certain items like marriage, divorce, pregnancy, and retirement were not relevant to our target cohort. Consequently, we refined the scale, reducing the number of items from 48 to 15 categories, including 8 related to family, 5 associated with education, and 2 asking about social events. Participants were asked to express their satisfaction with each item using a five-point Likert scale: -2 = very dissatisfied, -1 = dissatisfied, 0 = neutral, 1 = satisfied, 2 = very satisfied. Scores ranged from -30 to 30, with higher LES scores indicating greater life satisfaction.

To assess depression levels, the Self-Rating Depression Scale (SDS) was employed [7]. The SDS comprised 20 items, each requiring responses on a four-point Likert scale. For each item, participants indicated whether they agreed with the statement a) a little of the time, b) some of the time, c) a good part of the time, or d) most of the time. Of these items, ten were positively worded, while the remaining ten were worded negatively. Scoring for the negative items was as follows: 1 = a), 2 = b), 3 = c), and 4 = d). In contrast, the positive items were scored inversely: 4 = a), 3 = b), 2 = c), and 1 = d). The total score was computed by summing responses to all items, resulting in a range of scores from 20 to 80. A score below 50 fell within the "normal range," while scores between 50 and 59 indicated "minimal to mild depression." Scores between 60 and 69 signified "moderate to severe depression," and scores exceeding 70 represented "severe depression."

2.3. Statistical Analysis

A series of analysis was conducted to investigate the relationship among various variables using R (*base* and *lavaan* package). Pearson correlation analyses were performed to assess the connections between age, overall life quality, social quality, education quality, family quality, and depression. Additionally, two-sample t-tests were conducted to compare overall life quality and depression scores across different MBTI categories and gender. To address multiple comparisons, all correlation tests and two-sample t-tests were subjected to Bonferroni-Holm corrections.

Our primary hypothesis revolved around the notion that Extroverts might exhibit lower levels of depression compared to Introverts due to their generally higher life quality. To explore this hypothesis, we employed a mediation model in which an individual's E/I categorization served as the predictor variable, depression as the outcome variable, and overall life quality score as the mediator. To delve further into the specific contributions of distinct life quality categories (i.e., social, family, education), we executed a parallel mediation model with social, family, and education as separate mediators. Model parameters were estimated with *lavaan*'s boostrapped (10000 iterations) approach, and all effects were standardized.

In addition to the main hypothesis-driven mediation analysis, we would explore other mediation models if an MBTI dimension's impact on life quality and depression proved to be significant with two-sample t-tests.

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3. Result

3.1. Relationship between life quality and depression

Pearson's correlation analyses were conducted to investigate the relationship between age, various aspects of life quality, and depression level. The results are shown in Table 1 below.

Table 1: Pearson Correlation between Age, Life Quality and Depression.

	Age	Life Quality	Family	Education	Social	Depression
Age						
Life Quality	-0.08					
Family	-0.24	0.91***				
Education	0.31	0.75***	0.47			
Social	-0.18	0.70***	0.51*	0.42		
Depression	-0.11	-0.51*	-0.42	-0.54*	-0.23	
Mean	20.9	12.67	7.53	4.43	0.70	38.9
S.D.	2.20	8.21	5.14	2.91	1.91	7.89

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$, Bonferroni-Holm corrected

Age did not exhibit any significant correlations with overall life quality, social quality, family quality, or depression level ($p > 0.5$). As expected, life quality and its subcategories demonstrated highly positive correlations with one another ($p < 0.01$). However, among the three subcategories, only family quality and social quality displayed a significant positive association ($r(28) = 0.51$, $p = 0.04$). Depression level showed a significant negative correlation with overall life quality ($r(28) = -0.51$, $p = 0.041$) and education quality ($r(28) = -0.51$, $p = 0.023$). Notably, the association between depression level and family quality ($r(28) = -0.42$, $p = 0.079$) and social quality ($r(28) = -0.23$, $p > 0.99$) was not significant. Therefore, the primary influence on depression level, stemming from overall life quality, likely derives from education quality. This suggests that as education quality improves, participants tend to experience reduced levels of depression.

3.2. Influence of MBTI on life quality and depression

Table 2 displays the summary statistics grouped by gender and subcategories of life quality. Two-sample t-tests indicated a significant difference in social quality ($t(28) = -3.48$, $p = 0.018$) when comparing Extroverts to Introverts. More specifically, Extroverts (M=1.7, SD=1.7) were more satisfied with their social quality than Introverts (M=-0.3, SD=1.6). However, none of the other MBTI dimensions or gender exhibited any impact on life quality measures or depression levels after multiple comparison corrections.

Table 2: Summary Statistics of Life Quality and Depress.

	Life Quality	Family	Education	Social	Depression
Female	12.5 (7.8)	7.6 (5.0)	4.3 (2.6)	0.5 (1.3)	40.6 (9.4)
Male	12.8 (8.7)	7.5 (5.4)	4.5 (3.2)	0.8 (2.3)	37.6 (6.6)
E	16.1 (9.43)	9.1 (6.3)	5.3 (2.9)	**1.7 (1.7)**	36.8 (6.0)
I	9.3 (5.1)	6.0 (3.2)	3.6 (2.7)	**-0.3 (1.6)**	41.0 (9.1)
N	12.5 (7.8)	7.2 (5.1)	4.6 (2.7)	0.7 (1.9)	39.1 (8.2)
S	13.4 (11.1)	9.0 (6.0)	3.6 (4.0)	0.8 (2.3)	38.0 (6.7)
F	12.8 (9.0)	7.8 (5.7)	4.3 (2.9)	0.8 (2.1)	39.4 (8.6)

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Table 2: (continued).

T	12.0 (4.7)	6.7 (1.9)	5.0 (3.2)	0.3 (1.2)	36.8 (4.2)
J	13.2 (7.2)	7.6 (4.3)	5.2 (2.8)	0.3 (1.7)	37.1 (7.4)
P	12.3 (9.1)	7.5 (5.8)	3.8 (2.9)	1.0 (2.1)	40.3 (8.2)

Notes: The values in the table are mean (standard deviation). Bolded summary statistics are significant after Bonferroni-Holm correction.

3.3. Mediation effect of life quality on depression

Figure 1 illustrates the mediation model, examining whether the influence of Extrovert/Introvert personality traits on depression is mediated by overall life quality. The findings revealed the significance of direct effects: Extrovert/Introvert on life quality (B = -0.42, p = 0.014; bootstrapped CI = [-12.05, -1.15]) and life quality on depression (B = -0.48, p = 0.001; bootstrapped CI = [-0.79, -0.22]). Importantly, the indirect effect of Extrovert/Introvert on depression was also found to be significant (B = 0.2; bootstrapped CI = [0.93, 7.23]). However, the total effects (B = 0.27; bootstrapped CI = [-1.25, 9.62]) and the direct impact of Extrovert/Introvert on depression (B = 0.07, p = 0.696; bootstrapped CI = [-4.293, 6.382]) were not statistically significant. Therefore, this analysis demonstrated a partial mediation effect of Extrovert/Introvert personality traits on depression through overall life quality.

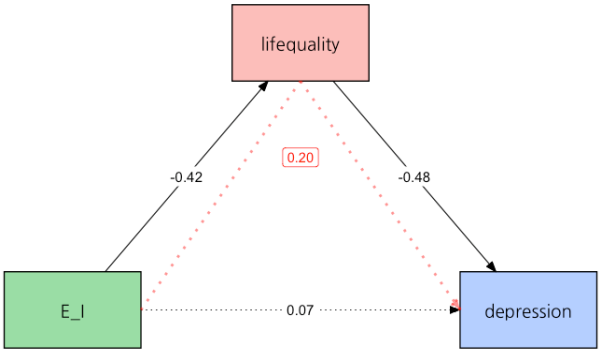

Figure 1: Mediation model. Extrovert/Introvert effect on depression mediated by overall life quality.

Notes: Black lines and arrows indicate the direction of the direct effect (solid = significant, dotted = non-significant). Red dotted line and arrow indicate the significant indirect effect of Extrovert/Introvert on depression through life quality. Values on each arrow indicate the amount of standardized effect.

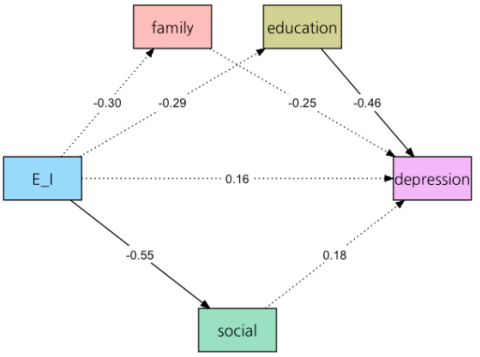

Figure 2: Parallel Mediation Model. Extrovert/Introvert's effect on depression mediated by family, education, and social quality.

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Notes: Arrows indicate the direction of effect (solid = significant, dotted = non-significant). Values on each arrow indicate the amount of standardized effect.

Figure 2 shows a parallel mediation model, where we tested whether the Extrovert/Introvert's effect on depression was mediated by family, education, or social quality of life. Results only indicated a direct effect of Extrovert/Introvert personality on social quality (B = -0.42, p = 0.014; bootstrapped CI = [-12.05, -1.15]) and a direct effect of education quality on depression (B = -0.42, p = 0.014; bootstrapped CI = [-12.05, -1.15]), consistent with the two-sample t-test and Pearson's correlation respectively. None of the other direct, indirect, or total effects were significant.

4. Discussion

Understanding an individual's mental wellbeing and life-quality often involves delving into their personality features as well. The Myers-Briggs Type Indicator (MBTI) categorizes people into sixteen distinct personality types to help understand these qualities. Using online questionnaires, this study investigated the impact of various personality characteristics on depression and quality of life among college and graduate students.

The results underscored the tight connection between individuals' family dynamic and their social lives. It is widely acknowledged that the influence of one's family on their social interactions is enduring and profound. As highlighted by Thomas, Liu, and Umberson [8], "parents, grandparents, and children often provide care for each other at different points in the life course, which can contribute to social support, stress, and social control mechanisms". These elements play a pivotal role in shaping the health and well-being of each family member over the course of their lives. Indeed, family plays a crucial role in shaping individuals' early socialization, offering emotional support and fostering a sense of belonging. The concept of strong family ties goes beyond mere emotional bonds; it becomes instrumental in enhancing the development of social skills, instilling values, and shaping norms. These, in turn, have a profound impact on how individuals navigate and interact within the broader social environment [9].

The findings further confirmed the well-established link between social experience and Extroversion/Introversion MBTI dimension, with Extroverts consistently expressing higher social satisfaction than Introverts [10]. This aligns with prior research suggesting that individuals with greater extroversion tend to build stronger social connections and engage more readily in social activities. As Kendra Cherry stated in her article "5 Extrovert Personality Traits" [1], extroverts energize through social connection. Their natural social confidence makes them comfortable navigating social settings and forging effortless connections. These factors, in turn, have been linked to higher life satisfaction and potentially contribute to reduced depressive symptoms [11].

Unexpectedly, no direct correlation was observed between any MBTI dimensions and depression, particularly not the Extroversion/Introversion dimension. While this initial analysis appeared to suggest no link between personality and depression, a more profound understanding emerged through the mediation analysis, which demonstrated that the relationship between Extroversion/Introversion and depression is partially mediated by overall life quality. This finding unveils a more intricate connection: even though personality demonstrably affects life quality, its influence on depression is not straightforward. Rather, it's partially influenced by an individual's subjective assessment of their overall well-being [4].

5. Limitation

The study's limitations must be acknowledged. Firstly, the small sample size, while statistically appropriate for inference, and the specific demographic of Chinese college and graduate students may limit the generalizability of the results to other populations, particularly those with more diverse

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backgrounds. Secondly, relying on self-reported MBTI types instead of in-survey tests saves time but also introduces a potential temporal bias. Individuals' personalities can evolve over time, and past assessments might not accurately reflect their current state. Additionally, the sole measurement of social life quality via two questions seems insufficient. Social experiences encompass various factors, ranging from interaction frequency and intimacy to perceived support and satisfaction. Limiting the assessment to a handful of questions potentially overlooks other meaningful aspects. Despite these limitations, it's noteworthy that significant differences in social satisfaction were still observed, even with self-reported MBTI and a narrow measure of social quality. This finding suggests a certain degree of robustness, hinting at a potentially important link between personality traits and one facet of social well-being, even if the full picture remains partially obscured.

6. Conclusion

In conclusion, the MBTI provides a valuable conceptual framework for understanding the relationship between personality traits, depression, and life quality. Broadly speaking, the findings presented herein collectively suggest that personality traits may not directly impact the likelihood of experiencing depression symptoms; instead, their influence manifests through the lens of life quality. Expanding the investigation to encompass broader facets of social well-being beyond simple satisfaction would be crucial. Investigating how personality traits influence individuals' perceived satisfaction with other various aspects of life, such as work, leisure, and personal growth, could shed more light on the intricate mechanisms underlying personality's indirect influence on depression.

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Appendix A. Life Events Scale. (Translated from Mandarin to English)

	Very dissatisfied	Dissatisfied	Neutral	Satisfied	Very satisfied
Family and life					
1. Love experience/happiness					
2. Sexual satisfaction					
3. Relationship between you and parents					
4. Parental affection					
5. Family/personal financial status					
6. Family/partner/friend physical condition					
7. Housing satisfaction					
8. Degree of stability in life					
Education and school					
9. Satisfaction with recent exams					
10. Satisfaction with learning environment					
11. Ability to relieve learning pressure					
12. Relationship with Professor/Teacher					
13. Relationships with classmates/friends					
Social Events					
14. Social satisfaction					
15. The impact of accidents					