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Modelling the Pathways from Motivation to English Proficiency: The Mediating Roles of Self-Efficacy and Language Learning Strategies in EFL Context

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ABSTRACT

This study investigates the interrelationships among intrinsic motivation (INM), extrinsic motivation (EXM), self-efficacy (SE), language learning strategies (LLS), and English proficiency (EP) within a unified Structural Equation Modeling (SEM) framework. The model integrates Self-Determination Theory (SDT), Social Cognitive Theory (SCT), and Oxford's Strategy Inventory for Language Learning (SILL). Data were collected from 303 undergraduate English as a Foreign Language (EFL) learners in Saudi Arabia and Yemen using a survey. The SEM analysis revealed that INM significantly predicted both SE ($\beta = 0.530$, $p < 0.001$) and EP ($\beta = 0.228$, $p < 0.01$), whereas EXM showed no significant direct or indirect effects. SE strongly predicted LLS use ($\beta = 0.676$, $p < 0.001$), which in turn was a robust predictor of EP ($\beta = 0.523$, $p < 0.001$). Mediation analyses supported the sequential pathway from INM through SE and LLS to EP ($\beta = 0.187$, $p < 0.001$). This confirms SE and LLS use as key cognitive and behavioral mechanisms linking motivation to outcomes. The model explained 42% of the variance in proficiency, 45.7% in LLS, and 32.7% in SF. These findings extend prior EFL research by empirically validating a combined theoretical approach and demonstrating that INM rather than EXM drives proficiency gains via cognitive beliefs and strategic behaviors. The results have theoretical and practical implications, informing curriculum design, instructional practices, and learner support strategies in Middle Eastern EFL contexts.

Keywords: Intrinsic Motivation; Extrinsic Motivation; Self-Efficacy; Language Learning Strategies; English Proficiency; Structural Equation Modeling

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1. Introduction

English language proficiency remains a central goal in EFL instruction. However, learners often struggle to progress despite extensive classroom exposure, pointing to the need to examine psychological and strategic influences beyond instruction [1], indicating the need to examine more profound psychological and strategic influences. Affective factors such as motivation—especially its intrinsic and extrinsic components, as in Self-Determination Theory (SDT) [2]—have consistently predicted second-language outcomes and remain foundational in EFL studies [3,4]. Recent research continues to highlight new motivational influences; for instance, Ding and Wang demonstrated that teacher immediacy significantly predicted engagement and motivation among Chinese SFL learners, underscoring the role of teacher–student interaction in sustaining learner motivation [5]. While motivation drives persistence, the mechanisms linking it to beliefs, strategies, and proficiency remain underexplored.

Self-efficacy (SE), or the belief in one's capacity to perform specific learning tasks [6], is also a primary predictor of engagement and persistence in language learning. Grounded in Bandura's [6] Social Cognitive Theory (SCT), numerous studies have demonstrated that learners with higher SE tend to establish goals, maintain persistence, and achieve greater success in skill acquisition [7–9]. For instance, Teng and Wu [8] showed that SE predicted metacognitive strategy use and improved English writing, illustrating how affective beliefs can translate into outcomes. However, this mediation model is rarely tested comprehensively using Structural Equation Modelling (SEM), particularly in traditional classroom-based EFL contexts.

Language Learning Strategies (LLS), the cognitive and behavioral techniques learners use to acquire, store, and retrieve language information, have long been considered essential to language success [10]. These include reviewing lessons, using English media, practicing communication, or setting goals. Studies have shown strong links between strategy use and gains in vocabulary, grammar, reading, and speaking [11,12]. A recent study further examined how affordances from mentors, instructors, peers, and institutions influenced Chinese graduate students' translation motivation, illustrating how contextual resources shape motivational trajectories [13]. However, most studies treat strategies in isolation or focus on intervention outcomes without integrating predictors like motivation and SE [14]. Moreover, strategy research often fails to explain why some learners use strategies more frequently or effectively than others.

Importantly, the mediation of SE and LLS between motivation and proficiency remains insufficiently documented. Though remote learning studies in China support this mediational path [8], these focus on online education and specific domain skills, limiting generalizability. Most EFL SEM research examines motivation alone, explores SE-strategy links without the proficiency outcome, or focuses on a single language skill. Thus, the lack of comprehensive models assessing the direct and indirect effects of INM and EXM via SE and LLS on overall proficiency represents a persistent research gap.

Further, the integration of the SDT, SC, and LLS frameworks in one coherent SEM model is notably rare. Much of EFL research remains fragmented, either addressing motivation without strategies or strategies without their affective antecedents [15]. Thus, empirical research that maps the interrelationships among affective (motivation, self-efficacy), cognitive (strategies), and behavioral (proficiency) factors is urgently needed.

To address these limitations, the present study proposes and tests a hybrid SEM model in which INM and EXM (SDT) predict SE, which in turn enhances LLS. Both SE and LLS are expected to directly and indirectly affect EP across language skills. This model enables simultaneous testing of direct motivational effects, cognitive mediations, and outcome-oriented pathways within a coherent theoretical structure. The key innovation of this study lies in integrating SDT, SCT, and LLS into a single SEM framework. The study's outcomes are projected to contribute to curriculum design practices, instructional practices, and learner support strategies by highlighting the pathways through which INM and EXM shape SE, strategy use, and ultimately, proficiency. This contribution is particularly relevant for EFL learners in the Middle East, where understanding these dynamics can guide more effective language teaching interventions and promote sustained language learning success.

2. Literature Review

2.1. SDT and Its Role in Language Learning

SDT, developed by Deci and Ryan [2,16], provides an extensive theoretical framework for examining human motivation and its effects on learning, behavior, and psychological development. A core principle of SDT is the differentiation between INM and EXM, which represent qualitatively different ways individuals engage in activities. In second language acquisition, particularly EFL, SDT provides valuable insights into how motivational orientations shape learners' engagement, persistence, and eventual proficiency.

According to SDT, intrinsic motivation (INM) refers to the engagement in tasks for the inherent pleasure and fulfillment they elicit, rather than for external rewards, as in EXM [2]. Importantly, SDT further categorizes EXM from external regulation (e.g., studying for grades) to integrated regulation (e.g., internalizing the value of language learning as part of one's identity). This differentiation enables researchers to better understand how learners' motivations influence their language learning behavior and success [16]. While these classic contributions established the foundation of SDT, recent studies have extended its application in EFL contexts, showing that autonomy-supportive environments and internalized forms of motivation remain critical to sustained proficiency [17–19].

In language learning, the three core psychological needs, autonomy, competence, and relatedness, play a pivotal role in shaping motivational quality [17], directly influencing language motivation in learning [18]. Autonomy involves the feeling of desire and self-direction, which allows learners to perceive learning as aligned with their goals and interests. When supported, it can also enhance learners' motivation and well-being [19]. Competence refers to the belief in one's ability to succeed and progress. In contrast, relatedness captures the sense of belonging and connection with others, such as peers, teachers, or the target language community [16]. Thus, learners are more likely to develop INM and internalized forms of EXM, both of which support sustained learning behaviors.

Empirical studies have consistently affirmed SDT's relevance in EFL contexts. For example, [17,20] found that learners with high INM reported greater enjoyment and persistence in language study than those driven by external motives. Dörnyei [21] emphasized that INM is crucial for maintaining long-term engagement, especially in environments with limited exposure to practice the language. In Saudi Arabia and China, research by Alqahtani [22] and Li et al. [23] has shown that motivational goals centered on personal growth and communicative competence are more strongly associated with autonomy and language proficiency than purely instrumental goals like exam success or graduation requirements.

While motivations can positively affect language learning outcomes, research suggests that INM is more closely linked to deeper engagement, resilience, and self-directed strategy use [24,25]. Moreover, amotivation—or the absence of intentionality and value in learning—has been negatively correlated with language proficiency. Their findings underscore the importance of fostering motivational environments, prioritizing internalization, and personal relevance.

In the current study, SDT serves as the theoretical foundation for modelling INM and EXM as antecedent variables within the proposed SEM framework. Specifically, it is hypothesized that learners' motivational orientations influence their SE beliefs and subsequent use of LLS, ultimately contributing to self-reported EP. By integrating SDT with SCT and LLS, the study fully captures how affective, cognitive, and behavioral dimensions interact in EFL learning.

Furthermore, SDT informs pedagogical practices aimed at improving EFL instruction. For instance, autonomy-supportive teaching—such as allowing learners to choose topics, encouraging self-assessment, and promoting meaningful interaction—has been shown to enhance motivation and EP [19,26]. Designing curricula that fulfil learners' psychological needs can help sustain motivation and foster long-term achievement.

In short, SDT explains the reasons behind learners' engagement in language learning and how the quality of their motivation influences their resilience, strategy use, and language proficiency. It thus provides a critical foundation for examining the motivational components of the hybrid model proposed in this study.

2.2. Self-Efficacy

SCT, developed by [6,27], presents learning as a dynamic process shaped by the reciprocal interaction of personal factors, environmental influences, and behaviors. At the heart

of this framework is SE—a learner's belief in their capacity to perform specific tasks successfully. SE is recognized as a pivotal determinant of learners' effort, persistence, self-regulation, and ultimately, language achievement [28,29].

Bandura [27] identifies four principal sources of SE. Among these, mastery experiences—such as completing a conversation in English—are the most influential, as they build a sense of competence. Observing peers' success (vicarious experiences) and receiving encouraging feedback (verbal persuasion) contribute significantly to motivation. Managing emotions like anxiety or confidence (physiological states) also plays an important role. For EFL learners, these sources together shape how confidently they approach language tasks, how persistently they engage with challenges, and how resilient they are when faced with setbacks [28,29].

Several studies confirm that SE significantly influences language learners' engagement and performance [30–32]. For example, validated an English SE scale among South Korean learners, finding that higher levels of self-belief were associated with greater language use and classroom participation. Abdul Rahim et al. [33] found that learners possessing higher levels of SE demonstrated a greater tendency to apply metacognitive strategies, which in turn led to better writing performance. Their structural model showed that SE fully mediated the effects of motivational regulation on writing, reinforcing its role as a central psychological conduit between practical and behavioral learning dimensions.

Alzain [34], Mills et al. [35], and Sawir et al. [36] found that learners with strong SE were more likely to stay engaged in difficult tasks. These learners also tended to use effective LLS and showed higher levels of proficiency. On the other hand, those with low SE often avoid difficult communicative situations. Some even withdrew from the learning process altogether. This suggests that SE is more than a predictor of performance. It functions as a motivational filter that shapes how learners set goals, plan efforts, and track their progress [7,27,37].

Despite its well-documented importance, few models have positioned SE as a mediating variable that connects motivation (intrinsic and extrinsic) to language learning behaviors and proficiency outcomes. The present study aims to fill a crucial gap in the literature by adopting this role within a hybrid SEM framework. SE is conceptualized as a cognitive bridge that translates learners' motivational orientations into strategic language behavior and, ultimately, improved proficiency.

Furthermore, SCT supports practical interventions that can enhance SE. Teachers can design learning environments to include challenging tasks, encourage reflection on progress, facilitate peer modelling, and provide constructive feedback [34,38,39]. These classroom strategies align with SCT's emphasis on reciprocal determinism, where personal beliefs, social influences, and active behavior shape each other.

Within the present study's hybrid model, SE not only reflects learners' internal beliefs but also mediates the pathway between motivation and learning outcomes. By explicitly modelling SE, the study contributes to a more integrated understanding of how affective, cognitive, and behavioral components interact in second language acquisition.

2.3. Language Learning Strategies: Behavioral Dimension of Language Acquisition

LLS constitute the behavioral dimension of second language acquisition, enabling learners to effectively and independently manage their learning. Oxford's SILL offers one of the most widely recognized frameworks for categorizing these strategies, which are defined as deliberate actions, behaviors, procedures, or methods that learners employ to enhance their learning effectiveness [10,40]. The SILL classifies LLS into six main categories, each playing a unique role in the acquisition and application of English language skills. Although Oxford's taxonomy remains the cornerstone, more recent studies demonstrate how strategy use has adapted to digital learning environments and learner characteristics, confirming the framework's ongoing relevance [41,49].

Memory strategies facilitate storing and retrieving language information, while cognitive strategies involve mental manipulation of language, such as summarizing and analyzing. Compensation strategies help learners overcome knowledge gaps. Metacognitive strategies include planning, monitoring, and assessing one's learning, aligning with principles of self-regulation. Affective strategies focus on emotion regulation, and social strategies involve interpersonal communication such as asking questions or cooperating with peers [10,40].

Empirical research has consistently demonstrated that frequent and diverse strategy use correlates positively with language proficiency. Learners who employ metacognitive, compensation, and cognitive strategies tend to outperform those who rely minimally on strategic behaviors [11,12,41]. For instance, Szyszka [11] highlighted how learners who used phonological repetition and audio-visual feedback improved their speaking performance. Compensation and metacognitive strategies were strong predictors of proficiency in reading and speaking [42,43].

The SILL also reveals variation in strategy use based on learner characteristics. Research shows that EFL learners tend to rely most frequently on metacognitive and compensation strategies, whereas memory and affective strategies are employed to a much lesser extent [44,45]. Factors such as proficiency level, gender, and digital fluency influence strategy adoption [46–48]. For example, higher proficiency learners use strategies more frequently and flexibly [41], while digitally fluent students are more likely to integrate online tools into their language learning [49,50].

Despite these findings, much of the literature on LLS is descriptive, focusing on frequency and type rather than explanatory models. Comprehensive, theory-driven approaches that integrate LLS with psychological antecedents such as motivation and SE remain underdeveloped [14,51]. Addressing this gap, the present study conceptualizes LLS not as an isolated variable, but as a mediating mechanism linking affective (motivation) and cognitive (SE) constructs to actual proficiency outcomes.

SE influences learners' use of metacognitive, cognitive, social, and other strategies, highlighting its predictive role in effective language learning [52]. It can further enhance learners' confidence, proficiency, and autonomy [53]. Specifically, learners with high SE are more inclined to employ a range of learning strategies [9,28], while those with higher INM may employ strategies proactively as a means of self-directed engagement. This reflects the interdependence between learners' internal beliefs and their observable learning behaviors—an idea consistent with both Bandura's [27] SCT and Deci & Ryan's SDT [16]. Moreover, instruction in strategy use has been shown to enhance learner confidence and language outcomes, suggesting the value of incorporating LLS training into EFL pedagogy [40,54]. The SILL contributes to understanding how behavioral strategies mediate the path from affective and cognitive constructs to proficiency in this hybrid framework. By modelling LLS as a mediating behavioral mechanism, this study contributes a nuanced perspective of the dynamic processes that lead to successful English language acquisition in EFL contexts.

The above literature underscores INM/EXM, SE, and LLS as key determinants of EP. Self-Determination Theory explains how INM and EXM drive engagement. SCT positions SE as essential for persistence and goal achievement, and Oxford's framework highlights how strategic behaviors support effective language learning. However, much of the existing research has explored these constructs in isolation or through simple correlational analyses, leaving a gap in understanding how these affective, cognitive, and behavioral factors interact as part of a dynamic process leading to proficiency gains. This study addresses this gap by developing and empirically testing a hybrid SEM that integrates these theoretical frameworks. It offers more profound insight into how motivation translates into effective strategy use and improved language proficiency. Building on this foundation, the following section outlines the conceptual framework and hypotheses of the study.

2.4. Study Model: Conceptual Framework and Hypothesized SEM Model

Building on the integration of SDT, SCT, and LLS, the current study proposes a comprehensive hybrid conceptual framework that captures the affective, cognitive, and behavioral dimensions of learning among EFL students. The model is designed to explain how learners' motivational orientations (INM/EXM) influence their beliefs (SE), behavioral strategies (LLS), and ultimately, their English language proficiency. **Table 1** presents the proposed model structure, outlining the key variables, their operational definitions, and the theoretical frameworks underpinning their inclusion in the study's conceptual model.

Figure 1 illustrates the hypothesized SEM, depicting the relationships through INM/EXM, SE, LLS, and English language proficiency.

Table 1. Study Variables, Definitions, and Theoretical Sources.

Variable		Definition	Source
Independent Variables	INM	Learning driven by internal interest, curiosity, and enjoyment.	SDT
	EXM	Learning driven by external goals such as career advancement, grades, or recognition.	SDT
Mediating Variables	SE	Learners' belief in their ability to use English in academic and real-life tasks.	SCT
	LLS	Learner-reported use of LLS	SILL
Dependent Variable	EP	Self-reported competence in listening, speaking, reading, and writing.	Combined (SDT, SCT, SILL)

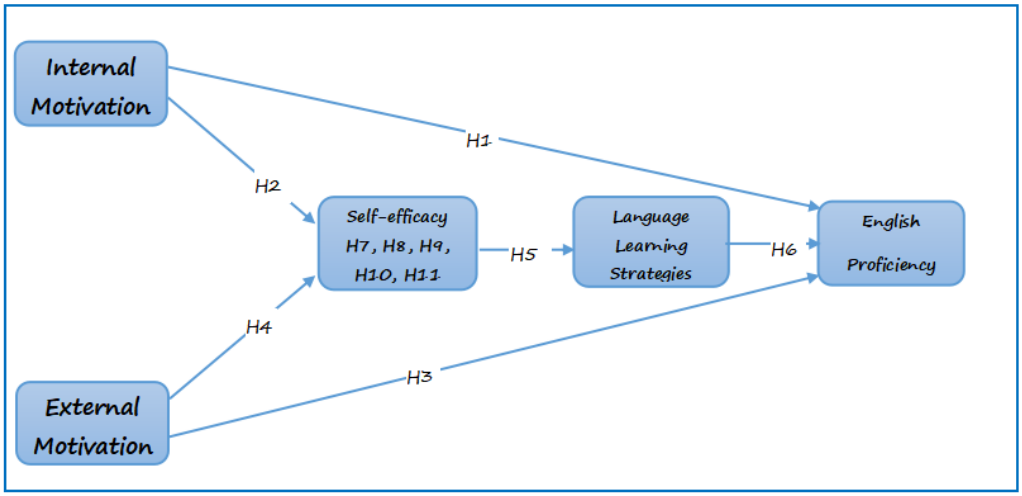

Figure 1. Hypothesized Hybrid SEM Model for English Proficiency.

As outlined in **Table 1**, INM and EXM (SDT) are positioned as the independent variables, shaping learners' self-efficacy (SCT), which influences their LLS and their EP. This integrated conceptualization, visually presented in **Figure 1**, forms the basis for the following hypotheses, which test the direct and mediated pathways among these constructs.

Hypotheses of the Model

Direct Effects:

H1. *Intrinsic motivation has a positive and significant effect on English language proficiency.*

H2. *Intrinsic motivation has a positive and significant effect on self-efficacy.*

H3. *Extrinsic motivation has a positive and significant effect on English language proficiency.*

H4. *Extrinsic motivation has a positive and significant effect on self-efficacy.*

H5. *Self-efficacy has a positive and significant effect on language learning strategies.*

H6. *Language learning strategies have a positive and significant effect on English language proficiency.*

Indirect and Sequential Mediation Effects

H7. *Self-efficacy has a positive and significant indirect effect on English language proficiency through language learning strategies.*

H8. *Intrinsic motivation has a positive and significant indirect effect on language learning strategies through self-efficacy.*

H9. *Intrinsic motivation has a positive and significant sequential indirect effect on English language proficiency through self-efficacy and language learning strategies.*

H10. *Extrinsic motivation has a positive and significant indirect effect on language learning strategies through self-*

efficacy.

H11. *Extrinsic motivation has a positive and significant sequential indirect effect on English language proficiency through self-efficacy and language learning strategies.*

3. Methodology

3.1. Research Design

This study employed a quantitative, cross-sectional research design to examine the structural relationships among INM, EXM, SE, LLS, and EP in the EFL context. Guided by SDT[3], SCT[6], and Oxford's[10] SILL, the study utilized SEM to test the hypothesized relationships among the constructs.

3.2. Instruments

Data were collected through an online questionnaire created using Google Forms. This study employed validated and adapted instruments covering motivational, cognitive, behavioral, and outcome variables. These instruments were selected based on their established reliability and relevance in EFL research and were adapted to suit the study's context. Motivation was measured using adapted items from Noels et al.[3] and Gardner[55]. Five items each were used to measure intrinsic (e.g., "I enjoy learning English because it is fun") and EXM (e.g., "I study English because I want to get a good job"). SE beliefs were assessed using a 5-item scale adapted from Wang et al.[30], focusing on learners' confidence in performing language tasks. Sample items include: "I can express my ideas clearly in written English."

LLS were measured with six selected items from Oxford's[10] SILL, covering metacognitive, cognitive, compensation, and social strategies (e.g., "I use English websites, videos, or apps to improve my language skills," "I set learning goals and monitor my progress in learning English"). The number of items was reduced to minimize participant burden and ensure higher response quality while retaining coverage of the key strategy domains. This adapted version maintained strong psychometric support, consistent with findings in previous studies[12,41].

Proficiency was assessed through a self-reported scale measuring competencies in language skills (e.g., "I can write essays or reports clearly in English," "I can understand most spoken English in lectures"). The scale, aligned with CEFR descriptors, included eight items providing a holistic measure of self-perceived English competence. This adaptation has been widely used in EFL contexts, demonstrating strong reliability and construct validity in previous research[9,36]. The questionnaire was reviewed by an expert in applied linguistics for content validity and piloted with 30 students. Cronbach's alpha values for the pilot study ranged from 0.725 to 0.901 across all scales, indicating satisfactory internal consistency[56,57]. During the full dataset analysis, two items were removed due to low item–total correlations (<0.60): item four from the SE scale and item five from the LLS scale. These deletions improved the overall reliability of the respective scales. The final analysis was conducted on the refined scales.

3.3. Participants

A total of 303 EFL learners participated in this study. The sample was collected using Google Forms and included undergraduate EFL learners enrolled at universities in Saudi Arabia and Yemen. Participants represented a range of academic levels and fields of study. A convenience sampling technique was used because it allowed for efficient access to a large and diverse group of respondents across multiple universities, which is particularly practical in cross-country research involving online data collection[58]. However, this non-probability sampling method may limit the generalizability of the findings. Despite this limitation, the sample size exceeds the minimum recommended threshold for SEM, which typically requires at least 200 cases for stable estimates.

The questionnaire link was distributed through colleagues at multiple universities, who circulated it among their students. At the outset of the survey, participants were informed that their participation was voluntary and anonymous, with no obligation to complete the questionnaire. An informed consent statement clarified the study's purpose, confidentiality safeguards, and participants' right to withdraw at any stage of the survey. The inclusion criteria required participants to be undergraduate EFL learners enrolled at universities in Saudi Arabia and Yemen. No additional exclusion criteria were imposed, as proficiency was assessed through self-reported scales rather than external testing.

4. Analysis and Findings

4.1. Demographic Information

Data were collected from undergraduate students enrolled in various universities across the Kingdom of Saudi Arabia and Yemen. The final sample consisted of 303 participants, comprising 57.6% males and 42.4% females. In terms of age distribution, 48.1% of the respondents were between 17 and 20 years old, 32.3% were between 21 and 24, and 19.6% were between 25 and 30. This distribution reflects a diverse demographic profile, offering groups that are well-suited for examining the relationships among motivation, SE, LLS, and English language proficiency within the study's conceptual framework.

4.2. Analysis Related to the Measurement Model of the Study

The measurement model was validated through Confirmatory Factor Analysis (CFA), which confirmed acceptable reliability and validity of the constructs. During the evaluation, one item from the SE scale (Item 4) and one from the LLS scale (Item 5) were removed due to loadings below 0.60, thereby improving the model's fitness and internal consistency. All retained items demonstrated standardized loadings above the recommended threshold of 0.60, supporting indicator reliability. The outer loadings in **Table 2** demonstrate that most items exceeded the recommended threshold of 0.60 [59], indicating acceptable indicator reliability. Items with loadings above 0.70 (e.g., EP3 = 0.820; LLS2 = 0.850; SE3 = 0.838) suggest that these indicators are strong measures of their respective latent constructs. Only a few indicators, such as EXM2 (0.608) and INM3 (0.650), fell slightly below the ideal cut-off yet remained above the minimum acceptable threshold for exploratory studies [60]. The VIF values ranged between 1.14 and 2.83, all well below the critical value of 5.0, confirming the absence of problematic multicollinearity.

Table 3 shows that Cronbach's alpha and CR values met or exceeded the 0.70 benchmark for most constructs, indicating internal consistency. The AVE values for EP (0.623), LLS (0.558), and SE (0.660) exceeded the recommended 0.50 threshold, supporting convergent validity. However, EXM (AVE = 0.425) and INM (AVE = 0.481) fell slightly below this threshold, a result not uncommon in motivation research [3] where heterogeneous item content may capture broader aspects of the construct.

In **Table 4**, discriminant validity was confirmed, as each construct's AVE square root exceeded its correlations with other constructs. Thus, this satisfied the requirement for distinctiveness among latent variables. This supports the conceptual separation between motivational, cognitive, and behavioral constructs in the proposed hybrid model integrating SDT, SCT, and SILL.

Table 2. Outer Loadings.

Outer Loadings	PE	EXM	INM	LLS	ES	VIF
EP1	0.707					1.821
EP2	0.780					2.032
EP3	0.820					2.417
EP4	0.849					2.829
EP5	0.704					1.783
EP6	0.836					2.746
EP7	0.788					2.320
EP8	0.818					2.416
EXM1		0.678				1.426
EXM2		0.608				1.149
EXM3		0.608				1.195
EXM4		0.622				1.190
EXM5		0.733				1.391
INM1			0.683			1.410
INM2			0.712			1.528
INM3			0.650			1.464
INM4			0.738			1.235
INM5			0.681			1.562

Table 2. *Cont.*

Outer Loadings	PE	EXM	INM	LLS	ES	VIF
LLS1				0.687		1.468
LLS2				0.850		2.143
LLS3				0.721		1.399
LLS4				0.657		1.472
LLS6				0.802		2.122
SE1					0.821	1.892
SE2					0.799	1.784
SE3					0.838	2.024
SE5					0.791	1.519

Table 3. Reliability and Validity.

	Cronbach's Alpha	Composite Reliability (a)	Composite Reliability (c)	AVE
EP	0.913	0.915	0.929	0.623
EXM	0.715	0.723	0.791	0.425
INM	0.742	0.766	0.822	0.481
LLS	0.803	0.824	0.862	0.558
SE	0.829	0.832	0.886	0.660

Table 4. Discriminant Validity: Farnell-Larcker Criterion.

	EP	EXM	INM	LLS	SE
EP	0.789				
EXM	0.282	0.652			
INM	0.478	0.541	0.693		
LLS	0.623	0.407	0.534	0.747	
SE	0.796	0.358	0.568	0.676	0.812

4.3. Structural Model

The structural model was then assessed to examine the hypothesized relationships among motivation, SE, strategy use, and proficiency. **Table 4** presents the results, indicating both supported and unsupported pathways. **Figure 2** also provides a visual illustration of these relationships.

The hypotheses testing results (**Table 5**) reveal that INM had a significant positive effect on EP ($\beta = 0.228$, $p = 0.003$) and SE ($\beta = 0.530$, $p < 0.001$), supporting H1 (INM -> EP) and H2 (INM -> SE), and aligning with SDT's prediction that autonomous forms of motivation enhance both perceived competence and performance outcomes. In contrast, EXM did not significantly predict either proficiency ($\beta = –0.054$, $p = 0.407$) or SE ($\beta = 0.071$, $p = 0.310$), providing no support for the corresponding hypotheses, H3 (EXM -> EP) and H4 (EXM -> SE). This aligns with prior research suggesting that controlled forms of motivation may have weaker or inconsistent effects in EFL contexts.

Table 5. Hypotheses Testing.

Hypotheses	Std. Beta	Std. Error	t-Statistic	*p* Values	2.5% CI LL	97.5% CI UL	Inference
INM -> EP	0.228	0.077	2.974	0.003	0.075	0.378	Supported
INM -> SE	0.530	0.058	9.071	0.000	0.418	0.650	Supported
EXM -> EP	−0.054	0.065	0.829	0.407	−0.172	0.081	Not Supported
EXM -> SE	0.071	0.070	1.015	0.310	−0.058	0.213	Not Supported
SE -> LLS	0.676	0.035	19.511	0.000	0.610	0.746	Supported
LLS -> EP	0.523	0.053	9.820	0.000	0.418	0.629	Supported
SE -> LLS -> EP	0.354	0.050	7.062	0.000	0.262	0.461	Supported
INM -> SE -> LLS	0.358	0.044	8.055	0.000	0.279	0.453	Supported
INM -> SE -> LLS -> EP	0.187	0.033	5.601	0.000	0.130	0.261	Supported
EXM -> SE -> LLS	0.048	0.048	0.994	0.320	−0.038	0.149	Not Supported
EXM -> SE -> LLS -> EP	0.025	0.026	0.963	0.336	−0.019	0.082	Not Supported

SE appeared as a strong predictor of LLS ($\beta = 0.676$, $p < 0.001$), supporting H5 (SE -> LLS) and reflecting SCT's assertion that confidence in one's ability facilitates the adoption of effective strategies. In turn, LLS use significantly predicted EP ($\beta = 0.523$, $p < 0.001$), supporting H6 (LLS -> EP) and reinforcing Oxford's[10] proposition that strategic engagement directly contributes to language outcomes.

The mediation and serial mediation analyses offered further insight into the mechanisms linking motivation (INM & EXM), SE, LLS, and EP. The pathway SE → LLS → EP was significant ($\beta = 0.354$, $p < 0.001$), supporting H7. This indicates that confident learners rely on their beliefs and translate them into concrete strategic behaviors that subsequently enhance EP. H8 (INM → SE → LLS) was also supported ($\beta = 0.358$, $p < 0.001$), revealing that INM positively influences LLS use through the mediating role of SE. In line with H9 (INM → SE → LLS → EP), this sequential pathway was confirmed ($\beta = 0.187$, $p < 0.001$), suggesting that intrinsically motivated learners develop higher SE, which promotes greater LLS use, leading to improved EP. In contrast, H10 (EXM → SE → LLS) and H11 (EXM → SE → LLS → EP) were not supported, indicating that EXM fails to produce similar mediational or sequential effects. These results reinforce the proposition that autonomous forms of motivation, rather than controlled ones, are the primary drivers of self-belief, strategic engagement, and language achievement.

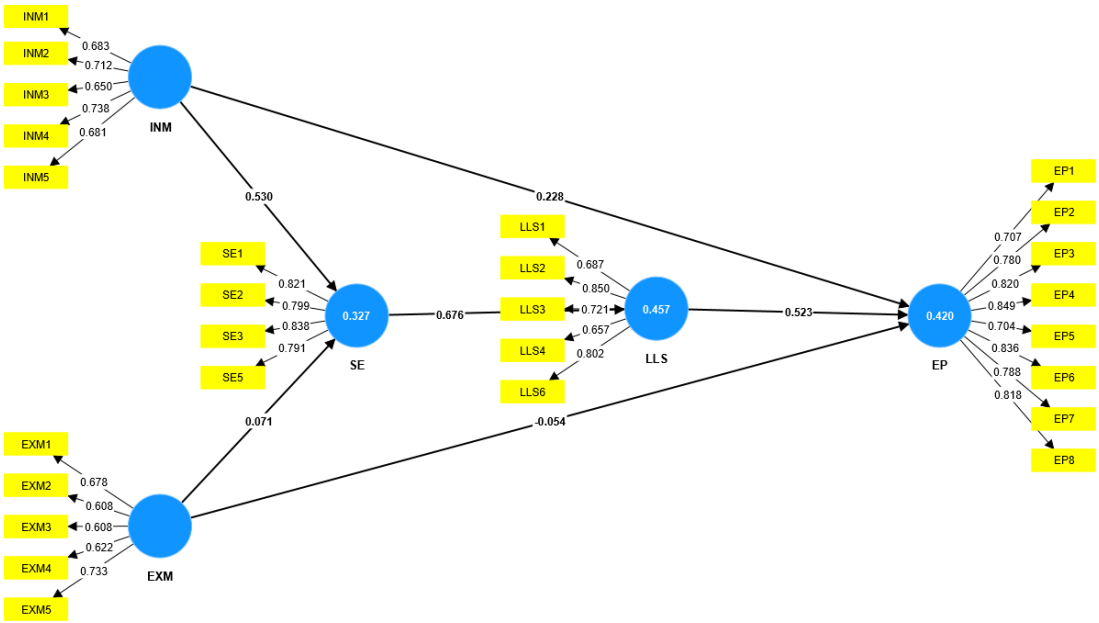

Figure 2. The path coefficients.

4.4. Variance and Effect Sizes

To assess the predictive capacity of the proposed SEM model, the explained variance (R^2) for each endogenous construct and the effect sizes (f^2) of the structural paths were examined. R^2 values provide an indication of the proportion of variance accounted for by the model, while f^2 values capture the magnitude of the contribution of each predictor to the respective endogenous variable. These indicators offer a nuanced perspective of the model's explanatory strength and the relative importance of individual paths in shaping English language proficiency, SE, and strategy use.

The model explained 42% of the variance in EP, 45.7% in strategy use, and 32.7% in SE (**Table 6**), indicating substantial explanatory power for a behavioral model in applied linguistics[61]. Effect size results (**Table 7**) revealed that SE had a substantial effect on LLS ($f^2 = 0.842$) and that LLS had a substantial effect on proficiency ($f^2 = 0.328$). INM had a moderate effect on SE ($f^2 = 0.295$), whereas the effects of EXM were negligible across outcomes.

Table 6. Coefficient of determination (R^2).

	R-Square	R-Square Adjusted
EP	0.420	0.414
LLS	0.457	0.455
SE	0.327	0.322

Table 7. Effect size (f^2).

	f-Square
INM -> EP	0.053
INM -> SE	0.295
EXM -> EP	0.003
EXM -> SE	0.005
LLS -> EP	0.328
SE -> LLS	0.842

5. Discussion

The present study sought to model the interrelationships among INM and EXM, SE, LLS, and EP in EFL contexts, integrating SDT[2], SCT[6], and LLS[10] frameworks into a single structural equation model. The findings provide strong empirical support for a motivational–cognitive–behavioral pathway in which INM promotes SE, which enhances strategy use, and strategy use, in turn, drives proficiency gains.

The direct link between INM and proficiency (H1) reinforces the proposition that autonomous forms of motivation yield deeper engagement and sustained learning outcomes[3,21]. This relationship was complemented by a robust effect of INM on SE (H2), aligning with Bandura's[27] contention that motivational quality strengthens perceived competence. Learners motivated by personal interest appear more likely to develop the confidence necessary to persist in challenging tasks—an effect that cascades into greater strategic engagement and, ultimately, improved proficiency.

In contrast, EXM demonstrated no significant effect on either proficiency (H3) or SE (H4). This finding diverges from studies reporting short-term benefits of extrinsic incentives[20] but is consistent with evidence that controlled motivation fails to sustain long-term language gains[24]. Within the cultural and educational contexts examined, reliance on external rewards may not translate into the autonomous regulation required for consistent strategy use or skill mastery.

The results strongly supported the hypothesized cognitive–behavioral linkages. SE was a powerful predictor of LLS use (H5), confirming that confident learners are more likely to plan, monitor, and adjust their learning[7,8]. Moreover, LLS directly predicted proficiency (H6), echoing decades of research demonstrating that strategic learning behaviors, such as metacognitive planning, cognitive rehearsal, and compensation techniques, are associated with improved performance across all four language skills[11,40].

The mediation analysis uncovers critical subtleties in the relationships among variables. SE's effect on proficiency was partially mediated by LLS (H7), suggesting that belief in one's capabilities is necessary but insufficient; its benefits materialize when channeled through deliberate strategy use. Similarly, the sequential pathways from INM to proficiency via SE and LLS (H8, H9) underscore the layered nature of language learning. INM bolsters confidence, which in turn encourages strategy deployment and ultimately leads to higher proficiency. These findings extend the work of Teng and Wu[8] by confirming the serial mediation pathway in EFL contexts.

By contrast, EXM's mediation and serial mediation effects (H10, H11) were insignificant, further illustrating external drivers' limited role in fostering the self-regulated behaviors essential for sustained language development. This pattern aligns with SDT's prediction that externally regulated behaviors lack the depth of processing and persistence needed for complex skill acquisition.

Overall, the model explained 42% of the variance in proficiency, 45.7% in LLS, and 32.7% in SE, surpassing thresholds for substantial explanatory power[61] and highlighting the practical utility of the integrated theoretical approach. The significant effect of SE on LLS ($f^2 = 0.842$) and the substantial impact of LLS on proficiency ($f^2 = 0.328$) further confirm that effective language learning is driven not solely by motivation but by the interplay between cognitive confidence and strategic action.

Taken together, these findings position INM, SE, and LLS as central levers in EFL proficiency development. They also address a noted gap in the literature by empirically validating the combined application of SDT, SCT, and LLS theory in a Middle Eastern EFL context, thereby providing a more holistic account of how psychological and behavioral factors interact to shape language learning success.

6. Implications

6.1. Theoretical Implications

The present study offers several contributions to the theoretical understanding of EFL learning processes. First, it empirically validates an integrated framework combining SDT, SCT, and the LLS model. It demonstrates that the pathway from motivation to proficiency functions through SE

and strategy use in a sequential, mediating process. While previous studies examined these constructs in isolation, the model of this study captures their interdependence. This provides a more holistic account of how affective, cognitive, and behavioral factors interact in language acquisition.

Second, the findings substantiate SDT's proposition that INM is a more enduring and effective learning driver than EXM. This is especially true in contexts where sustained effort and self-regulation are required. The negligible direct and indirect effects of EXM reinforce the need to distinguish between controlled and autonomous forms of motivation in theoretical models of L2 learning.

Third, the results extend SCT's conceptualization of SE by demonstrating its dual role: as a direct enabler of strategic engagement and an intermediary directing motivational quality into effective learning behaviors. The exceptionally noticeable effect size of SE on LLS provides robust evidence for its centrality in EFL contexts. It suggests that any theoretical account of language learning that omits this construct risks underestimating key behavioral outcomes.

Finally, the study contributes to strategy-based language learning theory by confirming that strategy use is not merely a product of cognitive skill but is strongly shaped by learners' motivational and self-belief profiles. This reinforces Oxford's[10] argument that strategies bridge cognitive readiness and actual performance.

6.2. Practical Implications

The findings hold clear implications for curriculum design and instructional practice in EFL contexts. First, the strong influence of INM suggests that teachers and curriculum developers should prioritize activities that enhance learners' autonomy, competence, and relatedness. This can be achieved through tasks that offer meaningful choices, authentic opportunities for communication, and feedback that prioritize personal growth rather than external evaluation.

Second, the central role of SE highlights the importance of building learners' confidence through scaffolded instruction, progressive goal setting, and mastery-oriented feedback. Teacher training programmers should incorporate strategies for modelling successful language behaviors, celebrating incremental progress, and reframing errors as opportunities for learning.

Third, given the substantial effect of LLS on EP, explicit strategy instruction should be embedded into EFL courses. This includes training learners to plan their study sessions, monitor progress, use cognitive rehearsal techniques, and leverage supplementary resources such as dictionaries, peer interaction, or digital tools. Therefore, strategy instruction should be personalized to match learners' proficiency levels and learning preferences.

Finally, the negligible impact of EXM suggests that reward-based or test-driven approaches may have limited long-term benefits. Policymakers and institutions should therefore reconsider over-reliance on high-stakes assessments as primary motivators, and instead foster learning environments where internalized value and personal meaning drive sustained engagement.

7. Conclusions

This study empirically validates an integrated SEM model linking motivation, SE, LLS, and proficiency among EFL learners in Saudi Arabia and Yemen. Drawing on SDT, SCT, and LLS, the findings reveal that INM, rather than EXM, is the primary affective driver of proficiency. The substantial effect of SE on LLS and the role of LLS in predicting proficiency highlight the need to build learners' confidence and provide practical strategies for language success. The novelty of this research lies in its integrated SEM model, which unites three major theoretical traditions and captures the interplay between affective, cognitive, and behavioral dimensions, moving beyond fragmented approaches in prior studies. In practical terms, the results call for learning environments prioritizing autonomy-supportive pedagogy, confidence-building interventions, and personalized strategy training while avoiding overreliance on extrinsic rewards and high-stakes testing as primary motivators.

Despite these contributions, several limitations must be acknowledged. The cross-sectional design restricts causal inference, and the reliance on self-reported measures may introduce bias. Moreover, while the sample was diverse within Saudi Arabia and Yemen, it does not capture broader cultural or educational contexts.

Future research should therefore employ longitudinal or experimental designs to establish causal pathways and incorporate objective proficiency measures. Additional me-

diators, such as learner engagement or digital literacy, also warrant exploration. Finally, cross-contextual studies are recommended to test the generalizability of the model across diverse EFL environments.

Overall, this research provides a robust and theoretically grounded explanation of how motivation shapes language proficiency through the twin mediators, SE and strategy use. Bridging established theories into a single explanatory model offers a blueprint for scholars and practitioners seeking to optimize language learning outcomes in varied EFL contexts.

Author Contributions

Conceptualization, E.A. and F.A.; methodology, E.A. and F.A.; validation, E.A.; formal analysis, F.A.; writing—original draft, F.A.; writing—review and editing, E.A.; visualization, F.A.; supervision, E.A.; project administration, E.A.; funding acquisition, E.A. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Informed consent was obtained electronically from all participants prior to data collection. The consent form explained the purpose of the study, assured participants of anonymity and confidentiality, and informed them of their right to withdraw at any stage of the survey. Participation was voluntary, and no personally identifying information was collected.

Data Availability Statement

Data can be given upon a reasonable request.

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Conflicts of Interest

The authors declare no conflict of interest.

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