



Basic Psychological Needs, Autonomous Single Language Interest, and Vocabulary Achievement: An Integrated Model

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Abstract

Psychological factors such as metacognition have been consistently reported as key variables in this regard. Guided by Self-determination theory (SDT) as well as L2 grit, a new concept was developed referred to as autonomous single language interest (ASLI). It emphasizes the singular long-term interest in learning the L2 until it is achieved. The present article reports on the effect of ASLI on the attainment of L2 Arabic vocabulary. As the literature emphasizes the importance of students' self-perceptions of their three basic psychological needs (BPN) of autonomy, competence, and relatedness, they were hypothesized to be antecedents of ASLI. Thus, an integrated model (i.e., BPN → ASLI → L2 vocabulary achievement) was hypothesized. Data were collected from 259 international students enrolled in the Department of Arabic at different universities in Saudi Arabia. Using structural equation modeling (SEM), the results highlighted ASLI as the key mediating mechanism: students' self-perceptions of the three BPN were significantly associated with ASLI, and ASLI, in turn, was positively related to higher vocabulary achievement. Accordingly, effects of BPN on vocabulary achievement were fully mediated through ASLI, with no evidence

of direct effects. This highlights the central role of ASLI in explaining the association between BPN and L2 vocabulary achievement.

Keywords: self-determination theory, grit, basic psychological needs (BPN), autonomous single language interest (ASLI), structural equation modeling (SEM), Bayesian SEM, Arabic language

Introduction

Investigating the psychological characteristics of second language (L2) learners continues to be a productive area of research with significant practical implications for language education (Griffiths & Soruç, 2020; Li et al., 2022; Pawlak, 2021). The process of learning an L2 is a long-term commitment, often requiring months or even years of sustained effort to achieve proficiency (Sparks & Alamer, 2023). Within this context, a novel concept, autonomous single language interest (ASLI), has been recently introduced (Alamer, 2022b; Alamer & Almaghlouth, 2024). ASLI pertains to the long-term dedication of language learners and the way this commitment is internalized. The core idea is that learners who possess a single, autonomously chosen goal to achieve language proficiency during their period of study are more likely to succeed than those with a less focused goal or those who are externally driven to learn.

It is rooted in the common observation by educators that students often cite being “too busy” to practice the L2 (Alamer, 2022b). Success in language learning, therefore, requires channeling energy into “one thing” at a time rather than dissipating it across multiple competing projects. According to this theory, students with multiple competing goals or those whose motivation stems from pressures or external rewards would not be classified as having high ASLI. The theory posits that a clearly articulated and internalized ASLI is one of the predictors of future L2 attainment (Alamer, 2022b). This concept aims to fill a gap in the educational psychology literature, particularly by refining the idea of “consistency of interests” from grit theory (Duckworth et al., 2007) and integrating principles from Self-Determination Theory (SDT), which emphasizes the internalization of the learning goals (Ryan & Deci, 2020). However, as ASLI is a nascent theory, further empirical investigation is necessary to fully understand its role in language learning outcomes. This study, therefore, extends this line of inquiry by examining how the three basic psychological needs—autonomy, competence, and relatedness—act as precursors to ASLI and subsequent L2 vocabulary achievement among L2 students of Arabic.

Literature Review

What is ASLI?

The concept of autonomous single language interest (ASLI) originates from practical observations within L2 learning environments (Alamer, 2022b), and its role and practical operationalization have been further clarified in a recent study by Alamer and

Almaghlouth (2024). ASLI refers to the singular focus on language learning until it is achieved and the way this commitment is internalized. It is helpful to visualize this as an allocation of energy (see Figure 1): whereas a student with multiple projects (e.g., Projects 1, 2, 3, and 4) divides their energy and reduces the likelihood of mastery in any single area, a student with ASLI directs that same energy toward a single project (language learning), thereby increasing the probability of success.

Crucially, this does not mean the learner must “only” do language learning forever, nor does it preclude them from having hobbies. Rather, it implies that during the critical phase of language acquisition, other heavy long-term commitments are minimized. The construct is rooted in the common observation by educators that while many students begin their language studies in the university with genuine enthusiasm, their focus can be changed over time. Some students may develop competing interests, such as engaging in demanding hobbies, managing businesses, or pursuing other academic subjects simultaneously. It is proposed that this diffusion of attention across multiple long-term goals can impede the attainment of mastery in any single area, particularly in language acquisition. This notion, while intuitive, has not been extensively explored in prior research and stands in contrast to some psychological theories that view having multiple long-term interests as normal, specifically grit theory (Duckworth et al., 2007).

Recent research provides further evidence for the importance of ASLI. In a longitudinal study, Alamer and Almaghlouth (2024) found that the stability of ASLI was a significant predictor of increased L2 vocabulary achievement over time. Their findings, using a latent growth curve model, demonstrated that students who began their studies with a high level of ASLI and maintained it were more likely to succeed. Fluctuations in ASLI, however, did not predict vocabulary gains, reinforcing the idea that a stable, focused, and autonomous interest is crucial for long-term L2 success.

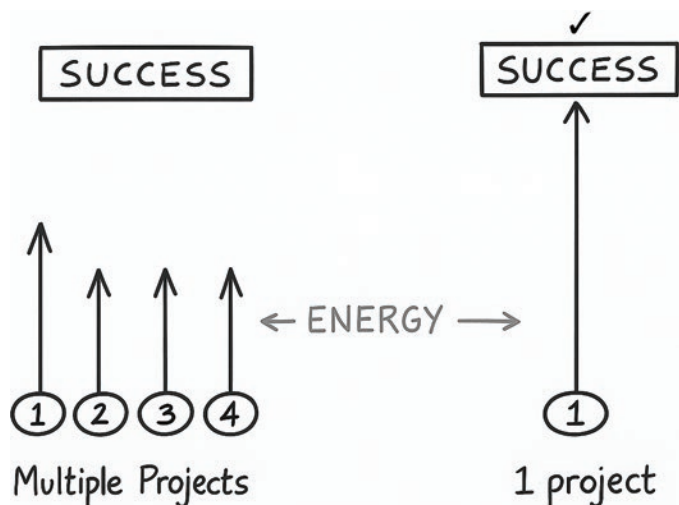


Figure 1 Visual Representation of ASLI as Focused Energy Allocation Compared to Multiple Projects.

ASLI and Consistency of Interest

A primary motivation for developing the ASLI construct was to resolve an issue within grit theory, specifically concerning the “consistency of interest” (CI) dimension. Grit is characterized as the capacity to sustain passion and perseverance toward long-term goals (Duckworth et al., 2007), and it is composed of two factors: perseverance of effort (PE) and CI. CI is defined as the ability to maintain a consistent passion for a goal over an extended period, despite challenges (Duckworth & Quinn, 2009).

However, the CI component has faced empirical challenges. Its conceptualization has been criticized for ambiguity and overlap with other personality traits like conscientiousness (Khajavy & Aghaee, 2022). Furthermore, its predictive power for L2 achievement has been inconsistent. For example, Alamer (2021) found CI to be a weak predictor of vocabulary acquisition. Other studies have reported non-significant (Elahi Shirvan & Alamer, 2024) or even negative (Sudina et al., 2020) relationships between CI and L2 proficiency.

ASLI addresses this gap by refining the concept of CI. Whereas traditional grit theory allows for the pursuit of multiple long-term goals (Duckworth, 2016), ASLI introduces a critical specification: the importance of focusing on one primary interest over a sustained period. The core contribution of ASLI is its proposition that a learner should concentrate on achieving a single long-term objective (i.e., L2 proficiency) at a time before pursuing others.

ASLI and Self-determination Theory

ASLI also incorporates principles from SDT, which provides a comprehensive framework for understanding human motivation (Deci & Ryan, 1985; Ryan & Deci, 2020). SDT distinguishes between autonomous and controlled forms of motivation. Autonomous motivation, which is central to ASLI, originates from within the individual. Noels (2023) explains that autonomous motivation includes intrinsic motivation (engaging in an activity because it is inherently enjoyable) and identified regulation (engaging in an activity because it is personally valued and important). The positive relationship between autonomous motivation and L2 achievement is well-established in the literature, a conclusion strongly reinforced by a recent comprehensive multilevel meta-analysis by Alamer, Saeedy et al. (2025) which synthesized findings across 21 studies and found that autonomous motivation was positively associated with L2 achievement but negatively with ill-being. Additionally, the importance of autonomous motivation was assessed in longitudinal (e.g., Alamer & Alrabai, 2023; Noels et al., 2019; Oga-Baldwin et al., 2017) as well as experimental studies (Alamer, Al Sultan et al., 2025).

ASLI builds on this by emphasizing that the single, long-term interest in language learning must be autonomously formulated. It is not enough to simply have a single focus; that focus must be driven by internal value rather than external pressure. A learner might have a singular goal of mastering a language, but if this goal is driven by pressures or the desire for extrinsic rewards, it does not align with the principles of ASLI. For ASLI to be properly operationalized and lead to healthy outcomes, the interest must be internalized and self-determined.

Basic Psychological Needs as Antecedents

A central tenet of SDT is the satisfaction of three innate and universal basic psychological needs: autonomy (the need to feel a sense of choice and volition), competence (the need to feel effective and capable), and relatedness (the need to feel connected to and cared for by others). According to SDT, the satisfaction of these needs is essential for fostering autonomous motivation and overall well-being (Noels et al., 2019; Ryan & Deci, 2017). When learners feel their needs for autonomy, competence, and relatedness are supported within the learning environment, they are more likely to develop the high-quality, autonomous motivation that is a cornerstone of ASLI (Alamer & Al Fraidan, 2025; Hajovsky et al., 2019). And when these needs are thwarted, intrinsic motivation and language achievement are expected to decrease (Alharfi & Alamer, 2025; Fernández Ortega et al., 2024). As recently confirmed in an intervention study, young L2 students exhibited reduced enjoyment, continuous learning, and performance when their autonomous motivation was controlled by an external reward system (Alamer, Al Sultan et al., 2025).

Furthermore, the role of the learning environment in fostering these psychological states is critical. A study by Alamer and Al Fraidan (2025) investigated how students' perceptions of teacher support for the three BPN influenced their intention to withdraw from an L2 course. The results showed that perceived teacher support for autonomy and relatedness significantly decreased students' intentions to withdraw. This highlights that when teachers create an environment that respects students' volition and fosters a sense of connection, students are more likely to persist. These findings shed light on the concept of ASLI, particularly its emphasis on long-term persistence and commitment, rather than withdrawal.

Collectively, these studies underscore the interconnectedness of the learning environment, the satisfaction of basic psychological needs, and the development of a stable, autonomous interest like ASLI. Therefore, it is hypothesized that the fulfillment of the three basic needs serves as a direct antecedent to the development of ASLI, which in turn relates to higher L2 vocabulary achievement. This study seeks to test an integrated model where BPN satisfaction predicts ASLI, and ASLI mediates the relationship between BPN and vocabulary knowledge.

The research question of the present article is as follows:

RQ: What is the relationship between basic psychological needs, autonomous single language interest and L2 Arabic vocabulary achievement?

Based on the literature, the hypothesized model was formulated and presented in Figure 2.

Methods

Research Context and Participants

In this study, a larger sample of learners from various universities in Saudi Arabia was targeted. These universities host departments or institutes dedicated to teaching

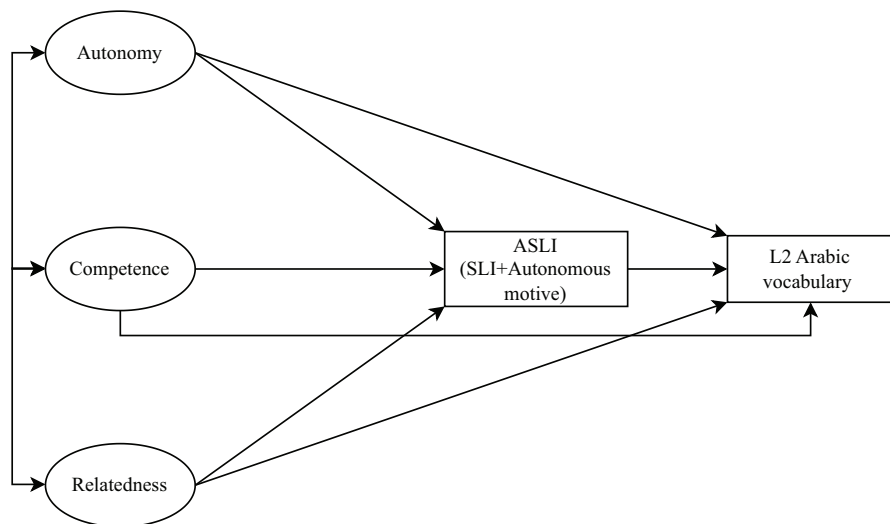


Figure 2 *Hypothesized Model.*

Arabic to non-native speakers. Students from diverse countries enroll in these programs to enhance their knowledge of the Arabic language, culture, and literature, enabling them to communicate more effectively with native speakers and to increase opportunities for interaction within the Saudi context. From this population, the researchers collected responses from 259 participants ($M_{age} = 23.000$, $SD = 2.930$), representing different regions of the world. They came from India, Kenya, South Korea, Nigeria, and UK. The questionnaire was conducted online using Google Forms. Upon opening the link, a consent message appeared, clearly stating that the test is voluntary. To ensure anonymity and encourage honest responses. The university's review committee approved the data collection procedures for this research.

Instrument

Basic Psychological Needs in Second Language (BPN-L2) Scale

To assess students' self-perception about the three BPN, the BPN-L2 scale (Alamer, 2022a) was adapted. Four items for each construct in a 5-point Likert-type response format ranging from 1 (strongly disagree) to 5 (strongly agree). Example items are as follows: for autonomy, 'I am able to freely decide my own pace of learning in English'; for competence, 'I feel I am capable of learning English', and for relatedness, 'People around me care about my progress'. The consistency of reliability for autonomy $\alpha = .78$; $\omega = .80$, competence $\alpha = .85$; $\omega = .86$, and relatedness were $\alpha = .68$; $\omega = .69$.

Autonomous Single Language Interest (ASLI)

As elaborated in Alamer and Almaghlouth (2024), ASLI was operationalized as an index of two related variables: *autonomous motivation* and *single language interest* (SLI).

- 1. **Autonomous Motivation:** The first variable was autonomous motivation, taken from the SDT-L2 scale (Alamer 2022a). Four items (two intrinsic and two identified motivation) were used, and participants indicated their agreement with each item on a 5-point Likert scale. Cronbach's alpha for autonomous motivation was $\alpha = .82$, and the average variance extracted (AVE) was .65.
- 2. **Single Language Interest (SLI):** To evaluate the single language interest variable, three items were used (Alamer 2022b). Participants responded to the items in a dichotomous *true of me/not true of me* format to avoid middle answers which can obscure whether a participant holds a clear, singular interest. An example item is "mastering the L2 is the only long-term interest I have during my [university studies]." Participants with true responses had clear SLI, while those with not true responses had no clear SLI. Cronbach's alpha for the SLI (excluding autonomous motivation) was $\alpha = .69$.

When the data of *autonomous motivation* and *SLI* were combined, ASLI scores were obtained, with a maximum of nine and a minimum of zero. Table 1 summarizes the method to calculate the scores of ASLI. As SLI is the central component of ASLI, it was the first check to determine if a participant can be considered having ASLI.

L2 Arabic Vocabulary Test (Arabic-VLT)

The Arabic Vocabulary Levels Test (Arabic-VLT; Alamer, Al Khateeb et al., 2025) was used to measure vocabulary achievement. This instrument assesses Arabic vocabulary

Table 1 *How ASLI Scores are Derived from Sli and Autonomous Motivation Items*

ID	SLI item 1	SLI item 2	SLI item 3	Candidate status	Intrinsic item 1	Intrinsic item 2	Identified item 1	Identified item 2	ASLI total score
1	True of me	True of me	True of me	Yes (1 point); proceed to autonomous motivation items	Strongly agree (2 points)	Strongly agree (2 points)	Strongly agree (2 points)	Strongly agree (2 points)	9 points
2	Not true of me	Not true of me	True of me	No (0 points); do not proceed	Strongly agree (2 points)	Strongly agree (2 points)	Strongly agree (2 points)	Strongly agree (2 points)	0 points
3	True of me	True of me	Not true of me	Yes (1 point); proceed to autonomous motivation items	Strongly agree (2 points)	Agree (1 point)	Agree (1 point)	Agree (1 point)	6 points

Note. Participants qualify as candidates for ASLI scoring if they respond “True of me” to at least two SLI items. Qualified participants receive 1 point, after which their autonomous motivation items (intrinsic and identified regulation) are scored. Each autonomous motivation item is scored on a 0–2 point scale depending on the strength of their endorsement (e.g., strongly agree = 2, agree = 1, neither = 0). The final ASLI score is the sum of the SLI candidate point and the autonomous motivation item points.

knowledge as an L2 and provides a profile of knowledge at various frequency levels. The present study adopted the whole level test (150 items) because it was deemed most appropriate for the sample. The Arabic-VLT has a structured format, with each level consisting of 30 questions. These questions are grouped into 10 sets, each containing six words. Each set has three correct answers and three incorrect answers. Participants were instructed to select the correct vocabulary word for each definition. Three of the words were correct definitions, while the other three were foils. The whole level test consists of a total of 150 correct answers, with a maximum score of 150 and a minimum score of 0. Participants receive one point for each correct match and zero points for each incorrect match, meaning there is no penalty for incorrect responses.

Statistical Analysis

Bayesian SEM (BSEM) was used in this study. Bayesian analysis updates prior beliefs about the parameters with revised evidence (Alamer, 2025; Depaoli, 2021; Hair et al., 2019). The credible interval (95%) indicates the probability that a parameter's true value falls within a specified range based on the observed sample. This interpretation is comparable to statistical significance (the p -value). The posterior reflects the revised understanding. Thoughtful priors incorporating theoretical knowledge and empirical evidence were used to ensure informed assumptions. Specifically, small-variance priors and informative priors based on previous studies were applied to the structural path: ASLI $\rightarrow$ vocabulary achievement; $N(8, .01)$ to facilitate the estimation of the structural model based on empirical evidence from past research (e.g., Alamer & Almaghlouth, 2024; Alharfi & Alamer, 2025). Bayesian estimation relies on the posterior predictive p -value (PPP), with a PPP value near .50 suggests a good fit (Muthén & Asparouhov, 2012). Before estimating the model, the data were screened for descriptives and normality, although BSEM does not assume normal data (Alamer, 2025). Correlational analyses were conducted using Jamovi 2.7 (The Jamovi Project, 2024) while BSEM was conducted using Mplus 8 (Muthén & Muthén, 2017).

Results

Table 2 displays the descriptive statistics, including the mean (M), standard deviation (SD), and the correlation matrix. The normality checks revealed that none of the variables exceeded a value of $-2/2$ in either skewness or kurtosis (Alamer, 2025). Although correlations with vocabulary achievement seem small mediation can still be examined given the theoretical model and the possibility of suppressor/control relations among predictors.

First, the measurement model through CFA using Bayesian estimation was conducted. The model fitted the data perfectly (i.e., PPP value was .51) with all factor loadings being above .50. Given the satisfactory performance of the measurement model, I proceed with the primary analysis of the study.

To answer our research question and examine the relationship between the variables, the BSEM was used, and the structural model fitted the data well (i.e., PPP value was .55). The exogenous variables (i.e., autonomy, competence, and relatedness) explained 7% of the variance in vocabulary achievement and 19% of the variance in ASLI, which are considered small-to-moderate proportions of explained variance.

Table 2 Correlation Matrix based on Pearson's Rho Derived from Bayesian Estimation between the Variables of the Study

	1	2	3	4	5
1. Vocabulary achievement	110 (45.18)				
2. ASLI	0.18	7.07 (.96)			
3. Autonomy	0.07	0.32***	4.47 (.83)		
4. Competence	-0.04	0.32***	0.27***	4.54 (.71)	
5. Relatedness	0.02	0.26**	0.14	0.30***	4.07 (1.01)

Note. *PBF₁₀ > 10, **BF₁₀ > 30, ***BF₁₀ > 100; values in the diagonal are *Mean* and between brackets are *SD*.

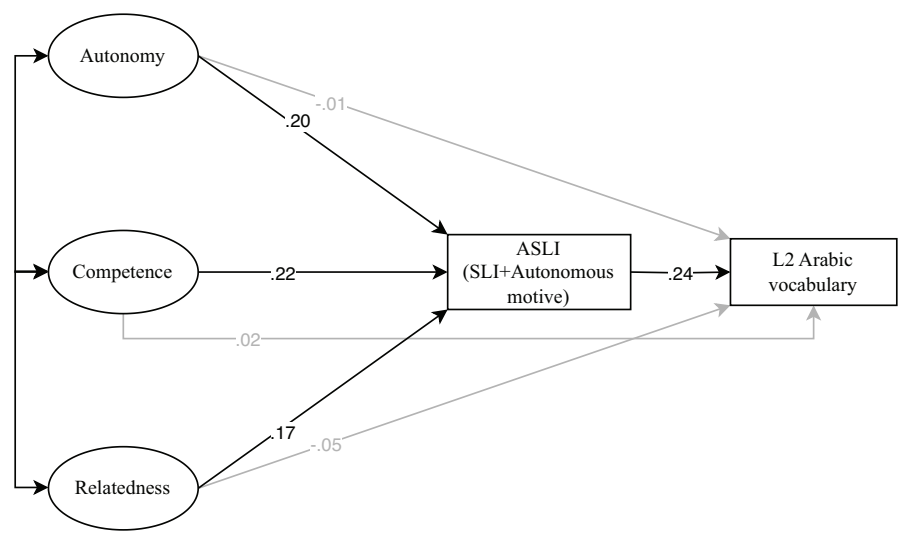


Figure 3 Results of the Structural Model.
Note. Grey lines indicate non-significant effects.

Regarding the path coefficients, several credible direct and indirect associations were observed. For ASLI, autonomy ($\beta = .20$, 95% CI [.06, .32]), competence ($\beta = .22$, 95% CI [.08, .35]), and relatedness ($\beta = .17$, 95% CI [.04, .29]) all showed significant positive associations, suggesting that the three basic psychological needs were related to higher levels of ASLI. For vocabulary achievement, ASLI was the only variable credibly associated with vocabulary achievement ($\beta = .24$, 95% CI [.21, .27]), while the direct associations of autonomy ($\beta = -.01$, 95% CI [-.16, .14]), competence ($\beta = .02$, 95% CI [-.13, .17]), and relatedness ($\beta = -.05$, 95% CI [-.18, .09]) were not credible. Regarding indirect associations, autonomy ($\beta = .05$, 95% CI [.01, .08]), competence ($\beta = .05$, 95% CI [.02, .09]), and relatedness ($\beta = .04$, 95% CI [.01, .07]) all showed small but credible positive indirect associations with vocabulary achievement via ASLI. No other indirect pathways reached credibility.

The findings indicate that the three basic psychological needs were not directly associated with vocabulary achievement, but their relationships were expressed indirectly through ASLI, highlighting the central mediating role of ASLI in supporting vocabulary learning outcomes.

Discussion

The present study examined the role of basic psychological needs in relation to vocabulary achievement through the mediating role of autonomous single language interest (ASLI), a recent theory in educational psychology (Alamer, 2022b; Alamer & Almaghlouth, 2024). The findings indicated that while autonomy, competence, and relatedness were not directly associated with vocabulary achievement, their influence was observed indirectly through ASLI. This highlights the centrality of ASLI in understanding how students' self-perceptions of their psychological needs are related to successful vocabulary learning.

The positive associations of the three needs with ASLI are consistent with self-determination theory, which emphasizes that the satisfaction of autonomy, competence, and relatedness is related to high-quality, autonomous forms of motivation. In line with earlier work that reported the significance of BPN in shaping learners' motivation and sustained efforts (Alamer, 2022a; Alamer, Al Sultan et al., 2025, Alharfi & Alamer, 2025; McEown & Oga-Baldwin, 2019), our findings suggest that learners who perceive their basic needs as fulfilled are more likely to maintain a focused, long-term interest in mastering the language. This long-term interest, operationalized as ASLI, was in turn related to vocabulary achievement, reinforcing recent arguments that ASLI refines the notion of consistency of interest from grit theory (Duckworth et al., 2007; Duckworth, 2016) by emphasizing a singular, autonomously chosen language goal (Alamer & Almaghlouth, 2024).

The mediating role of ASLI aligns with prior studies that highlighted the importance of sustained autonomous motivation in second language success (Alamer, Saeedy et al., 2025; Noels et al., 2019). Our findings are in line with evidence showing that when learners internalize their goals and view the language as a personally valued pursuit, they are more likely to persist in their studies and report higher levels of vocabulary knowledge (Alamer, 2022b). The indirect associations observed for autonomy, competence, and relatedness through ASLI highlight that these needs relate to achievement not directly, but by cultivating the type of long-term, self-determined interest required for vocabulary growth.

The results provide further support for the proposition that ASLI serves as a critical mechanism through which basic psychological needs are associated with vocabulary learning. The study underscores the importance of fostering learning environments that support students' autonomy, competence, and relatedness, as these conditions are related to stronger ASLI and, consequently, higher vocabulary achievement (Deci & Ryan, 1985).

Limitations and Conclusion

This study has some limitations that should be acknowledged. First, only male participants were invited due to accessibility to the authors, which limits the generalizability

of the findings across genders. Future research would benefit from including female participants to provide a more balanced view of the associations among BPN, ASLI, and vocabulary achievement. Second, the study employed cross-sectional data, which does not allow for examining developmental changes or long-term patterns. Longitudinal designs could provide further insight into how these associations unfold over time. Third, the study did not incorporate other potentially important variables such as learners' mindsets, aptitude, attitudes and emotions (Nakamura, 2023), which have been shown in previous research to play a role in language achievement (Griffiths & Soruç, 2020). Including such variables in future models could offer a more comprehensive understanding of the psychological and cognitive factors that relate to vocabulary learning.

In conclusion, this study contributes to the growing body of research on self-determination theory, grit which informed ASLI theory. The study highlighted the mediating role of ASLI in the association between basic psychological needs and L2 Arabic vocabulary achievement. The results suggest that while autonomy, competence, and relatedness were not directly related to vocabulary achievement, their influence was expressed indirectly through ASLI. These findings underscore the significance of ASLI as a central mechanism linking students' self-perceptions of their needs with successful vocabulary outcomes. Taken together, the study emphasizes the importance of supporting learners' basic psychological needs in educational settings, as such support is associated with fostering ASLI and, ultimately, enhancing vocabulary achievement.

Acknowledgements

The author acknowledges the use of generative AI (Gemini 3.0) for language proofreading and stylistic editing to improve the clarity and flow of the manuscript. All final decisions regarding the content and interpretation of the data remain the sole responsibility of the author.

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