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A Study on the Psychological Network of Wellbeing in Japanese Language Learners Based on the PERMA Model: A Psycholinguistic Perspective

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ABSTRACT

This study examines the study of the Japanese language in China. It employed a psycholinguistic approach, utilising the theoretical framework of PERMA. The study participants (N = 226) were all Japanese majors aged 18 to 22 years from three universities in Central China. The learners also completed a modified PERMA Profiler and a Negative Emotion subscale, which consider both positive and negative aspects of a person's state concerning psychological functions. The descriptive results indicated that the overall well-being of the students was in the upper-middle range. Among the five PERMA dimensions, Meaning scored the highest among the PERMA dimensions, suggesting students' well-being is drawn more significantly from the perceived purpose and value of their study, rather than from immediate affective experiences or task-based achievements.followed by Relationships and Positive Emotion. In contrast, Engagement and Accomplishment were weaker, suggesting challenges in sustaining focus and achieving learning goals. Scores for Negative Emotion were relatively high overall and displayed high variance, indicating individual differences in emotional regulation. Network analysis revealed that Positive Emotion functioned as the central node, linking strongly with Meaning, Engagement, and Accomplishment. Engagement and Accomplishment formed a tightly coupled pair, while Meaning acted as a bridge supported by Relationships. Negative Emotion remained peripheral, with weak or negative connections, particularly to Positive Emotion. Comparisons between high- and low-progress groups revealed broadly stable global structures; however, low-progress learners exhibited stronger negative links, indicating greater emotional vulnerability. These results extend the application of Positive Psychology to second language acquisition

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ARTICLE INFO
Received: 10 September 2025 | Revised: 14 September 2025 | Accepted: 17 October 2025 | Published Online: 12 November 2025
DOI: https://doi.org/10.30564/fls.v7i12.12031

CITATION
Wei, F., 2025. A Study on the Psychological Network of Wellbeing in Japanese Language Learners Based on the PERMA Model: A Psycholinguistic Perspective. Forum for Linguistic Studies. 7(12): 790–804. DOI: https://doi.org/10.30564/fls.v7i12.12031

and provide useful information for enhancing Japanese language instruction. Building resilience and achievement, and offering students in emotional distress specific attention, may help improve the overall well-being of learners.
Keywords: Japanese Language Learning; PERMA Model; Well-Being; Psychological Network Analysis; Psycholinguistics; Learner Emotions; Second Language Acquisition

1. Introduction

In recent years, the integration of learners' psychological well-being into second language education has attracted increasing scholarly and institutional attention. The Ministry of Education in China has emphasized the importance of embedding mental health and positive psychological interventions into classroom practices, highlighting well-being as a vital element of sustainable academic development. Within this context, the study of well-being among foreign language learners—particularly those specializing in Japanese—has become a pressing academic and pedagogical issue.

Well-being in learning generally refers to the experience of positive emotions, engagement, supportive relationships, meaning, and accomplishment during the learning process [1]. An expanding amount of literature shows that well-being is positively related to learning motivation, emotional regulation, resilience, and achievement when at a high level [2]. On the other hand, ill-being is commonly associated with increased anxiety, lack of engagement, and poor academic achievement, which may result in problems of persistence and even dropout in learning [3].

Although Positive Psychology has become popular in the field of applied linguistics and the concept of Positive Language Education has emerged [4], there is a tendency to concentrate on English learners and use correlational or regression-based research methods. The language learners of Japanese in China, however, face different challenges, such as shorter classes, changes in the curriculum, and unpredictable career opportunities. These aspects tend to increase negative feelings, weaker involvement, and worse performance, which is why they provide a special context for researching the well-being of learners. However, there is very little systematic research in this sphere [5].

The five components of the PERMA model of well-being are Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment [6], and this scheme offers a universal way to assess flourishing in education. Remarkably, it is important to note that its expansion to include negative feelings allows an individual to adopt a balanced standpoint regarding both protective and risk factors in the psychological systems of learners [7]. Even though the applicability of PERMA has already been demonstrated in language learning, the structural relationships between the dimensions and the potentially disruptive effect of negative emotions have not been explicitly studied.

Psychological network analysis is a strong methodological innovation to fill this gap. In contrast to the traditional methods that assume the variables are isolated predictors and outcomes, network analysis bases its conceptualization of well-being on an integrated system, with each dimension having a dynamic relationship with the others. This approach will reveal the hidden structure of learners' psychological states and identify where learning interventions can take action by pinpointing their central and bridging nodes.

In this paper, a psychological network is employed to assess the welfare of Japanese language learners in China from a psycholinguistic perspective. Specifically, the following questions may be answered: (1) to what degree the well-being and negative emotions of Japanese language learners are addressed; (2) how the network of the PERMA framework and its connection to negative emotions are to be arranged; (3) how the structure of the network may differ among the groups of learners who can be regarded as having different progress in learning. This way, the study will not only entail theoretical information about the psycholinguistics of well-being, but also provide practical recommendations on how Japanese language teaching to the Chinese population can be optimized.

1.1. Background of the Study

The articulation between psychological well-being and academic success has gained increasing significance in research in the field of higher education. In the last twenty years, theorists have come to acknowledge that cognitive

abilities and language proficiency are no longer sufficient to determine success in acquiring a second language (SLA). Rather, the emotional state, motivation, and psychological well-being of learners have a large impact on their persistence and their performance results. According to the model by Martin Seligman [6], the concept of well-being evaluation can be assessed using five positive dimensions, which include Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment, and also takes into account the effects of negative emotions like stress and anxiety [8].

The research finds itself at the crossroads of positive psychology and applied linguistics with the aim of focusing on Japanese language majors in China, which have received a comparatively small amount of empirical research. Though the study of English language learning in the context of Chinese higher education has been widely discussed, Japanese majors present a different group of challenges: short instructional time, the relatively lower interest in learning Japanese compared to English, and less possibility to enjoy authentic exposure. The factors establish a learning environment whereby both positive and negative psychological experiences are important factors in determining the outcomes of educational activities.

1.2. Importance of Well-being in Language Learning

The concept of learner well-being extends beyond temporary satisfaction or classroom enjoyment. It involves long-term involvement, the capacity to persevere despite difficulties, and the capacity to extract personal sense out of the study of language. Surveys in the field of positive psychology in SLA [9] note that positive emotional states are sources of motivation, their attention is broader, and they make learning deeper. As an example, when students feel positive emotion in a classroom, e.g., joy or curiosity, they may succeed even in hard grammar exercises or learning new vocabulary.

On the contrary, unfavourable feelings like anxiety about foreign languages [10] have the ability to decrease the working memory capacity, decrease classroom attendance, and decrease the achievement scores. A learner with chronic anxiety during oral communication activities can end up avoiding speaking activities, and this hinders the progress of fluency. Therefore, it is of great importance to understand the interaction of positive and negative experiences to build positive environments that can promote linguistic competence and the flourishing of the human psyche.

1.3. The PERMA Model as A Framework

The PERMA model proposed by Seligman [6] has been extensively used in research and education due to the fact that it summarizes various aspects of human prosperity. In the context of language learning:

Positive Emotion (P): Enhanced pleasure, gratification, and optimism in learning a language.

Engagement (E): A deep sense of involvement and flow in classroom tasks or independent study.

Relationships (R): The social network with peers and teachers, which is encouraging and supportive.

Meaning (M): The feeling that studying the language will help to grow personally, culturally belonging or professionally.

Accomplishment (A): A sense of success, mastery, and progress in accomplishing learning objectives.

The inclusion of Negative Emotion (N) as a complementary construct will provide the framework with a protective factor and a risk factor in the event of the study. This is essential, especially in SLA, where anxiety, frustration, and stress are frequent experiences that may either negate or accompany the positive elements of learning [11].

1.4. Relevance to Japanese Language Learners in China

Although literature in learner well-being has mostly centred around English language learning, Japanese majors in China are under different circumstances that can influence their psychological profiles. To begin with, Japanese programs do not necessarily spend as many hours on instruction as English does, which contributes to increased pressure to reach proficiency in a limited time. Second, the possibility of genuine immersion, including a study abroad or communication with native speakers, is also comparatively limited and poses a further challenge to the capacity of learners to remain driven. Third, the diversity of student motivation to major in Japanese (cultural interest, career goal, or personal preference) leads to a range of experienc-

es of meaning and accomplishment [12].

Simultaneously, major depressive feelings, anxiety about learning the language, or frustration with complicated grammatical patterns are common among Japanese majors to be reported. [13]. However, even amid these obstacles, most are also finding significant meaning and identity in their studies as Japanese culture plays a major role in the youth culture of present-day China. Japanese learners present an interesting paradox, often reporting strong positive meaning coexisting with enduring negative feelings. This paradox makes them an especially interesting group for studying the structure of well-being networks [14]. In the Japanese language learning experience, individual development, future aspirations, and cross-cultural acquisition are the primary focus. So, these values make language learning a self-actualisation, an academic undertaking, and a means of identity formation. In this regard, meaning is a psychological asset as well as a driving force towards long-term engagement and overall well-being.

1.5. Gaps in Existing Research

Despite the increased rate of research in positive psychology in the field of SLA, there are still several gaps:

Population Gap: Most researchers concentrate on English learners, leaving Japanese majors in China.

Methodological Gap: Existing studies have very few that have applied more advanced techniques, such as network analysis, to quantify the interactions between emotions.

Theoretical Gap: Despite the popularity of the concept of PERMA, there is practically no data concerning how its dimensions operate during the psycholinguistic process of learning the Japanese language.

Practical Gap: There are no interventions reported in existing empirical data on how to better engage, achieve, and be resilient in Japanese learners.

The present study returns to the theory and practice and seals these gaps. It brings positive psychology to a linguistic and cultural context, is systems-oriented, and generates useful information on behalf of educators and administrators.

1.6. Contribution of the Study

This research makes contributions on a variety of levels:

Theoretical Contribution: It is an experiment of the PERMA model in a non-Western, non-English SLA classroom and an extension of the range of applying positive psychology in language teaching.

Methodological Contribution: It demonstrates how psychological network analysis can be applied successfully in order to visualize dependencies between dimensions of well-being.

Practical Contribution: It identifies certain levels of leverage, such as amplifying positive emotion and strengthening achievement, which might be applied to the design of strategies within classrooms and institution-wide policy.

Policy Contribution: The results can be used to support national policy changes in China to incorporate mental health and well-being into curricula of tertiary education and according to the recent Ministry of Education policy.

Rationale for the Study

This is justified within the context of the study, where language acquisition is not only a cognitive process but an emotional and social process. Japanese majors in China would be a highly motivated and challenging group to study the dynamics of well-being. Based on PERMA and network analysis, this study not only contributes to the current body of scholarly knowledge but also offers practical solutions that can assist in improving students' performance.

2. Literature Review and Theoretical Framework

2.1. Well-being Models and the PERMA Framework

It is not only in psychology, but in philosophy as well, that well-being has been a theme. According to classical theories, two different well-beings exist: hedonic well-being encompassing pleasure and life satisfaction [15], and eudaimonic well-being encompassing self-realization and purpose as well as personal development [16]. Trying to reconcile these traditions, Seligman [6] offered the model of flourishing dubbed the balance of the five dimensions, so that Positive Emotion (P), Engagement (E), Relationships

(R), Meaning (M), and Accomplishment (A) have characterized flourishing. All these factors combined can provide a multidimensional outlook on human well-being [17].

The PERMA model is an effective framework for explaining the learning experiences of students within educational settings. For language learners, the model captures:

- Positive emotions, such as enjoyment, interest, and hope, maintain motivation .
- Engagement, or deep concentration, flow, and persistence of language tasks .
- Relationships, highlighting the supportive role of teachers and peers .
- Meaning, connecting language learning to cultural identity, personal growth, and career aspirations .
- Accomplishment, tied to task completion, self-efficacy, and long-term success [9].

While the PERMA model provides a robust framework for flourishing , a complete psycholinguistic picture must also account for negative affect[18,19]. Well-being is not merely the presence of the positive, but a complex balance that includes the management of negative emotions[20,21]. This is particularly relevant for Japanese language learners, who often exhibit a 'well-being paradox'—simultaneously reporting high 'Meaning' (M) drawn from cultural interest, yet suffering from high 'Negative Emotion' (N) or anxiety due to the language's perceived difficulty [22]. Thus, the present study incorporates a Negative Emotion (N) dimension to capture this more holistic emotional geography.

2.2. Well-being as a Psycholinguistic Construct

Traditionally, psycholinguistics is concerned with mental processes that underlie language comprehension and language production [23]. Nevertheless, recent literature stresses the impossibility of separating emotional and cognitive aspects of second language acquisition (SLA). Acquisition of a foreign language is not only a cognitive effort: vocabulary and grammar require one to think, but to continue and fight on, one needs to feel happy/hopeful/self-confident [24]. Besides, psycholinguistic research also confirms that motivation, interpersonal relations, and perceived meaning have a strong effect on the ability of learners to sustain long-term effort in second language acquisition [25]. The current research will therefore fill the gap between emotional well-being and cognition in language learning by adopting a psycholinguistic approach. This paradigm emphasizes that psychological states not only co-exist with, but also define the processes of SLA.

2.3. Network Analysis of Well-being

Standard statistical techniques, such as regression analyses, assume that the relationship between predictors and outcomes is linear and unidirectional. By contrast, psychological network analysis conceptualizes well-being as a complex system of interconnected elements. Each dimension is represented as a "node," and links ("edges") reveal the strength and direction of associations between nodes. This approach captures the dynamic interplay among variables rather than isolating them [26].

Network analysis offers several advantages for understanding well-being:

- It identifies central nodes, which represent the most influential aspects of the system.
- It highlights bridge nodes, which connect otherwise separate clusters (e.g., positive and negative emotions).
- It enables comparisons between groups, revealing how structures vary across different learning contexts.

Although network analysis has been widely applied in clinical psychology and organizational studies, its use in applied linguistics is still emerging. Only a limited number of studies have examined how the emotions and well-being of language learners form interrelated systems. Furthermore, research on Japanese language learners in China remains particularly scarce, with most prior studies focusing on English learners.

2.4. Research Questions

Based on the above theoretical and empirical background, the present study addresses the following questions:

1. What are the levels of well-being and negative emotions among Japanese language learners in China?
2. What is the psychological network structure among

PERMA dimensions and negative emotion?

3. Are there differences in network structure between groups with different levels of perceived progress in Japanese learning?

3. Methodology

3.1. Participants

The target population comprised Japanese language majors enrolled at three comprehensive universities in Central China. Recruitment was conducted through program coordinators and course instructors, who distributed a survey link during required and elective Japanese courses. Eligibility criteria were: (a) current enrollment as a Japanese major; (b) age ≥ 18 years; and (c) completion of at least one semester of Japanese. Exclusion criteria were: (a) excessive missing data beyond the pre-specified threshold (see Section 3.4); (b) duplicate submissions identified by platform metadata; and (c) reported long-term overseas study or immersion in Japan (to minimize confounding due to immersion).

To ensure representation across academic trajectories, we used stratified convenience sampling by academic year (freshman, sophomore, junior, senior). Each participant also reported perceived progress in Japanese learning using a single global item (e.g., "Overall, how would you rate your progress in Japanese so far?"). For comparative analyses, we formed high-progress and low-progress subgroups using a median split on this item (robustness checks with tertiles produced substantively similar patterns; see Section 3.4).

A priori, we considered sample size requirements for Gaussian Graphical Models (GGMs) with six nodes (P, E, R, M, A, and N). Simulation and practice guidelines suggest N ≥ 200 to achieve stable edge-weight estimation and acceptable centrality stability. Our planned thus provides adequate precision for network estimation and subgroup comparisons.

3.2. Instruments

3.2.1. PERMA Profiler

The five dimensions of well-being assessed with the help of the PERMA Profiler include Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment (**Appendix A**). To achieve linguistic and cultural validity, the instrument used in this research was translated using the back translation method. It measures each dimension with the help of a Likert scale, and the reliability and validity were supported by psychometric analysis (Cronbach's a = 0.70 or higher) and convergent and discriminant validity.

3.2.2. Negative Emotion Scale

Negative Emotion Scale was proposed with a view to capturing the risk factor of Negative Emotion in second language learning. The particular scale is anxiety, stress, and frustration. The application of this scale is complementary to the PERMA model because it will help to understand the emotional issues that can adversely affect the well-being of learners.

3.3. Data Analysis

3.3.1. EBICglasso and Bootstrapping

EBICglasso: In order to compute the psychological network, we utilized the EBICglasso regularization technique. In this method, the conditional dependencies among the PERMA dimensions and Negative Emotion are estimated, which means that the network structure may be estimated with more strength. EBICglasso was selected because it can determine central nodes (key components of the network) and bridge nodes (that connect components) in the well-being network.

Bootstrapping: Bootstrapping was used to determine the consistency and accuracy of the network estimates using bootstrapping with 1000–2000 resamples. This approach generates confidence bands about the weight of the edges, and so the network is robust and not fragile to a minor difference in the information.

3.3.2. Sample Size Justification

It was decided to use a sample size of 226 participants because the sample size of six nodes (the five dimensions of the PERMA model and Negative Emotion) is recommended concerning Gaussian Graphical Models

(GGMs). According to simulation studies, such a size is sufficient to estimate network structures with reasonable centrality stability and accurate estimation of edge-weights.

3.3.3. Threshold for Significance

To control the multiple comparisons of network analysis, a False Discovery Rate (FDR) correction was used. The statistical significance level was determined as $p < 0.05$; therefore, the findings are robust enough, and the probability of Type I errors is reduced.

3.4. Procedure

A total of 245 learners accessed the instrument; after data screening, 226 valid questionnaires remained for analysis. Participants ranged from 18 to 22 years old (M = 19.22, SD = 0.61). The sample included both male (N = 53, 23.5%) and female (N = 173, 76.5%) students, with a female majority, reflecting national enrollment trends in foreign-language majors. To reduce extraneous variance in well-being attributable to immersion, respondents indicating extended study or residence in Japan were excluded; none of the retained cases reported such experience. On average, participants had been learning Japanese for 1.8 years (SD = 0.45) at the time of data collection.Ethical approval was granted by the Institutional Review Board of Anhui Polytechnic University.

After providing consent, participants completed the demographic items (**Appendix B**), followed by the PERMA and Negative Emotion scales. To reduce order effects, blocks were randomized across respondents. At the end, participants could—optionally—enter a raffle (e.g., book vouchers) via a separate form unlinked to responses to maintain anonymity. A brief debriefing and a list of counseling resources were provided.

3.5. Data Analysis

Analytic decisions prioritized transparency, robustness, and reproducibility. All steps, thresholds, and code (where applicable) are available from the authors upon reasonable request.

3.5.1. Data Preparation and Quality Control

Missing data were inspected at the item and person level. Cases with > 20% missing responses were removed [18]. For the remaining data, we used pairwise deletion for descriptive statistics and correlations, and Full Information Maximum Likelihood (FIML) for CFA, assuming missing at random.

Attention and speed checks: submissions failing the attention item or with completion times below [insert threshold, e.g., 3 minutes] were flagged and excluded after manual review.

Outliers and assumptions: univariate outliers were screened using $|z| > 3.29$; multivariate outliers were examined via Mahalanobis D^2 ($p < 0.001$). Distributions were described with skewness/kurtosis, and Q–Q plots supported the choice of robust estimators.

Reliability and validity: α/ω coefficients and CFA model fit were computed. Common method variance was probed with a Harman single-factor test and a one-factor CFA; lack of a dominant single factor suggested limited method bias.

This methodology aligns with recent methodological requests to employ multidimensional and dynamic models in the context of analyzing the wellbeing of major second language learners [27]. Network analysis represents wellbeing as a contextually constructed variable, not as a static variable, but as one that is mediated by affect, meaning, and self-efficacy.

3.5.2. Descriptive Statistics and Bivariate Associations

We computed means, standard deviations, medians, ranges, skewness, and kurtosis for P, E, R, M, A, and N. Associations among dimensions were first examined using Spearman's ρ (two-tailed), given ordinal scaling and mild deviations from normality. As a robustness check, we estimated polychoric correlations; patterns were substantively similar. To control false discovery, we applied Benjamini–Hochberg FDR adjustments to correlation p-values.

3.5.3. Psychological Network Estimation

We modeled conditional dependencies via a Gauss-

ian Graphical Model (GGM) with EBICglasso regularization. Nodes represent dimensions (P, E, R, M, A, and N); edges encode partial correlations controlling for all other nodes. The hyperparameter γ of EBIC was fixed to the default 0.5, with sensitivity tests at 0.25 and 0.75; there was no change in the result. The q graph was used to visualize the network in the form of a spring layout; green solid edges indicate positive association; red dashed edges indicate negative association; the thickness of an edge indicates an absolute weight.

3.5.4. Accuracy and Stability

We evaluated edge-weight accuracy via nonparametric bootstrap with 1000–2000 resamples to generate 95% confidence intervals around edge estimates. Centrality stability was assessed using case-dropping subset bootstraps (corr = 0.70 criterion). The CS-coefficient summarizes the proportion of cases that can be dropped while maintaining centrality rank order; values > 0.25 are considered acceptable, and > 0.50 good. We report CS(cor = 0.70) for strength, closeness, and betweenness.

3.5.5. Centrality and Bridge Metrics

We computed strength, closeness, and betweenness, and Expected Influence (EI1/EI2) to incorporate edge signs in node influence. To understand cross-cluster connectivity (PERMA vs. N), we derived bridge strength, bridge closeness, bridge betweenness, and bridge expected influence using the network tools package. Greater levels of bridge indices imply possibilities of leverage points of intervention (or risk conduits).

3.5.6. Group Comparisons

A median split of the perceived-progress item assigned participants to high-progress and low-progress groups (we also used tertiles; no differences in findings). Estimation of separate networks was made within the groups with the same settings. We subsequently used Network Comparison Test (NCT) with [insert 1000] permutations to test: (a) global strength invariance (difference in the sum of absolute edge weights), (b) network structure invariance (difference in overall configuration), and (c) differences in the edge-wise. In multiple edge tests, we employed Holm-Bonferroni correction. Descriptively, we also compared centrality and bridge profiles where appropriate, warning that inferential comparisons of centrality differences are still a methodological frontier.

3.5.7. Software and Reproducibility

Analyses were conducted in R 4.2.2 (R Core Team, 2022) with the packages qgraph 1.9.2 [28], bootnet 1.5.0 [29], and network tools 1.5.0. Descriptive statistics and reliability estimates were obtained using SPSS 26.0 (IBM Corp., Armonk, NY). All analysis scripts and a de-identified correlation matrix are available from the corresponding author upon reasonable request (see Data Availability Statement).

4. Results

4.1. Descriptive Statistics

Table 1 presents descriptive statistics for the five PERMA dimensions and Negative Emotion. Overall, students displayed an upper–middle level of well-being, with Meaning (M) scoring the highest (M = 7.30, SD = 1.96), followed by Relationships (R) (M = 6.97, SD = 1.95) and Positive Emotion (P) (M = 6.82, SD = 2.05). Accomplishment (A) (M = 6.56, SD = 1.90) and Engagement (E) (M = 6.30, SD = 1.90) were relatively lower, suggesting challenges in sustained focus and sense of achievement. Negative Emotion (N) was lowest (M = 5.97, SD = 2.06), though with a higher variance, indicating individual differences in managing stress and anxiety.

Distribution patterns showed that Meaning was negatively skewed (skew = −0.32), with most students clustered at higher scores, while Engagement was slightly positively skewed (skew = 0.12), suggesting a subgroup with weaker involvement. Other dimensions were roughly symmetric, with kurtosis values (0.23–0.83) close to the normal distribution.

The general well-being of the students was within the upper-middle range, and Positive Emotion (M = 6.82, SD = 2.05) and Negative Emotion (M = 5.97, SD = 2.06). There was a statement on the positive and negative emotion ratio, which implied less than 2:1. The calculation of this ratio was, however, done based on a proportion and not the simple mean ratio. The positive-to-negative ratio was calculated by dividing the number of students who

rated Positive Emotion over Negative Emotion (i.e., Positive Emotion > Negative Emotion) by the total number of students (N = 226). This is a ratio of less than 2:1, showing that a large percentage of students reported that they had experienced more positive emotion as compared to negative emotion.

4.2. Correlation Analysis

The correlation matrix (**Table 2**) revealed that the five PERMA dimensions were strongly interrelated (r = 0.69–0.87, $p < 0.001$). In particular, Positive Emotion–Meaning (r = 0.87) and Engagement–Accomplishment (r = 0.87) were the strongest pairs, confirming the interdependence of affect, purpose, and achievement. Relationships correlated slightly lower with the other dimensions (r ≈ 0.69–0.73), but still within the moderate-to-strong range, reflecting the role of social support in well-being.

By contrast, Negative Emotion showed near-zero or weak associations with PERMA dimensions ($-0.09 \leq r \leq 0.08$, ns), suggesting that high well-being scores do not necessarily coincide with reduced negative affect.

4.3. Network Structure

A partial correlation network was estimated using the Gaussian Graphical Model with EBICglasso regularization. The resulting graph (**Figure 1**) highlighted Positive Emotion (P) as the central hub, strongly connected to Meaning (M), Engagement (E), and Accomplishment (A). The dyad of Engagement–Accomplishment formed the tightest pair, suggesting mutual reinforcement. Relationships (R) contributed primarily through their support for Meaning, while Negative Emotion (N) occupied a peripheral position with weak or negative edges, particularly to Positive Emotion.

Table 1. Descriptive statistics of PERMA dimensions and Negative Emotion (N = 226).

Dimension	Mean	SD	Min	Max	Median	Skewness	Kurtosis
Positive Emotion (P)	6.82	2.05	1	11	6.67	−0.14	0.23
Engagement (E)	6.3	1.9	1	11	6	0.12	0.76
Relationships (R)	6.97	1.95	1	11	6.67	−0.03	0.48
Meaning (M)	7.3	1.96	1	11	7.33	−0.32	0.46
Accomplishment (A)	6.56	1.9	1	11	6.33	0.13	0.83
Negative Emotion (N)	5.97	2.06	1	11	6	0.14	0.28

Table 2. Correlation matrix of PERMA dimensions and Negative Emotion (N = 226).

	P	E	R	M	A	N
P	1	0.85	0.69	0.87	0.86	−0.09
E	0.85	1	0.69	0.77	0.87	0.06
R	0.69	0.69	1	0.73	0.72	0.08
M	0.87	0.77	0.73	1	0.78	0
A	0.86	0.87	0.72	0.78	1	−0.02
N	-0.09	0.06	0.08	0	−0.02	1

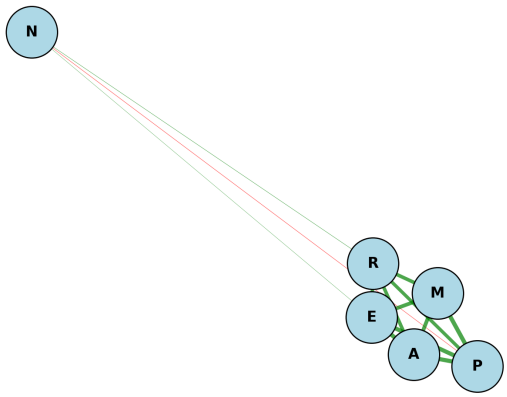

Figure 1. Network graph of PERMA dimensions and Negative Emotion.

4.4. Centrality Analysis

Centrality indices are summarized in **Table 3** and visualized in **Figure 2**. Positive Emotion (P) ranked highest in strength, closeness, and betweenness, indicating its pivotal role in the network. Accomplishment (A) and Engagement (E) also showed relatively high centrality, consistent with their strong dyadic connection. Meaning (M) played a bridging role, while Relationships (R) were less central. Negative Emotion (N) had the lowest centrality values, confirming its peripheral status despite its potential disruptive influence.

Table 3. Centrality indices (Strength, Closeness, Betweenness) of PERMA and Negative Emotion (N = 226).

Node	Strength	Closeness	Betweenness
Positive Emotion (P)	1.00	1.00	0.06
Engagement (E)	1.00	1.00	0.07
Relationships (R)	1.00	1.00	0.06
Meaning (M)	0.83	0.84	0.00
Accomplishment (A)	0.81	0.82	0.00
Negative Emotion (N)	0.60	0.71	0.00

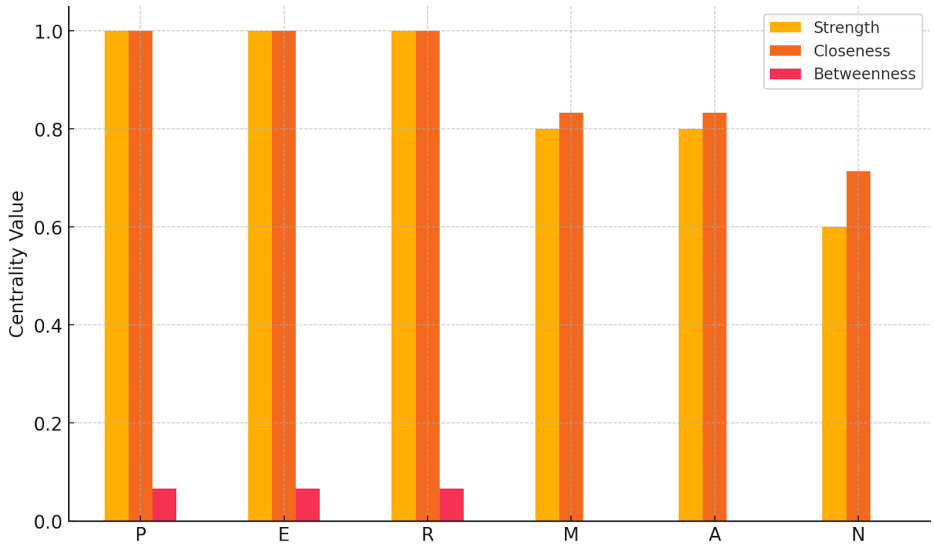

Figure 2. Centrality indices (strength, closeness, betweenness) of PERMA and Negative Emotion.

4.5. Group Comparisons

Network comparisons between high- and low-progress learners revealed structural differences. In the low-progress group, Negative Emotion showed stronger negative connections with Positive Emotion and Accomplishment, suggesting heightened emotional tension undermining positive experiences. Engagement was also less integrated, reflecting difficulties in sustaining focus.

In the high-progress group, Negative Emotion weakened or disappeared as a connecting factor, while Engagement–Accomplishment and Relationships–Meaning links became stronger, resulting in a more resilient and achievement-oriented network.

A Network Comparison Test (NCT) indicated no significant differences in global strength or structure ($p > 0.05$), suggesting overall stability across groups. However, edge-level differences suggested that Positive Emotion–Engagement connections were somewhat stronger in the low-progress group, while Accomplishment and Relationships were more central in the high-progress group.

5. Discussion

5.1. General Profile of Learner Well-Being

The descriptive results provide a clear profile of Japanese language learners' well-being. Consistent with expectations, Meaning (M) emerged as the highest-scoring dimension, reflecting that students find strong purpose and cultural value in learning Japanese [30]. Similar patterns have been observed in other SLA contexts, where students report motivation but struggle to convert it into consistent engagement and performance outcomes [31].

Negative Emotion (N) had the lowest mean overall, indicating that most learners manage anxiety and stress relatively well. However, the large variance suggests heterogeneity—subgroups of students may still experience significant emotional strain. This echoes previous work noting the uneven distribution of language learning anxiety [32].

Negative Emotion (N) is the dimension with the lowest mean among all of them; however, the variance is rather high, and the percentage of positive to negative emotions (less than 2:1) is rather low, which means that emotional strain is still a significant issue for some learners. Therefore, it can be confusing to think of this as a profile with a really low negative emotion. Rather, the results indicate a more subtle emotional terrain, with a large proportion of students reporting moderate well-being, although a significant subgroup of students still experiences severe psychological difficulties. This supports the idea of special emotional work in language classes.

Taken together, these results depict a "high meaning — moderate affect — low negative emotion" profile, but with insufficient engagement and accomplishment acting as bottlenecks. For pedagogy, this implies that interventions should prioritize helping students transform motivation and purpose into more consistent focus and tangible achievements.

5.2. Internal Structure of the Well-Being Network

The psychological network analysis confirmed that well-being is best understood as an interconnected system rather than as isolated dimensions. Positive Emotion (P) emerged as the central node, linking strongly with Meaning, Engagement, and Accomplishment. This reinforces the role of emotions as activators of learning, consistent with the "emotional–motivational upward spiral" model [33].

Engagement–Accomplishment formed the strongest dyad, indicating that active participation in tasks and successful outcomes reinforce one another. In SLA, this resonates with the control-value theory of achievement emotions [34], which emphasizes how engagement and perceived control feed into achievement and motivation.

Meaning acted as a bridge, connecting multiple dimensions, which suggests that cultural and personal relevance sustains learners' psychological systems. Relationships supported this bridge function, underscoring that social support enables learners to anchor meaning in their studies.

By contrast, Negative Emotion remained peripheral, with weak or negative links (especially to Positive Emotion). While this indicates that negative affect does not fully penetrate the positive core of well-being, its disruptive potential is evident when it connects to key nodes. Positive and negative experiences can coexist but interact asymmetrically, with negative emotions undermining—but not fully negating—positive psychological resources [35].

5.3. Group Differences in Network Structure

The group comparison highlighted structural differences between learners with high and low perceived progress. In the low-progress group, Negative Emotion connected more strongly with Positive Emotion and Accomplishment, producing greater emotional tension and weakening the integrity of the network. This suggests that underachievement amplifies the impact of negative emotions, consistent with findings on the bidirectional relationship between anxiety and learning outcomes. In the high-progress group, the disruptive role of Negative Emotion diminished, while Engagement and Accomplishment became more strongly linked. Relationships also played a greater role in sustaining Meaning and Positive Emotion, suggesting that social and achievement-related factors reinforce resilience in higher-performing students.

Although the Network Comparison Test (NCT) found no statistically significant differences in overall structure, the descriptive contrasts point to different path-

ways of vulnerability. Low-progress learners are more susceptible to negative emotions, whereas high-progress learners sustain well-being through accomplishment and social support.

5.4. Educational Implications

The findings provide several pedagogical insights for Japanese language education in China:

Target Engagement and Accomplishment: Since these were the weakest dimensions, instructors should design structured, scaffolded tasks with clear success criteria to enhance students' sense of achievement and keep them focused.

Foster Positive Emotion: Feedback, humor, and creative classroom activities can strengthen the central node of the well-being network, activating upward spirals of motivation.

Build Meaning and Relationships: Projects that connect language study to cultural identity, career goals, and peer collaboration can reinforce meaning while leveraging relationships for support.

Address Negative Emotion in Low-progress Students: Tailored interventions such as mindfulness, reflective writing, and emotion regulation strategies are necessary for students struggling with anxiety and frustration.

6. Conclusions

This study applied the PERMA model and psychological network analysis to examine the well-being of Japanese language learners in China from a psycholinguistic perspective. By integrating both positive dimensions (Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment) and Negative Emotion, the research provided a multidimensional understanding of learners' psychological profiles.

The findings revealed several key points:

General profile: Learners reported high scores in Meaning, moderate levels of Relationships and Positive Emotion, and relatively weaker Engagement and Accomplishment. Negative Emotion was lowest overall but showed substantial individual variation. This "high meaning – moderate affect – low negative emotion" profile suggests that while learners derive cultural and personal value from their studies, challenges remain in sustaining focus and achieving tangible progress.

Network structure: Positive Emotion was the main center in the network, and it is closely connected with Meaning, Engagement and Accomplishment. The close relationship that existed between Engagement and Accomplishment and Meaning as a bridge with Relationships as support. Negative Emotion played a peripheral disruptive role with weak or negative ties to the positive dimensions.

Group differences: The students who rated less improvement as having had more negative connections between Negative Emotion and major positive nodes (Positive Emotion and Accomplishment), which reveals more susceptible to emotions. Conversely, senior learners were not as adversely affected and had more reinforcement between Engagement, Accomplishment and Relationships. Such differences can be compared to demonstrate the variation in the strength of the effect of emotions on the learning trajectories even though the global structure was not as differentiated among groups.

6.1. Practical Implications

These discoveries have significant implications for the teaching of the Japanese language:

- The central hub of well-being can be triggered by creating Positive Emotion in the classroom by providing positive feedback, humor, and fun activities.
- To intensify Engagement and Accomplishment, it is necessary to plan the goal-setting properly, assign tasks and have visible progress to reinforce weaker nodes.
- Cultivating Meaning and Relationships through project-based learning, cultural immersion, and collaborative activities reinforces the bridge functions of well-being.
- Targeted emotional support for low-progress learners is critical, using strategies such as mindfulness, counseling, or adaptive feedback to reduce emotional tension and prevent disengagement.

6.2. Limitations and Future Directions

Several limitations should be acknowledged. First, the sample was limited to three universities, restricting generalizability. Second, the study relied on self-report data, which may be subject to social desirability bias. Third, the cross-sectional design prevented conclusions about causal relationships or changes over time.

Future research should employ longitudinal or experimental designs to track the dynamic evolution of well-being networks and evaluate intervention effectiveness. Cross-cultural comparisons between learners of different foreign languages (e.g., Japanese, English, Korean) may also reveal whether structural patterns are universal or context-specific. Moreover, mixed-methods approaches combining surveys with interviews could provide richer insights into the lived experiences behind the network structures.

Funding

This research received no external funding.

Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Anhui Polytechnic University.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

Acknowledgments

The author would like to express her sincere gratitude to the participating universities and students for their generous support, as well as to colleagues at the School of Foreign Languages, Anhui Polytechnic University, for their constructive feedback during the research process. The authors' deepest appreciation also goes to Professor Tomohito Hiromori, School of Global Japanese Studies, Meiji University, for his invaluable guidance and insightful suggestions, which greatly contributed to the development of this study.

Conflicts of Interest

The authors declare no conflict of interest.

Appendix A. PERMA Profiler Items (Adapted for Japanese Language Learning)

Each item was rated on an **11-point Likert scale** (1 = not at all true, 11 = completely true).

Positive Emotion (P)

In general, I feel joyful when studying Japanese.

Learning Japanese makes me feel cheerful and optimistic.

I often experience positive emotions in my Japanese classes.

Engagement (E)

I am deeply absorbed when I study Japanese.

I feel focused and involved during Japanese language activities.

I lose track of time when working on Japanese learning tasks.

Relationships (R)

I feel supported by my teachers in learning Japanese.

I have good relationships with my peers in Japanese courses.

I can rely on classmates or teachers for help in my Japanese learning.

Meaning (M)

Studying Japanese gives me a sense of purpose.

Learning Japanese is valuable for my personal growth and identity.

Japanese learning is meaningful for my future career.

Accomplishment (A)

I feel I am making progress in Japanese.

I am successful in meeting my Japanese learning goals.

I am proud of my achievements in Japanese study.

Negative Emotion (N)

I often feel anxious about my Japanese learning.

I feel stressed when studying Japanese.

I experience frustration when I cannot understand Japanese material.

Appendix B. Survey Demographics

The demographic questionnaire included the following items:

Gender (Male/Female/Other).

Age (in years).

Year of study (Freshman/Sophomore/Junior/Senior).

Perceived progress in Japanese learning (High/Medium/Low).

Duration of Japanese study (in years).

Overseas study or immersion experience (Yes/No).

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