

Beyond the Average Learner: A Latent Profile Analysis of English Learning Strategy Use among University Students

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Abstract: Research on English learning strategies has traditionally relied on variable-centered analyses that describe the average learner, implicitly treating strategy use as a relatively uniform construct across individuals. Such an approach, however, may obscure meaningful differences in how learners actually combine and rely on strategies. This study adopted a person-centered approach to examine the heterogeneity of English learning strategy use among 251 university students. Participants completed a 50-item questionnaire adapted from Oxford's (1990) Strategy Inventory for Language Learning (SILL), covering six dimensions: memory, cognitive, compensation, metacognitive, affective, and social strategies. Latent profile analysis (LPA) was used to identify subgroups of learners with distinct strategy-use patterns. A three-profile solution was retained, comprising a Low Strategy Use profile (14.7%), a Moderate Strategy Use profile (58.2%), and a High Strategy Use profile (27.1%). The three profiles differed consistently across all six strategy dimensions, with the High profile showing a comparatively pronounced elevation in metacognitive strategy use. These findings indicate that English learning strategy use is not homogeneous across the student population and that mean-level statistics alone may mask important subgroup differences. The results carry implications for differentiated strategy instruction, particularly the need to strengthen metacognitive regulation among moderate- and low-profile learners rather than applying uniform strategy training to all students.

Keywords: English learning strategies; Latent profile analysis; Learner heterogeneity; Person-centered approach; Strategy use profiles

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1. Introduction

Language learning strategies have long occupied a central place in second language acquisition (SLA) research and continue to represent a vibrant area of inquiry despite more than five decades of scholarly development^[1,2]. More recently, learning strategy research has increasingly been integrated with the broader framework of self-regulated learning, emphasizing learners' active planning, monitoring, and evaluation of their own

learning processes^[3]. Since Oxford (1990) introduced the Strategy Inventory for Language Learning (SILL)^[1], the instrument has been widely adopted in strategy research. Numerous studies have subsequently examined which strategies learners use, how frequently they use them, and how strategy use relates to variables such as proficiency, motivation, gender, and learning context. Research involving Chinese university students has also indicated variations in learners' use of different strategy dimensions, particularly in relation to metacognitive and cognitive strategies^[4]. This line of inquiry has generated valuable descriptive knowledge about English learning strategies in general. However, much of this research shares a common analytic assumption: that a single set of mean scores and correlational relationships among variables can adequately represent the population of learners.

This assumption is worth reconsidering. Recent L2 research has increasingly argued that variable-centered analyses may overlook meaningful individual heterogeneity because they primarily describe average relationships among variables rather than distinct configurations of learners^[5]. Classroom experience and theoretical accounts of self-regulated learning both suggest that learners do not uniformly approach strategy use. Some students rely heavily on a broad repertoire of strategies across memory, cognitive, compensation, metacognitive, affective, and social domains. Others use strategies only sparingly or inconsistently, whereas still others emphasize certain strategy types while neglecting others. When such qualitatively distinct patterns exist within a population, an analysis that reports only the sample mean and standard deviation risks concealing the very structure that is most pedagogically informative. A mean score close to the midpoint of a rating scale, for instance, could reflect a population in which most learners cluster near that midpoint, or it could reflect a population sharply divided between low and high strategy users whose scores happen to average out near the center. These two scenarios call for very different instructional responses, yet a purely variable-centered analysis cannot distinguish between them.

This concern motivates the shift toward a person-centered approach in the present study. Rather than asking how strategy dimensions relate to one another or to external variables across the sample as a whole, a person-centered approach asks whether meaningfully different subgroups, or profiles, of learners exist within the population, and what distinguishes one profile from another^[6]. Latent profile analysis (LPA) provides a principled statistical method for this purpose. Unlike ad hoc grouping procedures such as median splits or cluster analysis based on arbitrary distance metrics, LPA is a model-based technique that estimates the number and composition of latent subgroups from the observed data themselves, and offers quantitative criteria such as information criteria and entropy to guide the choice of the most defensible number of profiles.

The present study applies LPA to strategy-use data collected from university students using an instrument based on Oxford's (1990) six-dimension framework. The purpose is not to re-examine the correlates of strategy use, which have already received considerable attention in the literature, but to ask a more basic descriptive question: do distinguishable profiles of strategy users exist among university English learners, and if so, what do these profiles look like? Three research questions guide the study. First, does English learning strategy use among university students show distinct latent profiles, and if so, how many profiles best characterize the data? Second, how do these profiles differ from one another in terms of their strategy-use patterns across the six SILL dimensions? Third, what do these profiles suggest for the design of strategy instruction in the English language classroom?

Addressing these questions contributes to the literature in a modest but useful way. It does not propose a new theory of language learning strategies, nor does it claim that person-centered analysis supersedes variable-centered research. Rather, it demonstrates how a complementary analytic lens can reveal heterogeneity in

strategy use that mean-level statistics alone cannot capture, and it translates that heterogeneity into concrete considerations for differentiated strategy instruction. The remainder of this article reviews relevant literature on English learning strategies, learner heterogeneity, and the use of LPA in language education research; describes the sample, instrument, and analytic procedure; reports the results of the latent profile analysis; and discusses the implications and limitations of the findings.

2. Literature review

2.1. English learning strategies

English learning strategies refer to the specific actions, behaviors, and mental processes that learners deliberately employ to facilitate the acquisition, storage, retrieval, and use of the target language. Oxford's (1990) taxonomy remains the most widely used framework in this area, distinguishing six broad categories of strategy: memory strategies, which help learners store and retrieve new information; cognitive strategies, which involve direct manipulation or transformation of the language input; compensation strategies, which allow learners to overcome gaps in knowledge during comprehension or production; metacognitive strategies, which involve planning, monitoring, and evaluating one's own learning; affective strategies, which help learners manage emotions, motivation, and attitudes toward learning; and social strategies, which involve interaction and cooperation with others in the learning process. The associated instrument, the Strategy Inventory for Language Learning (SILL), has been used extensively across educational contexts and remains a standard tool for assessing self-reported strategy use in this six-dimension structure.

A large body of research using the SILL, or instruments derived from it, has documented associations between strategy use and variables such as language proficiency, motivation, gender, learning environment, and academic achievement ^[7]. This body of evidence consistently suggests that more frequent and effective strategy use is associated with more favorable language learning outcomes. This research has been informative in establishing that strategy use is not inconsequential to learning outcomes, and it has helped identify which categories of strategy tend to be used more or less frequently by learners in different settings. At the same time, this body of work has been predominantly variable-centered in orientation: it has asked how strategy dimensions correlate with one another and with external variables at the level of the sample as a whole, treating the population of learners as if it were reasonably homogeneous with respect to the underlying processes generating strategy use.

2.2. Learner heterogeneity in strategy use

A separate but related strand of thinking in SLA has emphasized individual differences among learners, including differences in motivation, learning style, self-regulatory capacity, and strategic behavior ^[5]. This perspective suggests that learners are not interchangeable units drawn from a single homogeneous distribution but instead may belong to qualitatively distinct subgroups that differ not merely in degree but in the overall configuration of their learning behavior ^[5]. Within the domain of learning strategies specifically, this raises the possibility that some learners consistently deploy a wide range of strategies across all six SILL dimensions, others use strategies only sparingly or unevenly, and still others may show intermediate or mixed patterns. If such heterogeneity exists, then any single mean-based description of “the average English learner’s strategy use” is, at best, an approximation that applies fully to no actual learner and, at worst, a misleading summary that combines fundamentally different types of learners into one figure.

This possibility can be tested directly through person-centered analysis, which lets the data indicate

whether learners form a single group or a mixture of qualitatively distinct subgroups, rather than assuming homogeneity in advance ^[6]. This shift in analytic orientation is the central theoretical rationale for the present study.

2.3. Application of latent profile analysis in language education

Latent profile analysis (LPA) is a finite mixture modeling technique designed to identify unobserved (latent) subgroups within a population based on individuals' patterns of responses across a set of continuous indicator variables. Unlike traditional cluster analysis, which relies on distance-based heuristics with no formal statistical criteria for selecting the number of clusters, LPA is a model-based procedure grounded in probability theory that compares candidate models using quantitative fit indices, while also requiring attention to the interpretability and practical adequacy of the resulting class sizes.

Although LPA and related mixture-modeling techniques have been applied productively in adjacent areas of educational and psychological research to identify distinct learner or respondent profiles, their application specifically to English learning strategy data remains comparatively limited. Recent person-centered studies have successfully applied latent profile analysis to a range of second language constructs, including self-regulated learning strategies and writing self-efficacy ^[8] as well as basic psychological needs and foreign language emotions ^[9], illustrating the usefulness of LPA for uncovering meaningful learner heterogeneity. Nevertheless, most existing research on English learning strategies has continued to rely on variable-centered designs. This gap constitutes the central point of departure for the present study: rather than adding another variable-centered account of how strategy dimensions relate to outcomes, this study applies LPA to ask a person-centered question that the existing literature has largely left unaddressed, namely, whether distinguishable profiles of strategy users exist among university English learners, and what these profiles look like in practice.

3. Method

3.1. Participants

A total of 251 university students participated in this study. The sample was almost evenly split by gender, comprising 126 male students (50.2%) and 125 female students (49.8%). In terms of academic year, the sample included 30 freshmen (12.0%), 84 sophomores (33.5%), 3 juniors (1.2%), and 134 seniors (53.4%). Participants were drawn from a range of academic majors, with the largest proportion studying Business and Economics (n = 144, 57.4%), followed by Languages and Literature (n = 69, 27.5%), Engineering (n = 35, 13.9%), and Social Sciences (n = 3, 1.2%). **Table 1** presents the full demographic breakdown of the sample.

Table 1. Demographic Characteristics of Participants (N = 251)

Variable	Category	n	%
Gender	Male	126	50.2
	Female	125	49.8
Grade	Freshman	30	12.0
	Sophomore	84	33.5
	Junior	3	1.2
	Senior	134	53.4

Variable	Category	n	%
Major	Business and Economics	144	57.4
	Languages and Literature	69	27.5
	Engineering	35	13.9
	Social Sciences	3	1.2

3.2. Instrument

English learning strategy use was assessed using a 50-item questionnaire adapted from Oxford's (1990) Strategy Inventory for Language Learning (SILL). The instrument measures six dimensions of strategy use: memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies, and social strategies. Consistent with the original SILL format, items were rated on a 5-point Likert scale, and a mean score was computed for each of the six dimensions for every participant, with higher scores indicating more frequent self-reported use of strategies within that dimension.

3.3. Analytic strategy

Analyses proceeded in two stages. First, descriptive statistics (means and standard deviations) were computed for each of the six strategy dimensions across the full sample, to characterize overall levels of strategy use before turning to the person-centered analysis. Second, latent profile analysis (LPA) was conducted using the six dimension scores as continuous indicators to identify subgroups of learners with qualitatively distinct strategy-use patterns. A series of models specifying two, three, and four latent profiles was estimated and compared using the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), the sample-size-adjusted BIC (aBIC), entropy, and the proportion of the sample assigned to the smallest latent class. Lower AIC, BIC, and aBIC values indicate better model fit relative to model complexity, while higher entropy values (approaching 1.0) indicate clearer separation between classes and more reliable classification of individuals. The proportion of participants in the smallest class was also examined, as a very small class can indicate an unstable or substantively uninterpretable solution even when information criteria continue to improve. The final number of profiles was determined by jointly considering these statistical indices, the interpretability of the resulting profiles, and the adequacy of class sizes, rather than by information criteria alone.

4. Results

4.1. Descriptive statistics

The means and standard deviations for the six English learning strategy dimensions across the full sample are reported in the Total Sample column of **Table 3** (see Section 4.3), alongside the mean scores for the three latent profiles. Mean scores across all six dimensions clustered narrowly around the midpoint of the 5-point scale, ranging from 2.94 (Social strategies, SD = 0.830) to 3.09 (Compensation strategies, SD = 0.779). Memory, Cognitive, and Affective strategies each had a mean of 3.02, while Metacognitive strategies had a mean of 3.08. At the level of the sample as a whole, these figures suggest a moderate, fairly uniform level of self-reported strategy use, with Social strategies showing the lowest average use and Compensation strategies the highest. As will become clear in the following sections, however, this apparently uniform picture at the sample level conceals considerable heterogeneity once individual response patterns are examined through

latent profile analysis.

4.2. Latent profile model selection

Three candidate LPA models, specifying two, three, and four latent profiles, were estimated and compared. As shown in **Table 2**, AIC, BIC, and aBIC values decreased consistently as the number of profiles increased, from the two-profile solution (AIC = 2848.618, BIC = 2915.602, aBIC = 2855.369) to the three-profile solution (AIC = 2275.204, BIC = 2366.866, aBIC = 2284.443) and further to the four-profile solution (AIC = 1873.434, BIC = 1989.774, aBIC = 1885.161). Entropy likewise increased across the three models, from .939 for the two-profile solution to .943 for the three-profile solution and .959 for the four-profile solution, indicating that classification accuracy remained high, and even improved slightly, as additional profiles were added.

However, the proportion of participants assigned to the smallest latent class declined sharply across the three models: 26.3% for the two-profile solution, 14.7% for the three-profile solution, and only 5.2% for the four-profile solution. A smallest-class proportion as low as 5.2% raises concern about the stability and substantive interpretability of the four-profile solution, since a very small class is more susceptible to being an artifact of the estimation procedure rather than a genuine, replicable subpopulation. Balancing the continued improvement in information criteria against the markedly more adequate class size and comparably strong entropy of the three-profile solution, the three-profile model was selected as the final solution for substantive interpretation.

Table 2. Fit indices for latent profile models

Number of Profiles	AIC	BIC	aBIC	Entropy	Smallest Class Proportion
2	2848.618	2915.602	2855.369	.939	26.3%
3	2275.204	2366.866	2284.443	.943	14.7%
4	1873.434	1989.774	1885.161	.959	5.2%

4.3. Characteristics of the three latent profiles

Table 3 presents the means and standard deviations for the six strategy dimensions in the total sample, together with the mean scores for the three latent profiles. The first profile, labeled Low Strategy Use ($n = 37$, 14.7% of the sample), was characterized by the lowest mean scores across all six dimensions, ranging from 1.629 (Social) to 1.855 (Memory), well below the midpoint of the rating scale. The second profile, labeled Moderate Strategy Use ($n = 146$, 58.2% of the sample), constituted the largest group and showed mean scores clustering near the midpoint of the scale, ranging from 2.864 (Social) to 3.066 (Compensation). The third profile, labeled High Strategy Use ($n = 68$, 27.1% of the sample), displayed the highest mean scores across all six dimensions, ranging from 3.853 (Compensation and Social, tied) to 3.947 (Metacognitive).

The three profiles maintained a consistent rank order across all six dimensions, with the Low profile scoring lowest, the Moderate profile scoring in between, and the High profile scoring highest on every dimension without exception. Within the High profile, the Metacognitive dimension (3.947) stood out as the single highest mean score recorded in the entire table, slightly exceeding the other five dimensions within that same profile. In contrast, within the Low profile, the Social dimension (1.629) was the lowest score recorded in the table, and Social strategies were also the lowest-scoring dimension within the Moderate profile (2.864). As shown in **Table 3**, the three latent profiles differed primarily in their overall levels of strategy use rather than in the shapes of their profiles across the six strategy dimensions, and all three profiles departed from the

total-sample means in the same direction on every dimension. Metacognitive strategies were comparatively more elevated among High Strategy Use learners, whereas Social strategies consistently showed the lowest scores across the total sample and all three profiles.

Table 3. Descriptive statistics and mean scores of learning strategy dimensions for the total sample and three latent profiles

Learning Strategy	Total Sample (N = 251)	Profile 1: Low (n = 37)	Profile 2: Moderate (n = 146)	Profile 3: High (n = 68)
Memory	3.02 (0.783)	1.855	2.921	3.891
Cognitive	3.02 (0.775)	1.779	2.949	3.880
Compensation	3.09 (0.779)	1.840	3.066	3.853
Metacognitive	3.08 (0.787)	1.796	3.004	3.947
Affective	3.02 (0.800)	1.767	2.945	3.889
Social	2.94 (0.830)	1.629	2.864	3.853

5. Discussion

As anticipated in the Introduction, the present findings show that English learning strategy use in this sample is not homogeneous: the latent profile analysis revealed three distinguishable subgroups, Low, Moderate, and High Strategy Use, differing consistently in the same rank order across all six SILL dimensions, even though the sample-level means in **Table 3** suggested a fairly uniform pattern^[10].

The largest group in this sample, comprising more than half of all participants (58.2%), belonged to the Moderate Strategy Use profile. This suggests that the “typical” English learner in this context is neither a highly strategic nor a strategy-avoidant learner, but occupies a middle ground in which strategies across all six dimensions are used with some regularity but without particular intensity. From an instructional standpoint, this majority group may benefit most from strategy instruction that helps them move from inconsistent or moderate use toward more deliberate and systematic application of strategies already familiar to them, rather than from an introduction to entirely new strategic behaviors.

The High Strategy Use profile, comprising 27.1% of the sample, showed consistently higher scores across all six dimensions, with Metacognitive strategies standing out as the single highest score across all profiles (see **Table 3**). This pattern is consistent with the broader understanding of metacognition as a regulatory capacity that coordinates other learning strategies within self-regulated learning^[3]. Learners who plan, monitor, and evaluate their own learning may be better positioned to deploy memory, cognitive, compensation, affective, and social strategies more fully and purposefully^[11]. However, the cross-sectional nature of the data does not permit conclusions about whether metacognitive regulation drives the use of other strategy dimensions. The Low Strategy Use profile, though the smallest group (14.7%), scored well below the scale midpoint on every dimension, with Social strategies the weakest overall. These learners appear to underuse strategic behavior across the board rather than favor some strategy types over others, and are likely to require systematic, foundational strategy training across all six dimensions rather than instruction that assumes baseline familiarity with strategic learning.

These findings point toward several practical implications for English strategy instruction. First, because metacognitive strategies appeared to be particularly elevated in the High profile, classroom instruction might place special emphasis on cultivating learners’ capacity for self-regulation, including planning, self-

monitoring, and self-evaluation of their own learning process, as a means of supporting broader strategic engagement. Second, the existence of three distinguishable profiles suggests that differentiated strategy instruction, tailored to learners' current level and pattern of strategy use, is likely to be more effective than a single standardized strategy-training program applied uniformly to an entire class. Third, and relatedly, these results caution against a standardized approach to strategy instruction: treating all students as though they occupy the same moderate profile, as sample-level statistics alone might imply, risks under-challenging high-profile learners while under-supporting low-profile learners who may need more basic and comprehensive strategy training.

6. Conclusion

This study applied latent profile analysis to examine heterogeneity in English learning strategy use among 251 university students. Three distinct profiles emerged: a Low Strategy Use profile, a Moderate Strategy Use profile comprising the majority of the sample, and a High Strategy Use profile characterized by a comparatively pronounced elevation in metacognitive strategy use. These findings show that strategy use in this population is not adequately captured by sample-level means alone, and that a person-centered analytic approach can reveal subgroup structure that a purely variable-centered analysis would leave undetected. Rather than proposing new relationships among variables, this study demonstrates that English learners can be usefully understood as belonging to qualitatively different strategy-use profiles, each calling for the differentiated instructional response outlined in the Discussion above.

Several limitations should be acknowledged. The sample size, while adequate for the latent profile analysis conducted here, was relatively modest and drawn from a specific set of academic majors, which may limit the generalizability of the profile structure to other populations of English learners. The cross-sectional design means that the profiles identified reflect a single point in time and cannot speak to how learners might move between profiles as their learning progresses. Finally, strategy use was assessed entirely through self-report, which is subject to the usual limitations of retrospective and subjective judgment, including the possibility that learners' perceptions of their own strategy use do not fully correspond to their actual behavior. Future research employing larger and more diverse samples, longitudinal designs, and complementary behavioral or observational measures would help to confirm and extend the profile structure identified here.

Disclosure statement

The authors declare no conflict of interest.

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