English Teaching, Vol. 79, No. 3, Fall 2024, pp. 61-97
DOI: https://doi.org/10.15858/engtea.79.3.202409.61
http://journal.kate.or.kr

Longitudinal Relations Between Interest and Self-efficacy in L2 English Learning

Youngkyo Oh*

Oh, Youngkyo. (2024). Longitudinal relations between interest and self-efficacy in L2 English learning. *English Teaching*, *79*(3), 61-97.

Based on the motivation theories, we postulated that interest in learning languages influences the self-efficacy beliefs of students about their capabilities as second/foreign language (L2) English learners. This study examined the longitudinal causal relation between affective interest and cognitive self-efficacy in the L2 motivational context using the Gyeonggi Education Panel Study (GEPS) data from South Korea. A secondary school student sample from 2015–2020 GEPS over six years comprised 6,314 students (3,189 males and 3,125 females). Using a parallel growth model (PPM) with M*plus* 8.4, the results indicated that the initial level and growth rate of L2 English interest positively predicted L2 English self-efficacy. Subsequently, the initial level of L2 English interest exhibited a negative cross-effect on the growth rate of L2 English self-efficacy. Finally, the sequential causal effect of L2 English interest on self-efficacy was found across the six-year period. The findings are discussed in terms of the pedagogical implications in English learning and teaching practices and further research.

Key words: L2 motivation; L2 English interest; L2 English self-efficacy; Parallel Process Model (PPM)

*Author: Youngkyo Oh, Lecturer, Department of Education, Chonnam National University; Youngbong-ro 77, Buk-gu, Gwangju 61186, Korea; Email: 5young-kyo@hanmail.net

Received 30 June 2024; Reviewed 17 July 2024; Accepted 10 September 2024

1. INTRODUCTION

In the context of language learning, motivation is a fundamental determinant of successful learning outcomes, providing the essential drive that propels learners towards their goals (Dörnyei & Ryan, 2015). Recent advancements in the field of L2 motivation have significantly enhanced our conceptual and methodological frameworks, aligning with developments in applied linguistics and educational psychology (Boo, Dörnyei, & Ryan, 2015; Dörnyei & Al-Hoorie, 2017; Ushioda & Dörnyei, 2017). In light of these advancements, this study aims to leverage state-of-the-art longitudinal techniques to elucidate the specific causal mechanisms within the domain of motivation, thereby offering a more comprehensive and nuanced understanding of its role in language learning.

Although L2 motivation has been extensively studied using the conventional cross-sectional research approach, few empirical studies have thoroughly investigated motivational processes over time. For instance, interest and self-efficacy are recognized as critical motivational factors influencing learning and performance (Eccles & Wigfield, 2002). A research approach that focuses solely on the cognitive aspects of motivation is insufficient for a comprehensive understanding. Therefore, it is crucial to incorporate affective or emotional dimensions to develop a balanced conceptual framework (Pintrich, Marx, & Boyle, 1993).

Interestingly, it was found that interest and self-efficacy are two important subdomains thought to be intricately and reciprocally related (Hidi, Berndorff, & Ainley, 2002, Niemivirta & Tapola, 2007). Some studies concentrated on the unidirectional effects of interest on self-efficacy or vice versa (Fastrich, Kerr, Castel, & Murayama, 2018; Hidi, Ainley, Berndorff, & Del Favero, 2007), and other studies have demonstrated interest to have a positive effect on learners' learning and self-efficacy (Komarraju & Dial, 2014; McIlroy, Poole, Ursavas, & Moriarty, 2015), leading to increased self-regulation and self-efficacy (Tin, 2016).

It is also critical to point out that L2 motivation is recognized as a dynamic trait characterized by temporal variation (Dörnyei, MacIntyre, & Henry, 2015). Accordingly, a more state-of-the-art longitudinal research perspective is essential to better understand precise relations over time among dynamic L2 motivational constructs within a system of language learning (Hernán & Robins, 2020). Given this, we need to investigate how changes in one L2 motivation system component are associated with changes in other L2 motivation components across time.

Contemporary motivation research approaches share the assumption that both motivational concepts are significantly and dynamically interrelated in learning contexts. However, only a few studies have longitudinally explored the interplay between affective and cognitive motivational constructs in L2 learning contexts. This study utilized the

expectancy-value theory (EVT) that highlights the importance of two motivational concepts that learners hold about themselves: expectancies and task values (Wigfield & Eccles, 2000). Regarding expectancies, we focused on students' perceived capability to complete learning tasks, self-efficacy (Usher, 2015). For different types of task values, we focused on interest to encompass intrinsic or attainment values (Wigfield, Tonks, & Klauda, 2009).

L2 motivation research needs to incorporate sophisticated insights from multiple theories to explore the in-dept mechanism of motivation within learners' emotions and minds. This study partially adopted self-determination theory (SDT) as the conceptual framework to explore the affective aspect of the self and draw on the social cognitive theory (SCT) to focus on the cognitive sense of self-mechanism. We find it critical to better understand the connection between these two constructs of L2 motivation using a comprehensive longitudinal review of related theories. Based on the theoretical backgrounds, we propose the following hypothesis: L2 English interest predicts L2 English self-efficacy over an extended period of L2 motivation development. Specifically, we longitudinally investigate how L2 learners' interest in terms of an affective trait is related in a directional manner to their cognitive expectancy, that is, their competence beliefs of self-efficacy.

In this study, we examined two major motivational constructs within the framework of the EVT: individual interest, representing attainment value, and self-efficacy, representing the expectancy components. Based on the longitudinal causal study by Lee and Seo (2021), which utilized the modern EVT, we investigated the longitudinal relationship from interest to self-efficacy. In the context of English language learning, it is hypothesized that there will be predictive links between these constructs as they develop throughout secondary education.

The study addressed the following research questions: Do the two L2 motivational constructs change over time, and if so, does L2 English interest predict L2 English self-efficacy over time? Hence, this study explored how L2 English interest, as an affective motivational construct, is related to an individual's cognitive functioning, specifically L2 English self-efficacy. Additionally, it examined whether L2 English self-efficacy predicts students' English achievement.

2. LITERATURE REVIEW

2.1. Interest and Self-efficacy in Motivational Framework

Among major subdomains of L2 motivational research field, interest and self-efficacy in English learning are distinct but associated, time-varying constructs. To explore the directional relationship between the enjoyment of language learning and other motivational attributes in-depth, this study drew on SDT and the concept of interest, which refers to pure

enjoyment or joy of engaging in specific tasks or activities (Deci & Ryan, 2008; McEown, Noels, & Saumure, 2014; Oga-Baldwin, Nakata, Parker, & Ryan, 2017). SDT emphasizes value, which is operationalized as the degree to which interest, in the absence of external influences or outside diversions, drives human behavior.

A second framework, SCT is a well-established framework for understanding how learning occurs through reciprocal interactions in a social and dynamic context. SCT acknowledges the importance of one's perceived competence rather than actual competence in individuals' performance. Perceived competence is a core concept of self-efficacy (Bong & Skaalvik, 2003), which indicates the conviction that one can successfully execute the behaviors needed to acquire the desired outcome (Bandura, 1997; Schunk, 1991). More precisely, students' motivation to continue language learning may be influenced by their perception regarding language learning demands.

Wigfield and Cambria (2010) highlighted the work of Pintrich et al. (1993), who distinguished individuals' motivation-related beliefs about their abilities to do tasks and competence belief of self-efficacy. When faced with a learning activity, reasons for doing the task, as well as salient competence beliefs, serve as drivers for the cognitive processing required to complete the learning activity. Further, affective states are important sources of self-efficacy according to SCT (Bandura, 1997), implying that an interested student is likely to interpret task enjoyment as an indicator of task competence (Grigg, Perera, McIlveen, & Svetleff, 2018; Usher & Pajares, 2009). In another study, prior mathematical interest was a positive predictor of subsequent mathematical self-efficacy, whereas the opposite was not true (Grigg et al., 2018).

A third motivational framework, EVT (Eccles, 1983; Wigfield & Eccles, 2000) offers two fundamental motivational constructs—expectation for success and values—that influence students' educational outcomes. While some motivational development theories posit that self-efficacy predicts later interest (Eccles & Wigfield, 1995; Eccles, Wigfield, & Schiefele, 1998), EVT offers a different perspective. It suggests that the values students hold can precede and shape their expectations for success. Empirical evidence supports this assertion, demonstrating that students who have a strong interest in a specific school subject are more likely to engage actively in related tasks (Linnenbrink-Garcia, Patall, & Messersmith, 2013; Pinxten, Marsh, De Fraine, Van Den Noortgate, & Van Damme, 2014). Such engagement not only encourages re-engagement with meaningful tasks but also leads to mastery experiences that reinforce students' positive perceptions of their capabilities (Köller, Baumert, & Schnabel, 2001; Lent, Brown, & Hackett, 2002), particularly when students can select tasks based on their interests (Lent et al., 2008; Schunk, Meece, & Pintrich, 2014).

According to Lee and Seo's (2021) findings, students usually consider their career goals and interests when deciding between academic tracks, which is consistent with EVT - values predict academic choices more strongly than expectancies do, whereas expectancies predict

academic achievement more strongly than values do (Guo, Parker, Marsh, & Morin, 2015; Trautwein et al., 2012; Wigfield & Eccles, 2000). Students make different commitments to different subjects based on their academic track, resulting in varying levels of expectancy for different subjects. In particular, the values of Korean students may be expected to influence later expectations. The characteristic of highly competitive Korean education might be expected to strengthen the directionality from prior interest to later self-efficacy, despite the reverse directionality found in other previous empirical studies (e.g., Arens, Schmidt, & Preckel, 2019; Lauermann, Eccles, & Pekrun, 2017; Lent et al., 2008; Viljaranta, Tolvanen, Aunola, & Nurmi 2014).

Moreover, the Four-Phase Model of Interest Development (Hidi & Renninger, 2006) describes how interest develops through triggered and sustained situational interest, emerging and well-developed individual interest. Individual interest in a domain appears to predict persistence, effort, and learning progress, as reflected in students' perceived competence and actual achievement in the domain (Renninger & Hidi, 2002; Schiefele, 2009).

2.1.1. Interest

Hidi and Renninger (2006) proposed that interest is the most fundamental and widespread human emotion that directs awareness and helpfulness. They emphasized that interest is commonly referred to as an intensified thoughtfulness and an emotive commitment that arises when an individual has a positive interaction with content or activity in an L2 learning context. Later, Renninger and Hidi (2016) illustrated the dynamic relationship between knowledge and coordinated valuing, as well as the positive emotions that characterize interest development.

Given the critical role of interest in learning, it was paramount for researchers to understand how interest could be developed amidst the learning process (Barron, 2006; Hofer, 2010; Renninger & Su, 2019). Based on the EVT, interest was investigated as a task value construct (Lauermann et al., 2017). The more students enjoy doing the task, the more they will engage in learning. Interests also influence students' direction of attention toward the content of learning and not toward others (Renninger, 2000). Other empirical studies reported a decline in students' interest in school subjects as students' levels of schooling increase (Denissen, Zarrett, & Eccles, 2007; Hidi, 2000), although the interest of students can develop via the customized tasks and facilitative learning environment (Frenzel, Goetz, Pekrun, & Watt, 2010; Guthrie, et al., 2006; Nolen, 2007). Notably, Wigfield and Cambria (2010) also showed a decline in interest among elementary and high school students related to the learning environment's quality.

Previous studies suggested that interest is partly dispositional and partly situational.

Interest can be defined as a psychological state arising from environmental stimuli and a predisposition to engage with a particular disciplinary content over time (Hidi, 2000; Krapp, 2007; Renninger & Hidi, 2011). Furthermore, interest can be extended as a motivation resource that enables students to focus on learning activities, hold positive attitudes, and persist in learning (Hidi, Berndoff, & Ainley, 2002; Katz, Assor, Kanat-Maymon, & Bereby-Meyer, 2006). As an individual's interest develops, it is likely to incorporate into an individual's identity, i.e., self-system (Dörnyei, 2009; Renninger, 2009).

Research about interest is yielding a complex picture of how interest in a domain grows through the provision of supportive contexts based on understanding how interest interacts with a variety of related motivational constructs (Ainley, Hidi, & Berndorff, 2002; Krapp, 2002; Renninger & Hidi, 2011; Schiefele, 2009). In the context of English language learning, recent research findings indicate that learners' interest plays a significant facilitative role (Bai, Nie, & Lee, 2020). Specifically, students' interest and self-efficacy—referred to as the "want" and "can" of motivation—affect both the learning process and task performance through enhanced engagement (Ainley, 2010; Bandura, 1982).

2.1.2. Self-efficacy

Self-efficacy for motivating engagement in learning has been well-researched in an educational context (Schunk, Pintrich, & Meece, 2008). In the context of L2 English learning, self-efficacy refers to students' beliefs that they will be consistently successful in the learning tasks presented by their course, or more precisely, in the specific tasks they encounter in their English language classes. Self-efficacy is defined as an individual's evaluative belief in their ability to succeed in a particular task or subject (Bandura, 2006).

This perceived competence and conviction in one's capability to effectively complete a learning task is strongly related to their desire to participate in more demanding activities and a strong indicator of commitment (Malureanu, Panisoara, & Lazar, 2021). Much research work has documented the importance of self-efficacy, which is largely cognitive in nature and facilitates academic achievement (Pintrich, 1999; Zimmerman & Bandura, 1994). Overall, self-efficacy is deemed an essential construct in motivational research because of the strong empirical relationship between self-efficacy beliefs, motivation, and behavior (Dörnyei & Ryan, 2015).

Self-efficacy has often been termed linguistic self-confidence (Mills, 2014), and this high sense of belief in oneself was demonstrated to be positively related to L2 achievement (Hsieh & Kang, 2010) with specific language skills, such as listening, reading, and writing (Graham, 2011; Mills, Pajares, & Herron, 2006, 2007; Oh & Cha, 2017), and with L2-related task performance (Hsieh, 2008).

It was revealed that self-efficacy was likely to decline as students advanced through school

(Schunk, 2010). This trend is reflected by the differences in the quality of self-efficacy that become more apparent with increasingly challenging academic tasks – that is, students are differently prepared to deal with the more demanding level of subjects. Other researchers also documented that student motivation shows a declining trend over time (Archambault, Eccles, & Vida, 2010; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). However, the results of some previous works have been mixed; it was shown that English self-efficacy either increases (e.g., Oh, 2022a) or decreases (e.g., Otis, Grouzet, & Pelletier, 2005) during secondary school.

2.2. Causality Between Interest and Self-efficacy in L2 Motivation Domain

Researchers are interested in exploring the longitudinal relationship between distinct but related sub-dimensions of L2 motivation in a single model. Change in one subdomain of L2 motivation is often related to change in another subdomain over time, leading to parallel growth curves of subdomains. Interest and self-efficacy are fundamental constructs in the L2 motivational field because both factors are highly influential in academic learning contexts (Bandura, 1997; Eccles & Wigfield, 2002; Hidi & Renninger, 2006; Krapp, 2007; Oh, 2022a, b; Oh & Cha, 2017; Smith, Kass, Rotunda, & Schneider, 2006).

Throughout the developmental period of adolescence, students gradually lose confidence in their ability to complete academic tasks and view them as less interesting and less significant (Chouinard & Roy, 2008). This simultaneous decline in expectations and values has prompted researchers to theorize that expectations and values may be reciprocally related (Jacobs et al., 2002; Lee & Seo, 2021; Wigfield et al., 2009).

When looking into the causal relations between interest and self-efficacy, some confusion may arise from studies conducted at different specificity levels. Most evidence on task-specific relations and predictions still comes mostly from cross-sectional studies (Hidi et al., 2007) or studies on reciprocal effects that showed interest and self-efficacy to predict both each other and performance during an inductive reasoning task, although the effects were not consistent across task sections (Nuutila et al., 2020).

In some studies, it has been postulated that a certain level of self-efficacy could be a prerequisite for interest to arise in the first place (Silvia, 2003) and that it may reinforce interest through positive affect (Tanaka & Murayama, 2014) and feelings of satisfaction obtained through performance and sense of mastery (Bandura & Schunk, 1981). However, interest may increase confidence through elevated focus (Hidi, Renninger, & Krapp, 2004), persistence (Ainley, Corrigan, & Richardson, 2005; Hidi et al., 2002; Tulis & Ainley, 2011), effort (Patall, Vasquez, Steingut, Trimble, & Pituch, 2016), and positive emotions (Flowerday & Shell, 2015). Subsequently, this may improve performance and, in turn, perceived competence (Bandura, 1978).

In greater detail, concerning the causal relationship between interest and competence beliefs of self-efficacy, extensive research indicates that interest is linked to increased persistence (Ainley et al., 2005), higher attention, and more efficient cognitive processing (Hidi et al., 2004), leading to enhanced performance and learning outcomes (Rotgans & Schmidt, 2018). Similarly, self-efficacy enhances performance through greater persistence and effort (Honicke & Broadbent, 2016) as well as more efficient cognitive processing (Phan, 2012), further contributing to academic success (Talsma, Schuz, Schwarzer, & Norris, 2018).

Namely, the motivational research approach of interest has revealed that interest predicts the persistence, effort, and progress of learning reflected in students' perceived competence within the domain (Renninger & Hidi, 2002; Schiefele, 2009). By investigating the systemic ordering structures, the interest was found to develop one's sense of competency (Renninger, 1989; 1990) and self-efficacy (Bandura, 1997). More precisely, positive feelings of interest generally precede the cognitive recognition that one pursues the activity for its own sake (Hidi & Harackiewicz, 2000), according to the SDT perspective.

Although these motivational processes are believed to be interconnected, the task can influence how well interest and self-efficacy are coupled (Ainley, Buckley, & Chan, 2009). If the task was thought to be too simple, even students with high confidence might lose interest (Rotgans & Schmidt, 2014; Silvia, 2003). Instead, if their capacity proves inadequate and their expectations do not match reality during the task, a decline in interest and self-efficacy may follow (Ainley et al., 2009).

Silvia (2005) attested that the experience of interest is aroused by certain factors, such as novelty, complexity, and uncertainty, which link interest to self-efficacy. For instance, the level of subjective uncertainty that arouses interest is moderated by self-efficacy; if the outcome of a task is certain, that is, when self-efficacy is either extremely high or extremely low, the task is unlikely to arouse any interest. This is in line with Bandura's (1986) argument that superior self-efficacy, just as severe self-doubt, may render activities unchallenging and uninteresting.

More precisely, some individuals do not show interest, despite their high levels of self-efficacy (Renninger, Cai, Lewis, Adams, & Ernst, 2011). Contrarily, others show interest in specific tasks or domains, even when their competence levels are low (Renninger, Ewen, & Lasher, 2002). Therefore, affective states appear to influence students' learning processes independently, regardless of the strengths of cognitive motivational constructs. Even when students possessed strong self-efficacy beliefs, their self-regulatory processes were interrupted by negative affect, such as boredom and anxiety (Ahmed, Van der Werf, Kuyper, & Minnaert, 2013). These results implied that individual interest could influence the self-regulatory functions of the motivational effects of self-efficacy.

According to prior studies, interest is reported to lead to higher self-efficacy and self-regulation (Tin, 2016). In particular, Hidi et al. (2002) documented that self-efficacy beliefs

developed from positive emotions and stated, “When students engage in an activity with interest, they tend to be focused, persistent and effortful, and experience positive emotions…. With such engagements, one would expect improved performance and a corresponding increase in their self-efficacy” (p. 433).

Research has been conducted concerning the theoretical and empirical relationship between interest and self-efficacy beliefs for writing tasks (Ainley et al., 2009). The results revealed that interest had a one-way effect on efficacy. These unidirectional predictions in domain-specific contexts point to possible links between changes in interest and self-efficacy over time. Empirical evidence also suggests that interest predicts self-concept more than self-concept predicts interest (Ganley & Lubienski, 2016; Pinxten et al., 2014). A recent cross-lagged reciprocal effects model within the structural equation modeling(SEM) framework revealed that situational interest has a stronger effect on self-efficacy than vice versa (Nuutila et al., 2020). In the Korea Education Longitudinal Study (Kim et al., 2005), interest was found to have a stronger causal influence on self-efficacy (Bong, Lee, & Woo, 2015). Another study showed the subject interest had a positive influence on self-efficacy (Kim & Lee, 2019). A recent study on L2 motivation by Oh (2022b) showed that intrinsic motivation in middle school students positively impacted their English achievement through learning engagement. However, self-efficacy diminished the positive mediating effect of intrinsic motivation on learning engagement. Instead, self-efficacy exhibited a buffering effect between interest and engagement in English learning, suggesting a negative interaction between L2 interest and L2 self-efficacy.

2.3. Effect of L2 English Self-efficacy on English Achievement

A considerable body of research has investigated the impact of self-efficacy beliefs. For instance, Khodadad and Kaur (2016) explored the link between self-efficacy and academic performance, demonstrating that self-efficacy significantly influences English achievement. Similarly, Demir and Okyar (2021) discovered that self-efficacy predicts students' success in learning English. In another study, the Oh (2022a) identified a strong longitudinal association between self-efficacy and achievement, indicating that self-efficacy is a robust predictor of academic success. Additional studies have also reported a consistent association between self-efficacy and academic performance (Hong & Phan, 2020; Jaekel, 2020; Thompson, Aizawa, Curle, & Rose, 2022; Truong & Wang, 2019). A recent longitudinal study by Zhang, Jiang, and Chen (2023) focused on adolescent students and found that self-efficacy is a predictor of academic achievement in English. These findings, observed across diverse EFL contexts such as Turkey, Saudi Arabia, Iran, China, Korea, and Vietnam, support Bandura’s (1997) assertion that “increased perceived efficacy is accompanied by higher academic attainments” (p.218).

3. METHODOLOGY

3.1. Sample

The data analyzed in this study were retrieved from the largescale longitudinal project "Gyeonggi Educational Panel Study (GEPS)," funded by the Gyeonggi Institute of Education in South Korea. The GEPS benchmarked the National Education Longitudinal Study (NELS) by the National Center for Education Statistics in the U.S. The GEPS was designed to investigate students' cognitive, affective, and social development and to establish effective school education policies.

The GEPS was based on a sample using two-stage stratified sampling to reflect the province's population. Specifically, the GEPS sampling method was as follows. First, Gyeonggi province was divided into 31 areas, used as sampling strata, and then schools within each sampling stratum were randomly sampled. Next, the number of schools sampled was determined in proportion to the number of populations (proportional allocation).

GEPS covered students' fourth grade of elementary school (Grade 4) until the third grade of high school (Grade 12). The present study relied on the secondary school dataset, which tracked students across Grades 7 to 12 (2015-2020). We focused on six measurement waves, with the three waves taking place during middle school (Grades 7 to 9) and high school (Grades 10 to 12) in secondary school years.

Specifically, the six measurement waves start from Waves 4 to 9 of GEPS when the students attended Grades 7 (Wave 4), 8 (Wave 5), 9 (Wave 6), 10 (Wave 7), 11 (Wave 8), and 12 (Wave 9). Each of the six waves took place at the end of the respective school years, starting in 2015. The total sample of the present study consisted of 6,314 students (male = 3,189 (51%) male; female = 3,125 (49%)). During each wave of data collection, sample attrition showed 5,693 at wave 4 to 4,626 at wave 9 for L2 English self-efficacy and 5,695 at wave 4 to 4,633 at wave 9 for L2 English interest.

3.2. Measure

Using a stratified random sampling technique, the GEPS collects data annually (in November) and performs data screening to prepare data for analysis. We utilized students' responses to the survey items indicated as L2 English interest and L2 English self-efficacy beliefs in the GEPS Codebook that have been pre-validated based on evidence reliability and validity. The specific survey items are listed in Table 1 below.

TABLE 1

Description of L2 English Motivational Survey Items

Variables	Item Descriptions
L2 English interest	1. When I study, I read not only textbooks but also other related books. 2. I can concentrate well when I study English. 3. I want to study more because I have a keen interest in English. 4. I enjoyed the challenge of solving slightly more complex English questions above my ability.
L2 English self-efficacy	1. I'm confident I can understand the most difficult content in English class. 2. I'm confident I can understand the complex material presented by the English teacher. 3. I'm confident I can do an excellent job on my English assignments. 4. I'm confident I can receive an excellent grade in English class. 5. I have confidence that I can master and proficiently use what I have learned in English class.

3.2.1. L2 English interest

For L2 English interest, survey items asked students to report their relatively stable affective orientations to English learning rather than their momentary emotional reactions (Hidi, 1990). This survey was developed based on the study of interest by Schiefele (1991), in which interest is defined as a content-specific motivational characteristic composed of intrinsic feeling-related and value-related valences (Yoon & Kim, 2003). Each item represents a specific level of L2 English interest.

3.2.2. L2 self-efficacy

The Motivated Strategies Learning Questionnaire for Adolescents scale (Pintrich & DeGroot, 1990) was used to measure L2 self-efficacy in the GEPS panel data. Five items were rated on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree), measuring efficacious appraisals of ability and performance expectations in L2 learning contexts (Kim, Kim, Kang, Kim, & Shin, 2007). Each item, similar to the scales that have been based on can-do assessment (Usher, 2015), represents a specific level of L2 English self-efficacy.

3.2.3. English achievement

English achievement was evaluated using two metrics: the grade achieved in the school's final examinations and the scores obtained from the June practice tests administered by the Korea Institute for Curriculum and Evaluation in the subject of English. The grades are organized into a nine-tier system, where Grade 1 represents the highest level of achievement

and Grade 9 is the lowest.

3.2.4. Covariates

Gender (male = 0, female = 1) and prior achievement were included as covariates (Lee & Seo, 2021). The prior achievement was operationalized as the vertically scaled standardized scores that students obtained on English achievement tests at Grades 7.

3.3. Data Analysis

We analyzed the panel data tracking from 7th grade to 12th grade. A parallel process model (PPM) between interest and self-efficacy in L2 learning for six years of secondary school was tested while controlling for gender and achievement. The PPM in this study allowed researchers to examine the associations among growth parameters for L2 English interest and self-efficacy trajectories. The first step for developing a PPM model was to confirm that each primary growth curve model was successfully modeled independently (i.e., checking global model fit). Subsequently, it was necessary to determine from each growth model whether there was sufficient inter-individual variation in the initial levels and slopes. Significant variations in the intercepts and slopes show evidence that applying a PPM is required. Therefore, the univariate growth models were estimated using two subdomains of L2 English interest and self-efficacy. Subsequently, the growth parameters (i.e., intercept and slope variance) of each model were correlated in multiple ways.

The global goodness-of-fit of each growth model was examined with the χ^2 test. However, because the χ^2 test is too sensitive to large sample size, and given the non-normality of the data, we also considered the CFI, TLI, RMSEA, and SRMR. Values higher than 0.95 for both the TLI and the CFI and lower than 0.06 for RMSEA, and 0.08 for the SRMR were considered a well-fitting model for the data (Hu & Bentler, 1998).

When estimating a PPM, we used modification indices to identify potential covariances among manifest indicators in this model. The inclusion of these covariances may improve model fit indices. Comorbidity within the subdomains at different measurement occasions is common. Because these modifications are theoretically and empirically justifiable, a PPM was re-specified to include these two additional correlations.

The data analysis was performed using the M*plus* software, version 8.4 (Muthén & Muthén, 2019), with the robust maximum likelihood estimator. A PPM allows researchers to examine whether growth factors of L2 English interest and self-efficacy have significant means and variances describing inter-individual differences in intra-individual trends within each subdomain (i.e., L2 English interest and self-efficacy). Crucially, researchers can identify covariance among growth factors to understand the co-development of L2 English

interest and self-efficacy, capturing the commonality among growth factors.

A growth model for a specific subdomain k is defined as:

$$Y_{ikt} = \pi_{0ik} + \lambda_t \times \pi_{1ik} + \epsilon_{ikt}, \quad \epsilon_{ikt} \sim NID(0, \sigma^2_{ikt}) \tag{1.1}$$

where k = 1, 2, … is the subdomain; i is 1, 2, …, n, respondents, and is the error term for the i^{th}individual at time t. For a linear change with six equally spaced measurements, t can be 0, 1, 2, … and 6. Residuals at each time point are assumed to be normally and independently distributed (NID) with means of zero. As in a growth curve model, for each individual, equations link y measures of subdomain k at the repeated time points using an intercept (π_{0ik}) and a slope (π_{1ik}). In this study, the equations for PPM using L2 English interest and L2 English self-efficacy trajectories as the subdomains can be described as follows: For the growth curve of L2 English interest (k = 1),

$$Y_{i1t} = \pi_{0i1} + \lambda_t \times \pi_{1i1} + \epsilon_{i1t}, \quad \epsilon_{i1t} \sim NID(0, \sigma^2_{1t}) \tag{1.2}$$
$$\pi_{0i1} = \mu_{001} + \zeta_{0i1}, \quad \zeta_{0i1} \sim NID(0, \psi_{0111}) \tag{1.3}$$
$$\pi_{1i1} = \mu_{101} + \zeta_{0i1}, \quad \zeta_{0i1} \sim NID(0, \psi_{1111}) \tag{1.4}$$

For the growth curve of L2 English self-efficacy (k = 2),

$$Y_{i2t} = \pi_{0i1} + \lambda_t \times \pi_{1i2} + \epsilon_{i2t}, \quad \epsilon_{i2t} \sim NID(0, \sigma^2_{2t}) \tag{1.5}$$
$$\pi_{0i2} = \mu_{002} + \zeta_{0i2}, \quad \zeta_{0i2} \sim NID(0, \psi_{0022}) \tag{1.6}$$
$$\pi_{1i2} = \mu_{102} + \zeta_{0i2}, \quad \zeta_{0i2} \sim NID(0, \psi_{1122}) \tag{1.7}$$

where i is 1, 2, …, n, respondents, and is the error term for the ith individual at time t. Residuals at each point in time and both levels are assumed to be NID with means of zero.

In short, the current study employed a longitudinal research design to model interest as an antecedent of developing self-efficacy in the L2 English learning context. We examined the longitudinal influence of L2 English interest on the development of L2 English self-efficacy using measures from six-time points across six academic years among Korean secondary students learning English as a foreign language.

3.4. Missing Values

As in most longitudinal data, some respondents' data are missing during one or more data collection periods. The modern method for modeling with missing data uses all available

data points (Lang & Little, 2018) and adjusts the standard errors and scales chi-square statistics to account for non-normally distributed data. Thus, to address missing values, full information maximum likelihood with robust standard errors (Enders, 2010), available in Mplus 8.4 (Muthén & Muthén, 2019), was applied to estimate the model parameters because it permits the inclusion of all available data in the analysis and is the preferred method to allow generalizations of results to the population (Benner & Graham, 2009).

4. RESULTS

4.1. Descriptives

We used the panel data of L2 English interest and self-efficacy collected in grades 7, 8, 9, 10, 11, and 12. Responses to L2 English interest and self-efficacy were recorded on a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree). In Table 2, a general description of variables, including controlling variables, is reported.

TABLE 2

Description of Two L2 English Motivational Variables and Other Variables

Variables	Descriptions
Gender	0=male, 1=female
Prior achievement	Vertically-scaled achievement scores
English school record	Scores (levels) are graded on a 9-point scale from 1 to 9
English practice test grade	Scores (levels) are graded on a 9-point scale from 1 to 9
L2 English interest	Composite score of four English interest indicator items
L2 English self-efficacy	Composite score of five English self-efficacy indicator items

Note. Grade levels are assessed on a nine-point scale, where lower grades represent higher achievement.

Longitudinal descriptive statistics for L2 English interest and self-efficacy from Wave 4 to Wave 9 are reported in Table 3. According to the mean values, annual scores (growth trajectories) of both L2 English interest and self-efficacy declined. The internal consistency reliability (Cronbach's α) estimates for L2 English interest were .894, .885, 890, 867, .874, and .863, respectively. Other internal consistency reliability (Macdonald's ω) estimates for L2 English interest were .895, .886, 891, 868, .875, and .864, respectively. The internal consistency reliability (both Cronbach's α and Macdonald's ω) estimates for L2 English self-efficacy were .949, .948, .948, .935, .938, and .942 in annual order.

In this study, Little's MCAR (1988) test was performed to check for the quality of the missingness, and Mardia's tests (1980) of multivariate normality were carried out to check for the normality assumption. The results of Little's MCAR test were χ^2=711.943, df=574,

and p = .000, indicating the violation of the MCAR assumption (not tabled).

Furthermore, there was no violation of univariate normality. However, according to the multivariate normality test results, the two-sided multivariate skew test fit had a 3.74 sample value, .509 mean value, and p=.000, whereas the two-sided kurtosis test of fit showed 217.013 sample value, 167.936 mean value, and p=.000, indicating the violation of multivariate normality assumption (not tabled). Furthermore, the full information maximum likelihood method, which uses all the information in the data, was applied to estimate the model's parameters in the case of nonnormality because it is the preferred method to allow generalizations of results to the population (Benner & Graham, 2009).

TABLE 3

Descriptive Statistics of L2 English Motivational Variables at Each Measurement Time Point

Variables	*N*	*M*	*SD*	*Min*	*Max*	Skew	Kurtosis	α	ω
Gender	6,314	.49	.50	0	1	.02	-2.00	-	-
Prior achievement	5,724	476.28	98.49	278.9	653.1	.31	-1.19	-	-
English school record	4,367	4.38	.03	1	9	.23	-.44	-	-
English practice test grade	3,526	4.24	.03	1	9	.32	-.59	-	-
Wave 4 interest	5,695	3.28	1.01	1	5	-0.08	-0.30	.894	.895
Wave 5 interest	5,571	3.23	1.02	1	5	-0.08	-0.29	.885	.886
Wave 6 interest	5,405	3.21	1.00	1	5	-0.05	-0.20	.890	.891
Wave 7 interest	4,890	3.20	1.00	1	5	-0.09	-0.21	.867	.868
Wave 8 interest	4,788	3.11	1.00	1	5	-0.07	-0.19	.874	.875
Wave 9 interest	4,633	3.06	0.97	1	5	-0.04	-0.09	.863	.864
Wave 4 self-efficacy	5,693	3.61	1.01	1	5	-0.35	-0.35	.949	.949
Wave 5 self-efficacy	5,570	3.53	1.03	1	5	-0.29	-0.39	.948	.948
Wave 6 self-efficacy	5,403	3.46	1.03	1	5	-0.24	-0.36	.948	.948
Wave 7 self-efficacy	4,895	3.45	1.01	1	5	-0.28	-0.32	.935	.935
Wave 8 self-efficacy	4,787	3.38	1.01	1	5	-0.26	-0.23	.938	.938
Wave 9 self-efficacy	4,626	3.34	0.99	1	5	-0.16	-0.18	.942	.942

Note. Cronbach's α, Macdonald's ω

4.2. LGCM and PPM Model Building

Table 4 shows the goodness of fit test results and the growth factor parameters of L2

English interest and self-efficacy, respectively. Both latent growth curve models showed excellent global model fit statistics to the data. The initial levels and growth rates of the mean and variance for both the L2 English interest and self-efficacy showed statistically significant values. Specifically, the negative slope indicated the declining growth trajectories for L2 English interest and self-efficacy. The statistically significant variance of intercept and slope indicated the individual difference in the initial value and growth rates of L2 English interest or self-efficacy. Besides, negative covariance also implied the narrowing gap between the initial value and growth rate for both the L2 English interest and self-efficacy over time.

TABLE 4

Growth Factors of L2 English Interest and Self-efficacy LGCM

L2 English Motivation		Interest			Self-Efficacy		
		Coeff.	*SE*	*t-value*	*Coeff.*	*SE*	*t-value*
Means	Intercept	3.289***	0.012	275.353	3.595***	0.012	290.451
	Slope	-0.044***	0.003	-14.392	-0.056***	0.003	-18.428
Variances	Intercept	0.531***	0.016	33.451	0.629***	0.017	37.316
	Slope	0.021***	0.001	19.174	0.023***	0.001	22.529
Covariance		-0.045***			-0.051***		
Model fit	$\chi^2(df)$	181.544***(16)			295.119***(16)		
	AIC/BIC	79,295.589/79,368.838			77,343.302/77,416.552		
	CFI/TLI	0.981/0.982			0.976/0.978		
	RMSEA (90% C.I.)	0.042(0.037, 0.048)			0.055(0.050, 0.061)		
	SRMR	0.030			0.042		

Note. Unstandardized coefficients are shown. Coeff. = Coefficient. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

The results of the basic PPM are shown in Table 5. Results yielded a statistically and substantially better fitting model (χ^2(df) = 639.065(60), $p < .001$; CFI/TLI = .985/.984; RMSEA = .041; SRMR = .063) compared with each individual growth model. The correlation matrix among growth factors of two L2 motivation factors in the basic PPM model provided evidence for the existence of both between- and within-subdomain autocorrelated error structures.

TABLE 5

Results of the PPM Using L2 English Interest and Self-efficacy

L2 English Motivation	Intercept (Unstandardized)		Slope (Unstandardized)		Correlations among growth factors (Standardized)			
	Mean	Var	Mean	Var		I(SELF)	I(INT)	S(SELF)
INT	3.290***	.422***	-0.045***	.013***	I(SELF)	.		
					I(INT)	***.833*****	.	
SELF	3.595***	.518***	-0.056***	.017***	S(SELF)	-.159***	.	.
					S(INT)	.	-.109***	***.691*****
Global Model Fit Indices			$\chi^2(df)$		639.065***(60)			
			AIC/BIC		138,500.571/138,700.343			
			CFI/TLI		0.985/0.984			
			RMSEA (90% C.I.)		0.041(0.038～0.044)			
			SRMR		0.063			

Notes. Autocorrelations among subdomains are simultaneously not shown.
Var = variance, I(INT) = Intercept of L2 English interest, I(SELF) = Intercept of L2 English self-efficacy, S(INT) = Slope of L2 English interest, S(SELF) = Slope of the L2 English self-efficacy.
$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$.

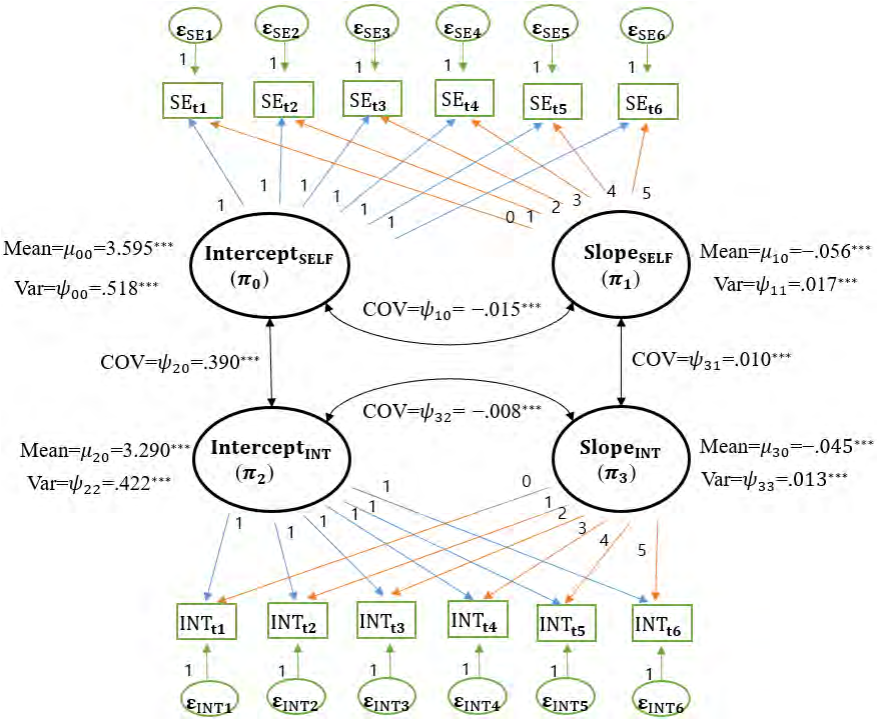
All growth factors (i.e., means and variances for both the intercept and slope) across the two growth curves of L2 English interest and self-efficacy were statistically significant. The covariances among the primary growth factors were also statistically significant, confirming the parallel growth process of the two L2 motivational constructs. Significantly, correlations (i.e., standardized covariances) among the intercepts of the two L2 motivational constructs were higher than the correlations between the intercepts and slopes (see the bold and italic numbers in Table 5). Similarly, correlations among the slopes of the two L2 motivational constructs were higher than the correlations between the intercepts and slopes.

As shown in Figure 1, growth factors of interest and self-efficacy in English learning can be correlated within each L2 motivational construct; that is, the results indicate a negative correlation between the initial level (intercept) and growth rate (slope) of L2 English interest or a negative correlation between the initial level and growth rate of L2 English self-efficacy. In addition, correlations can be estimated among growth factors between different L2 motivational constructs (i.e., the results indicate a positive correlation between the intercept of L2 English interest and the intercept of L2 English self-efficacy or a positive correlation between the slope of L2 English interest and the slope of L2 English self-efficacy). These non-directional reciprocal associations indicate the co-occurrence of two L2 motivational constructs and their co-development over time. However, the seemingly correlated

relationship between two L2 motivational constructs was investigated further with a sophisticated longitudinal causality model of PPM. Figure 1 illustrates two growth curves of L2 English interest and self-efficacy in a single PPM model. All parameters or estimators are shown in the figure along with the structural equations and variance-covariance matrix of errors among the latent growth factors.

FIGURE 1

Parallel Process Model



Note. Intercept = Initial level. Slope = Growth rate.
SELF= L2 English self-efficacy. INT = L2 English interest.
i = individual (n = 1, 2,…, n). NID = Normally and independently distributed.

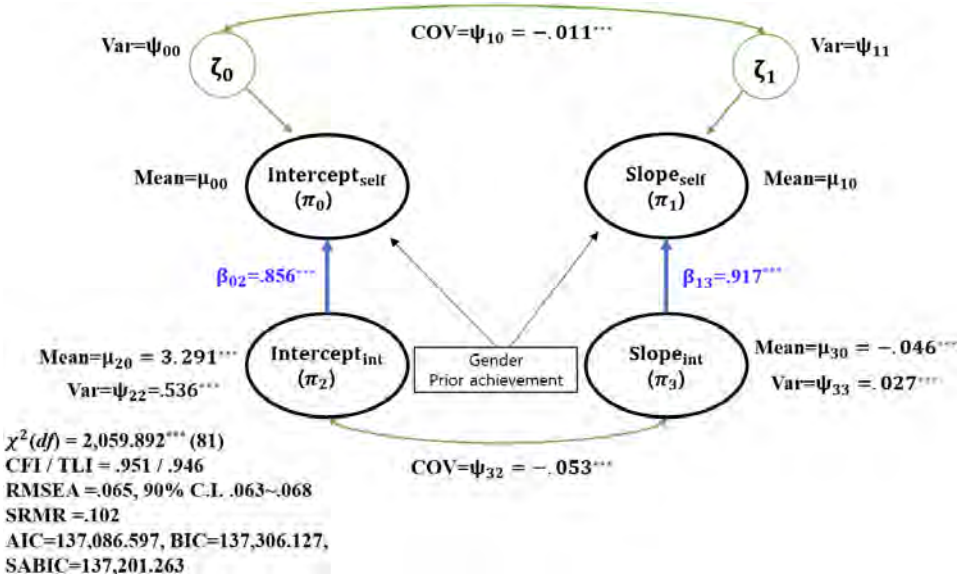
4.3. The Dynamic Relation between L2 English Interest and Self-efficacy Modeling

As shown in Figure 2, growth factors in L2 English interest can simultaneously explain growth factors in L2 English self-efficacy over time, confirming causality between the two constructs. About model fit indices, $\chi^2(df)$ was 2,059.892 (81) and statistically significant. Both CFI and TLI were 0.951, 0.946 respectively; SRMR = 0.102; RMSEA = 0.062, with a 90% CI of (0.063, 0.068). AIC was 137,086.597, BIC was 137,306.127, and SABIC was

137,201.263. Particularly, there can be unidirectional influences between growth factors of the two L2 motivational constructs. More specifically, the intercept and slope parameters of L2 English interest can positively influence the intercept and slope parameters of L2 English self-efficacy, respectively. Specifically, an increase in interest can predict an increase in self-efficacy in English learning. Such unidirectional influences provide more clear insight into potential causal processes between them during the secondary school period.

FIGURE 2

PPM with Uni-directional Effects



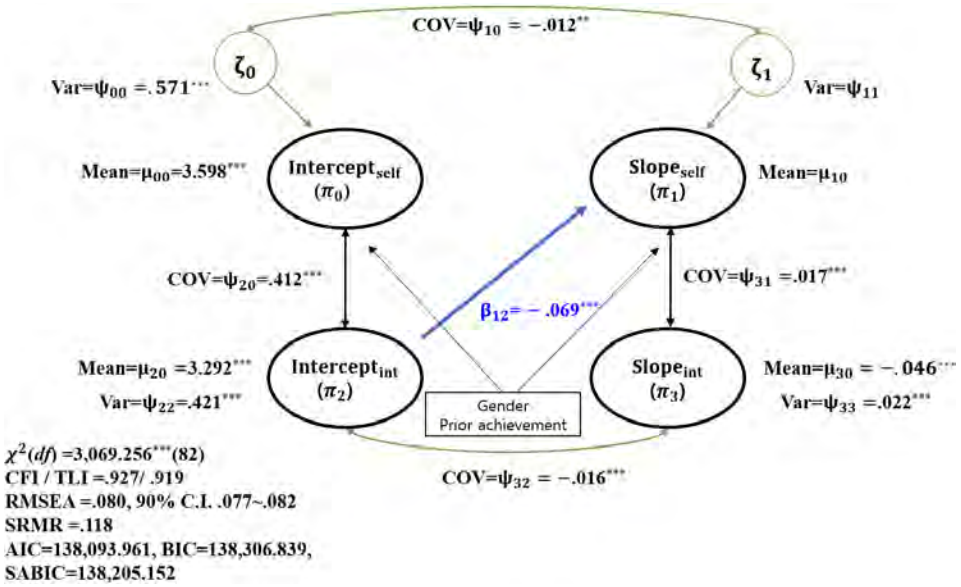
Note. Intercept = Initial level. Slope = Growth rate.
SELF = L2 English self-efficacy. INT = L2 English interest.

Furthermore, as shown in Figure 3, a cross-directional longitudinal relationship can be specified between the growth factors of two L2 motivational subdomains. Furthermore, researchers can examine if the intercept of one subdomain influences the slope in the other subdomain. In this study, the results showed that an increase in the level of L2 English interest influenced a decline in the growth rate of L2 English self-efficacy.

Statistically, this indicated a negative interaction effect between time and the intercept of L2 English interest negatively influencing the slope of L2 English self-efficacy. This negative cross-interaction effect resulted in diminishing co-developmental trends between L2 English interest and L2 English self-efficacy. Such longitudinal cross-effect can capture a cumulative effect over time; that is, we can detect that the influence of L2 English interest on L2 English self-efficacy dwindles over time.

Figure 3

PPM with a Cumulative Time Interaction Effect



Note. Intercept = Initial level. Slope = Growth rate.
SELF = L2 English self-efficacy. INT = L2 English interest.

4.4. Modelling Sequentially the Contingent Process Over Time

As the last step, as shown in Figure 4, the sequentially contingent process effect was investigated between two growth factors of L2 English interest and self-efficacy in a PPM. Specifically, changes in one construct at an earlier measurement time point (from t4 to t6 of the middle school period) can predict later changes in the other subdomain (from t7 to t9 of the high school period). A longitudinally sequential process involving L2 English interest early in middle school (t4 to t6) and L2 English self-efficacy later in high school (t7 to t9) can be specified using the PPM.

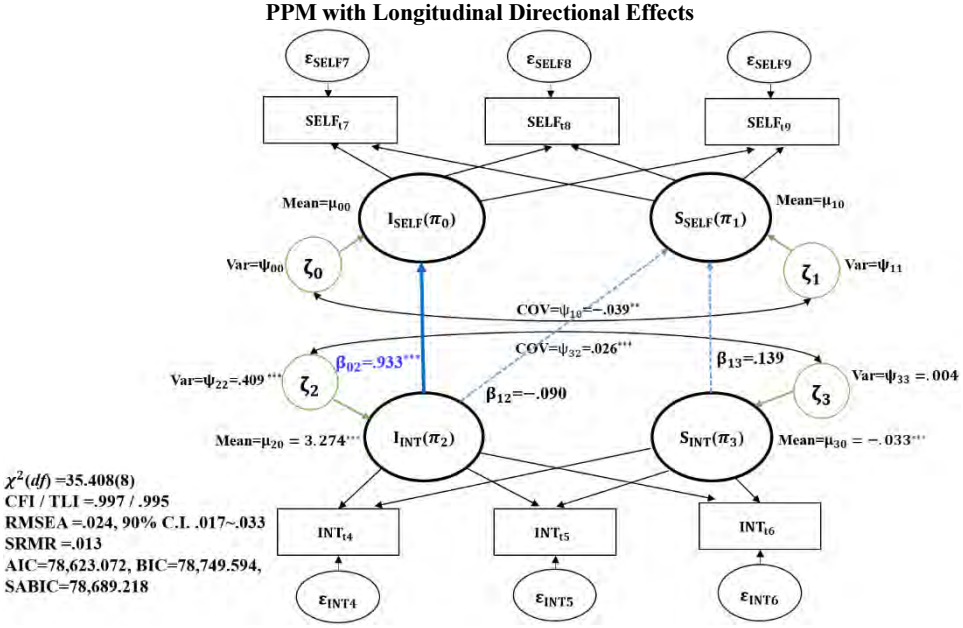
Subsequently, time-lagged intercept/slope parameters of L2 English interest were modeled to influence subsequent intercept/slope parameters of L2 English self-efficacy. The results showed that a high initial level of L2 English interest in middle school years predicted a subsequent increase in the initial level of L2 English self-efficacy in high school years. Such unidirectional longitudinal effects led us to trace sequential causal processes over time, triggering a cascade effect.

This sequential model is most suitable for a life-course study over a long time. In this sequentially contingent process model during whole adolescence, the initial level of L2 English interest in the middle school years positively influenced the initial level of L2

English self-efficacy in the high school years. Moreover, the negative cross-interaction effect from the initial level of L2 English interest in the middle school years to the growth rate of L2 English self-efficacy in the high school years is no longer significant, suggesting no negative longitudinal cross-acceleration effect.

FIGURE 4

PPM with Longitudinal Directional Effects



Note. Intercept = Initial level. Slope = Growth rate.
SELF = L2 English self-efficacy. INT = L2 English interest.

4.5. Effect of Self-efficacy Trajectories on English Achievement Over Time

The global model fit indices for the conditional model demonstrated robust fit statistics. The chi-square test, χ^2 =363.607(24), was statistically significant. Despite this, other fit indices indicated excellent model fit: both CFI and TLI were 0.978, 0.975 respectively; SRMR = 0.036; RMSEA = 0.05, with a 90% CI of (0.045, 0.054). AIC was 106,110.417, BIC was 106,243.597, and SABIC was 106,180.043.

In Table 6, the interpretation of the regression coefficients for the L2 English self-efficacy growth factors on L2 English achievement variables reveals significant insights. For the English school record, the intercept coefficient of -1.427 indicates that for each one-unit increase in the initial level growth factor of L2 English self-efficacy, there is a corresponding decrease of 1.427 units in the English school record, which indicates better grades. This suggests that students with higher initial levels of L2 English self-efficacy tend to have lower

initial levels in their English school records. Furthermore, the slope coefficient of -7.22, which is statistically significant, suggests that each one-unit increase in the growth rate of L2 English self-efficacy corresponds to a 7.22-unit decrease in the English school record over time. This implies that students experiencing a more rapid increase in their L2 English self-efficacy may see a more significant decline in their English school records.

The interpretation of the English practice test grade follows a similar pattern to that of the English school record. However, the effect size of the initial levels of L2 English self-efficacy on practice test grades is larger than that on school records. This indicates that initial self-efficacy levels have a more substantial impact on practice test performance compared to school records. On the other hand, the growth rate of L2 English self-efficacy has a steeper effect on the English school record than on the English practice test grade. This suggests that while initial self-efficacy levels are more influential for practice test grades, the rate of increase in self-efficacy more significantly affects the school record over time.

TABLE 6

Estimates of L2 English Self-efficacy growth factors on L2 English Achievements

Outcome Variables		Unstandardized Coefficients (γ)	SE	Standardized Coefficients (β)
Intercept	English school record	-1.427***	0.037	-0.597***
	English practice test grade	-1.706***	0.042	-0.674***
Slope	English school record	-7.220***	0.254	-0.578***
	English practice test grade	-5.317***	0.271	-0.401***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

5. Discussion

The present study investigated the longitudinal relations between interest and self-efficacy in a sample of South Korean adolescents. Concerning L2 motivation, the hypothesized directional relation from interest to self-efficacy was shown to be supported by the findings. Namely, we found empirical evidence for a relatively systematic pattern of unidirectional paths from interest to self-efficacy from Grades 7 to 12, controlling for students' gender and prior achievement. According to these findings, Korean adolescents who had a high level of enjoyment and importance for learning English were able to improve their English self-efficacy. Particularly, this study specified the causal developmental relations from L2 English interest to self-efficacy of secondary school students over six years in EFL contexts. The longitudinal causality from L2 English interest to self-efficacy was investigated with PPM based on the conceptual frameworks of motivation.

By drawing on a complex dynamic motivation perspective, this study aimed to examine

a conceptual framework for understanding two major L2 motivational factors with a focus on change and directional associations across time. More specifically, we tested potential causal relations posited by the theoretical framework of motivation. The results pointed to the directional dynamic by which interest enhances self-efficacy in the L2 English learning context supporting the previous research findings (Ainley et al., 2009; Bandura, 1997; Bong et al., 2015; Ganley & Lubienski, 2016; Grigg et al., 2018; Hidi & Harackiewicz, 2000; Komarraju & Dial, 2014; McIlroy et al., 2015; Nuutila et al., 2020; Pinxten et al., 2014; Renninger, 1989, 1990; Renninger & Hidi, 2002; Schiefele, 2009; Tin, 2016).

Regarding the analysis procedure, as a preliminary phase, LGCM analysis of L2 English interest and self-efficacy showed declining growth trajectories (Chouinard & Roy, 2008; Denissen et al., 2007; Hidi, 2000; Lee & Seo, 2021; Wigfield & Cambria, 2010). Besides, reciprocal correlations in basic PPM were revealed, suggesting the co-development between L2 English interest and self-efficacy (Fastrich et al., 2018; Hidi et al., 2002; Niemivirta & Tapola, 2007). The results confirmed that L2 English interest and self-efficacy represent changeable states rather than stable traits (Dörnyei et al., 2015; Oh, 2022b).

Besides, the students' L2 English interest and self-efficacy declined over a six-year secondary (middle and high) schooling period. The results implied that the students' learning enjoyment decreased during the whole secondary school years. These findings are consistent with most previous studies reporting a decrease in interest (Denissen et al., 2007; Hidi, 2000; Wigfield & Cambria, 2010). If we recognize the declining trend of interest as students progress through school, it is necessary to find new teaching or learning methods to encourage uninterested students. L2 English interest is characterized by genuine curiosity and involvement with specific learning tasks or activities. According to pedagogical practices, learning tasks should have a relevant value for students to naturally raise personal involvement and curiosity in the learning topics (Lepper & Henderlong, 2000).

More flexible teaching methods that foster students' sense of control and self-determination in their learning choices and offer appropriate challenges for students should be applied to the language learning context (Lepper & Henderlong, 2000; Sansone & Smith, 2000). During learning tasks or activities, sustaining the interest that students bring to the classroom is critical for active engagement in L2 learning, through which students can gain confidence, thus reinforcing the connections between interest and self-efficacy in SLA contexts.

Further, we need to consider the declining trend of students' L2 English self-efficacy during secondary school. This decreasing trend in student cognitive motivation of English self-efficacy in secondary schooling requires serious attention. This finding is in line with studies on primary school children in other contexts (Archambault et al., 2010; Jacobs et al., 2002; Otis et al., 2005; Phan, 2012; Schunk, 2010) and is inconsistent with the findings reported for Korean secondary school students' increase in English self-efficacy (Oh, 2022a).

To address the decline in English self-efficacy among middle school students, educators can implement several strategies. Providing mastery experiences helps students build confidence through progressively challenging tasks (Bong, Cho, Ahn, & Kim, 2012). Fostering a growth mindset encourages viewing abilities as developable with effort (Bong & Skaalvik, 2003). Offering constructive feedback focused on effort and strategies boosts self-efficacy (Britner & Pajares, 2006). Enhancing teacher-student relationships creates a supportive environment (Chen & Usher, 2013). Integrating collaborative learning offers social support (Butz & Usher, 2015), and using real-world applications makes learning more relevant and engaging.

As the most important part of this study, the results of PPM analysis showed that changes in L2 English interest predicted changes in L2 English self-efficacy over time, which could be convincing evidence of a longitudinal causal relationship between the two L2 motivational constructs. First, the initial level and growth rate of L2 English interest influenced the initial level and growth rate of L2 English self-efficacy, respectively. As a result, strong longitudinal causality from L2 English interest to L2 English self-efficacy was discovered. Specifically, increased interest can predict an increase in self-efficacy in English learning over time (Ainley et al., 2009; Arens et al., 2019; Grigg et al., 2018; Hidi & Harackiewicz, 2000; Lauermann et al., 2017; Lee & Seo, 2021; Lent et al., 2008; Nuutila et al., 2020; Tin, 2016; Viljaranta et al., 2014).

Second, the initial level of L2 English interest exhibited a negative cross-effect on the growth rate of L2 English self-efficacy. More specifically, L2 English interest and self-efficacy exhibited a negative cross-interaction over time, implying a longitudinal negative moderating effect between them. This result fully supports the negative moderated mediation effect between intrinsic motivation and self-efficacy in L2 learning (Oh, 2022b). This may be the reason why the direction of causality between the two constructs showed inconsistent results among previous conventional cross-sectional research findings.

Finally, a sequential causal effect from L2 English interest to self-efficacy was demonstrated over time. Particularly, the earlier initial level of L2 English interest in middle school showed a significant positive time-lagged effect on the later initial level of L2 English self-efficacy in high school. These results provided powerful evidence that interest longitudinally augmented self-efficacy in L2 English learning, which is consistent with theoretical perspectives, strongly supporting the existing literature (Bong et al., 2015; Hidi et al., 2002; Oh, 2022b; Renninger, 1989, 1990; Renninger & Hidi, 2002; Schiefele, 2009; Tin, 2016).

Specifically, for secondary school students learning in EFL contexts, prior interest appears to be a strong determinant of subsequent self-efficacy over time. According to SCT, one of the four major sources of self-efficacy is a positive emotional state. Bandura (1997) also acknowledged that the pleasure of enactive mastery experiences is one of the critical factors

that influence the development of perceived competence. Intuitively, people have confidence when they feel interested; this sounds reasonable because students with genuine interest can raise their confidence in L2 English learning regardless of their actual competence or proficiency. Typically, affective arousal, such as a sense of excitement or feeling of expectation, precedes the cognitive judgment or belief about something.

In this study, interest in L2, specifically English, has been empirically shown to enhance subsequent perceptions of competence among learners. This study also elucidated the sequential causal relationships within this domain, demonstrating that an initial level of interest in L2 English significantly predicts learners' subsequent self-efficacy. These findings illustrate a unidirectional, longitudinal influence whereby early interest in L2 English initiates a cascading effect, establishing a sequentially contingent developmental process. Therefore, cultivating early interest in L2 English learning is crucial, as it robustly predicts increased self-efficacy during subsequent educational phases, particularly transitioning from middle to high school. This relationship underscores the importance of early motivational interventions in language education, aiming to enhance learners' future perceived competence and overall linguistic proficiency.

L2 English self-efficacy significantly contributed to English achievement variables, underscoring its role as a crucial predictor of English success. This study aligns with previous research, revealing statistically significant positive associations between the growth of L2 English self-efficacy and English achievement. Both the initial state of L2 English self-efficacy and its rate of change over time were positively correlated with L2 learning outcomes, such as English school records and practice test grades (Demir & Okyar, 2021; Hsieh & Kang 2010; Khodadad & Kaur, 2016; Mills, et al., 2006, 2007; Oh, 2022a; Zhang et al., 2023). This suggests that as students' L2 English self-efficacy grows, their confidence in their English-learning abilities enhances their achievement. Therefore, both the initial level and the growth rate of L2 English self-efficacy have accelerated positive effects on English learning outcomes. In addition, it has been confirmed that in the highly competitive educational environment of Korea, self-efficacy also has a positive impact on academic achievement.

It is known that L2 learning is involved in ongoing practices of L2 use in the long haul. In such situations, maintaining high enough interest for continual learning engagement is critical for students to develop their language ability. Although the independent role of interest and self-efficacy in L2 learning has been well documented, the present research findings added in-depth insight into the existing motivation literature by demonstrating the longitudinal causality between L2 English interest and self-efficacy. Therefore, high sufficient interest to build strong perceptions of competence constitutes an essential prerequisite for entering L2 learning. This study helps educators and researchers to understand why or how they should initially support students' interests to build their self-

efficacy beliefs.

The significance of this study is shedding light on the dynamic causal phenomena surrounding the L2 English motivation context. The longitudinal research design improves cross-sectional studies by including an analysis of time sequencing, allowing the researcher to specify whether a given construct can be predicted by other constructs over time, which is a fundament of causal claims.

Despite inconsistent mixed research findings in the literature, the established causality from interest to self-efficacy in English learning was empirically demonstrated in this longitudinal study. The longitudinal causality among L2 motivation factors found in this study supports the designing of new language programs, which first arouse language learners' feelings of interest to build self-efficacy beliefs about English learning. Understanding how these two constructs operate causally together will inform us on how to design an intervention program that attracts more students' interest and self-efficacy in L2 learning fields.

This longitudinal study of the relationship between interest and self-efficacy among middle and high school students provides critical insights that can be strategically integrated into secondary English education. Recognizing the enduring interaction between these motivational constructs throughout secondary education emphasizes the need for curricula that actively cultivate and sustain student interest and self-efficacy over time. This approach aligns with the 2022 revised English curriculum which emphasizes socio-emotional competencies, suggesting that enhancing these motivational factors can significantly impact learning outcomes. Furthermore, the introduction of digital English textbooks offers an unprecedented opportunity to incorporate features that cater to diverse student interests and self-efficacy needs. By leveraging technology, educators can provide personalized learning experiences that adapt to individual student profiles, thereby fostering a more engaging and effective learning environment. The findings of this study not only reinforce the importance of these educational innovations but also provide a solid empirical foundation for their implementation, ensuring that they meet the evolving needs of students in a digital age.

6. Conclusion

To identify patterns of causal relations between interest and self-efficacy within the context of language learning, this study employed a longitudinal research approach using panel data (Hernán & Robins, 2020). By utilizing the PPM statistical technique, the study modeled the growth trajectories and directional effects of L2 English interest on L2 English self-efficacy over six years of secondary education. This comprehensive approach extends the understanding of how these two critical motivational constructs interact over time,

contributing significantly to both theoretical and practical aspects of language learning motivation.

The findings are particularly noteworthy as they re-examine previous studies using a distinct sample from the South Korean educational system. The study found consistent unidirectional relationships between prior interest and later self-efficacy in English among Korean adolescents. This reinforces the theoretical framework that interest is a precursor to self-efficacy and highlights the importance of fostering interest in the early stages to enhance self-efficacy later on. These insights have practical implications for educators, suggesting that early interventions to boost students' interest in English can lead to increased self-efficacy and better academic outcomes in the long run (Bong et al., 2012; Chen & Usher, 2013).

This study has several limitations despite the longitudinal approach using SEM supported by EVT, SDT, and SCT. First, the specification of directional paths in SEM requires theoretical and empirical support, as similar magnitudes of coefficients might exist in the opposite direction of effect. In SLA research, identifying these theoretical alternative explanations for causality is crucial since each potential direction of effect has different implications for intervention. Therefore, this study uses EVT, SDT, and SCT as major theoretical supports for model building.

Second, despite the representativeness of the large-scale panel sample, GEPS data in EFL settings lack sufficient details regarding respondents' learning histories and characteristics. This limitation constrains the detailed interpretation of results and the generalization of implications to other languages and cultural contexts. Incorporating multiple samples from various learner backgrounds and employing qualitative approaches would provide richer discussions and more insightful implications. From a methodological perspective, although multilevel analysis would be more appropriate for exploring longitudinal relations given the stratified sample structure, convergence issues prevented its use in this study. Additionally, the panel data covers only adolescence (Grade 7 to Grade 12), which means that earlier learning experiences may have already influenced students' interest in English by the time they entered middle school. To fully understand the causal relationship between interest and self-efficacy in adolescents' L2 English motivation development, broader longitudinal studies that follow students from younger years through adolescence across multiple subject domains are necessary.

Applicable levels: Secondary

REFERENCES

Ahmed, W., Van der Werf, G., Kuyper, H., & Minnaert, A. (2013). Emotions, self-regulated learning, and achievement in mathematics: A growth curve analysis. *Journal of Educational Psychology, 105*(1), 150-161.

Ainley, M. (2010). Interest in the dynamics of task behavior: Processes that link person and task in effective learning. In T. C. Urdan & S. A. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 235-264). London: Emerald Group.

Ainley, M., Buckley, S., & Chan, J. (2009). Interest and efficacy beliefs in self-regulated learning. In M. Wosnitza, A. S. Karabenick, A. Efklides, & P. Nenniger (Eds.), *Contemporary motivation research: From global to local perspectives* (pp. 207-228). Ashland, OH: Hogrefe & Huber.

Ainley, M., Corrigan, M., & Richardson, N. (2005). Students, tasks and emotions: Identifying the contribution of emotions to students' reading of popular culture and popular science texts. *Learning and Instruction, 15*(5), 433-447.

Ainley, M., Hidi, S., & Berndorff, D. (2002). Interest, learning, and the psychological processes that mediate their relationship. *Journal Educational Psychology, 94(3)*, 545-561.

Archambault, I., Eccles, J. S., & Vida, M. N. (2010). Ability self-concepts and subjective value in literacy: Joint trajectories from grades 1 through 12. *Journal of Educational Psychology, 102*(4)*,* 804-816.

Arens, A. K., Schmidt, I., & Preckel, F. (2019). Longitudinal relations among self-concept, intrinsic value, and attainment value across secondary school years in three academic domains. *Journal of Educational Psychology, 111*(4), 663-684.

Bai, B., Nie, Y., & Lee, A. N. (2020). Academic self-efficacy, task importance and interest: Relations with English language learning in an Asian context. *Journal of Multilingual and Multicultural Development*, *43*(5), 438-451.

Bandura, A. (1978). The self-system in reciprocal determinism. *American Psychologist, 33*(4), 344-358.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37*(2), 122-147.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In T. Urdan & F. Pajares (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Charlotte, NC: Information Age.

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*(3), 586-598.

Barron, B. (2006). Interest and self-sustained learning as catalysts of development: A learning ecology perspective. *Human Development, 49*(4), 193-224.

Benner, A. D., & Graham, S. (2009). The transition to high school as a developmental process among multiethnic urban youth. *Child Development, 80*(2), 356-376.

Bong, M., Cho, C., Ahn, H. S., & Kim, H. J. (2012). Comparison of self-beliefs for predicting student motivation and achievement. *The Journal of Educational Research, 105*(5), 336-352.

Bong, M., Lee, S. K., & Woo, Y. K. (2015). The roles of interest and self-efficacy in the decision to pursue mathematics and science. In K. A. Renninger, M. Nieswandt, & S. Hidi (Eds.), *Interest in mathematics and science learning* (pp. 33-48). Washington, DC: American Educational Research Association.

Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review, 15*(1), 1-40.

Boo, Z., Dörnyei, Z., & Ryan, S. (2015). L2 motivation research 2005-2014: Understanding a publication surge and a changing landscape. *System, 55*, 145-157.

Britner, S. L., & Pajares, F. (2006). Sources of science self-efficacy beliefs of middle school students. *Journal of Research in Science Teaching, 43*(5), 485-499.

Butz, A. R., & Usher, E. L. (2015). Salient sources of early adolescents' self-efficacy in two domains. *Contemporary Educational Psychology, 42*, 49-61.

Chen, J. A., & Usher, E. L. (2013). Profiles of the sources of science self-efficacy. *Learning and Individual Differences, 24*, 11-21.

Chouinard, R., & Roy, N. (2008). Changes in high-school students' competence beliefs, utility value and achievement goals in mathematics. *British Journal of Educational Psychology, 78*(1), 31-50.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macro theory of human motivation, development, and health. *Canadian Psychology/Psychologie canadienne, 49*(3), 182-185.

Demir, Y., & Okyar, H. (2021). A path-analytic study into foreign language enjoyment, willingness to communicate in English, self-efficacy, and academic achievement. *Excellence in Education Journal, 10*(1), 33-69.

Denissen, J. J., Zarrett, N. R., & Eccles, J. S. (2007). I like to do it, I'm able, and I know I am: Longitudinal couplings between domain-specific achievement, self-concept, and interest. *Child Development, 78*(2), 430-447.

Dörnyei, Z. (2009). The L2 motivational self system. *Motivation, Language Identity and the L2 self*, *36*(3), 9-11.

Dörnyei, Z., & Al-Hoorie, A. H. (2017). The motivational foundation of learning languages other than global English: Theoretical issues and research directions. *Modern Language Journal, 101*(3), 455-468.

Dörnyei, Z., MacIntyre, P. D., & Henry, A. (Eds.). (2015). *Motivational dynamics in language learning*. Bristol, England: Multilingual Matters.

Dörnyei, Z., & Ryan, S. (2015). *The psychology of the language learner revisited*. New York: Routledge.

Eccles, J. S. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75-146). San Francisco, CA: Freeman.

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin, 21*(3), 215-225.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology, 53*(1), 109-132.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed.) (pp. 1017-1095). Hoboken, NJ: Wiley.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Publications.

Fastrich, G. M., Kerr, T., Castel, A. D., & Murayama, K. (2018). The role of interest in memory for trivia questions: An investigation with a large-scale database. *Motivation Science, 4*(3), 227-250.

Flowerday, T., & Shell, D. F. (2015). Disentangling the effects of interest and choice on learning, engagement, and attitude. *Learning and Individual Differences*, *40*, 134-140.

Frenzel, A. C., Goetz, T., Pekrun, R., & Watt, H. M. (2010). Development of mathematics interest in adolescence: Influences of gender, family, and school context. *Journal of Research on Adolescence, 20*(2), 507-537.

Ganley, C. M., & Lubienski, S. T. (2016). Mathematics confidence, interest, and performance: Examining gender patterns and reciprocal relations. *Learning and Individual Differences, 47*, 182-193.

Graham, S. (2011). Self-efficacy and academic listening. *Journal of English for Academic Purposes, 10*(2), 113-117.

Grigg, S., Perera, H. N., McIlveen, P., & Svetleff, Z. (2018). Relations among math self-efficacy, interest, intentions, and achievement: A social cognitive perspective. *Contemporary Educational Psychology, 53*, 73-86.

Guo, J., Parker, P. D., Marsh, H. W., & Morin, A. J. S. (2015). Achievement, motivation, and educational choices: A longitudinal study. *Developmental Psychology, 51*(8), 1163-1176.

Guthrie, J. T., Wigfield, A., Humenick, N. M., Perencevich, K. C., Taboada, A., & Barbosa, P. (2006). Influences of stimulating tasks on reading motivation and comprehension. *The Journal of Educational Research, 99*(4), 232-246.

Hernán, M. A., & Robins, J. (2020). *Causal inference: What if*. Boca Raton, FL: Chapman & Hall/ CRC.

Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research, 60*(4), 549-571.

Hidi, S. (2000). An interest researcher's perspective: The effects of extrinsic and intrinsic factors on motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 311-342). San Diego, CA: Academic Press.

Hidi, S., Ainley, M., Berndorff, D., & Del Favero, L. (2007). The role of interest and self-efficacy in science-related expository writing. In S. Hidi & P. Boscolo (Eds.), *Writing and motivation* (pp. 203-217). Oxford, England: Elsevier.

Hidi, S., Berndorff, D., & Ainley, M. (2002). Children's argument writing, interest and self-efficacy: An intervention study. *Learning and Instruction, 12*(4), 429-446.

Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research, 70*(2), 151-179.

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111-127.

Hidi, S., Renninger, K. A., & Krapp, A. (2004). Interest, a motivational variable that combines affective and cognitive functioning. In D. Y. Dai & R. J. Sternberg (Eds.), *Motivation, emotion, and cognition: Integrative perspectives on intellectual functioning and development* (pp. 89-115). Mahwah, NJ: Erlbaum.

Hofer, M. (2010). Adolescents' development of individual interests: A product of multiple goal regulation? *Educational Psychologist, 45*(3), 149-166.

Honicke, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review, 17*, 63-84.

Hong, N. X., & Phan, N. T. T. (2020). Students' self-efficacy beliefs and TOEIC achievements in the Vietnamese context. *International Journal of Instruction, 13*(4), 67-86.

Hsieh, P. H. (2008). Why are college foreign language students' self-efficacy, attitude, and motivation so different? *International Education, 38*(1), 76-94.

Hsieh, P. H., & Kang, H. S. (2010). Attribution and self-efficacy and their interrelationship in the study of English as a foreign language. *Language Learning, 60*(3), 606-627.

Hu, L. T., & Bentler, P. M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological Methods, 3*(4), 424-453.

Jacobs, J. E., Lanza, S., Osgood, D. W., Eccles, J. S., & Wigfield, A. (2002). Changes in children's self-competence and values: Gender and domain differences across grades one through twelve. *Child Development, 73*(2), 509-527.

Jaekel, N. (2020). Language learning strategy use in context: The effects of self-efficacy and CLIL on language proficiency. *International Review of Applied Linguistics in Language Teaching, 58*(2), 195-220.

Katz, I., Assor, A., Kanat-Maymon, Y., & Bereby-Meyer, Y. (2006). Interest as a motivational resource: Feedback and gender matter, but interest makes the difference. *Social Psychology of Education, 9*, 27-42.

Khodadad, M., & Kaur, J. (2016). Causal relationships between integrative motivation, self-efficacy, strategy use and English language achievement. *Southeast Asian Journal of English Language Studies, 22*(3), 111-125.

Kim, S. S., Kim, Y. B., Kang, S. J., Kim, H. C., & Shin, J. H. (2007). *Korean education longitudinal study (KELS) 2005(III): Descriptive report* (RR 2007-20-1). Seoul: Korean Educational Development Institute.

Kim, D., & Lee, S. (2019). The relationship analysis among subject specific interests, self-regulated learning, learning flow and self-efficacy: Focused on middle school English education. *Asia-pacific Journal of Multimedia Services Convergent with Art, Humanities, and Sociology, 9*(3), 51-59.

Köller, O., Baumert, J., & Schnabel, K. (2001). Does interest matter? The relationship between academic interest and achievement in mathematics. *Journal for Research in Mathematics Education, 32*(5), 448-470.

Komarraju, M., & Dial, C. (2014). Academic identity, self-efficacy, and self-esteem predict self-determined motivation and goals. *Learning and Individual Differences, 32*, 1-8.

Krapp, A. (2002). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction, 12*(4), 383-409.

Krapp, A. (2007). An educational-psychological conceptualisation of interest. *Educational and Vocational Guide, 7*(1), 5-21.

Lang, K. M., & Little, T. D. (2018). Principled missing data treatments. *Prevention Science, 19*(3), 284-294.

Lauermann, F., Eccles, J. S., & Pekrun, R. (2017). Why do children worry about their academic achievement? An expectancy-value perspective on elementary students' worries about their mathematics and reading performance. *ZDM-Mathematics Education, 49*(2), 339-354.

Lee, Y. K., & Seo, E. (2021). Longitudinal relations between South Korean adolescents' academic self-efficacy and values in mathematics and English. *British Journal of Educational Psychology, 91*(1), 217-236.

Lent, R. W., Brown, S. D., & Hackett, G. (2002). Social cognitive career theory. In D. Brown (Ed.), *Career choice and development* (4th ed.) (pp. 225-311). San Francisco, CA: Jossey-Bass.

Lent, R. W., Sheu, H. B., Singley, D., Schmidt, J. A., Schmidt, L. C., & Gloster, C. S. (2008). Longitudinal relations of self-efficacy to outcome expectations, interests, and major choice goals in engineering students. *Journal of Vocational Behavior, 73*(2), 328-335.

Lepper, M. R., & Henderlong, J. (2000). Turning "play" into "work" and "work" into "play": 25 years of research on intrinsic versus extrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 257-307). San Diego, CA: Academic Press.

Linnenbrink-Garcia, L., Patall, E. A., & Messersmith, E. E. (2013). Antecedents and consequences of situational interest. *British Journal of Educational Psychology, 83*(4), 591-614.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*(404), 1198-1202.

Malureanu, A., Panisoara, G., & Lazar, I. (2021). The relationship between self-confidence, self-efficacy, grit, usefulness, and ease of use of e-learning platforms in corporate training during the COVID-19 pandemic. *Sustainability 13*(12), 6633-6653.

Mardia, K. V. (1980). 9 Tests of univariate and multivariate normality. *Handbook of Statistics, 1*, 279-320.

McEown, M. S., Noels, K. A., & Saumure, K. D. (2014). Students' self-determined and integrative orientations and teachers' motivational support in a Japanese as a foreign language context. *System, 45*, 227-241.

McIlroy, D., Poole, K., Ursavas, Ö. F., & Moriarty, A. (2015). Distal and proximal associates of academic performance at secondary level: A mediation model of personality and self-efficacy. *Learning and Individual Differences, 38*, 1-9.

Mills, N. (2014). Self-efficacy in second language acquisition. In S. Mercer & M. Williams (Eds.), *Multiple perspectives on the self in SLA* (pp. 6-22). Bristol, England: Multilingual Matters.

Mills, N., Pajares, F., & Herron, C. (2006). A re-evaluation of the role of anxiety: Self-efficacy, anxiety, and their relation to reading and listening proficiency. *Foreign Language Annals, 39*(2), 276-295.

Mills, N., Pajares, F., & Herron, C. (2007). Self-efficacy of college intermediate French students: Relation to achievement and motivation. *Language Learning, 57*, 417-442.

Muthén, L. K., & Muthén, B. O. (2019). *Mplus user's guide* (8th ed.). Los Angeles: Muthén & Muthén.

Niemivirta, M., & Tapola, A. (2007). Self-efficacy, interest, and task performance: Within-task changes, mutual relationships, and predictive effects. *Zeitschrift für Pädagogische Psychologie, 21*(3/4), 241-250.

Nolen, S. B. (2007). Young children's motivation to read and write: Development in social contexts. *Cognition and Instruction, 25*(2-3), 219-270.

Nuutila, K., Tapola, A., Tuominen, H., Kupiainen, S., Pasztor, A., & Niemivirta, M. (2020). Reciprocal predictions between interest, self-efficacy, and performance during a task. *Frontiers in Education, 5*, 36-49.

Oga-Baldwin, W. L. Q., Nakata, Y., Parker, P., & Ryan, R. M. (2017). Motivating young language learners: A longitudinal model of self-determined motivation in elementary school foreign language classes. *Contemporary Educational Psychology, 49*, 140-150.

Oh, Y. K. (2022a). The growth trajectories of L2 self-efficacy and its effects on L2 learning: Using a curve-of-factors model. *Applied Linguistics, 43*(1), 147-167.

Oh, Y. K. (2022b). A structural analysis of affective variables influencing middle school students' English achievement. *The Journal of Curriculum and Evaluation, 25*(1), 269-298.

Oh, Y. K., & Cha, S. H. (2017). Exploring structural relationships among student and school variables affecting English academic achievement in elementary schools. *The Journal of Korean Teacher Education, 34*(2), 251-279.

Otis, N., Grouzet, F. M., & Pelletier, L. G. (2005). Latent motivational change in an academic Setting: A 3-year longitudinal study. *Journal of Educational Psychology, 97*(2), 170-183.

Patall, E. A., Vasquez, A. C., Steingut, R. R., Trimble, S. S., & Pituch, K. A. (2016). Daily interest, engagement, and autonomy support in the high school science classroom. *Contemporary Educational Psychology, 46*, 180-194.

Phan, H. P. (2012). The development of English and mathematics self-efficacy: A latent growth curve analysis. *The Journal of Educational Research, 105*(3), 196-209.

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research, 31*(6), 459-470.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*(1), 33.

Pintrich, P. R., Marx, R. W., & Boyle, R. A. (1993). Beyond cold conceptual change: The role of motivational beliefs and classroom contextual factors in the process of conceptual change. *Review of Educational Research, 63*(2), 167-199.

Pinxten, M., Marsh, H. W., De Fraine, B., Van Den Noortgate, W., & Van Damme, J. (2014). Enjoying mathematics or feeling competent in mathematics? Reciprocal effects on mathematics achievement and perceived math effort expenditure. *British Journal of Educational Psychology, 84*(1), 152-174.

Renninger, K. (1989). Individual differences in children's play interest. In L. Winegar (Ed.), *Social interaction and the development of children's understanding* (pp. 147-172). Norwood, NJ: Ablex.

Renninger, K. (1990). Children's play interests, representation, and activity. In R. Fivush & K. Hudson (Eds.), *Knowing and remembering in young children* (pp. 127-165). Cambridge, England: Cambridge University Press.

Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 375-407). San Diego, CA: Academic Press.

Renninger, K. A. (2009). Interest and identity development in instruction: An inductive model. *Educational Psychologist, 44*(2), 1-14.

Renninger, K. A., Cai, M., Lewis, M., Adams, M., & Ernst, K. (2011). Motivation and learning in an online, unmoderated, mathematics workshop for teachers. *Educational Technology, Research and Development, 59*(2), 229-247.

Renninger, K. A., Ewen, L., & Lasher, A. K. (2002). Individual interest as context in expository text and mathematical word problems. *Learning and Instruction*, *12*(4), 467-491.

Renninger, K. A., & Hidi, S. (2002). Student interest and achievement: Developmental issues raised by a case study. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 173-195). San Diego, CA: Academic Press.

Renninger, K. A., & Hidi, S. (2011). Revisiting the conceptualization, measurement, and generation of interest. *Educational Psychologist, 46*(3), 168-184.

Renninger, K. A., & Hidi, S. (2016). *The power of interest for motivation and engagement*. New York: Routledge.

Renninger, K. A., & Su, S. (2019). Interest and its development revisited. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (2nd ed., pp. 205-228). Oxford, England: Oxford University Press.

Rotgans, J. I., & Schmidt, H. G. (2014). Situational interest and learning: Thirst for knowledge. *Learning and Instruction, 32*, 37-50.

Rotgans, J. I., & Schmidt, H. G. (2018). How individual interest influences situational interest and how both are related to knowledge acquisition: A microanalytical investigation. *The Journal of Educational Research, 111*(5), 530-540.

Sansone, C., & Smith, J. L. (2000). Interest and self-regulation: The relation between having to and wanting to. In C. Sansone & J. M. Harackiewicz (Eds.), *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 341-372). San Diego, CA: Academic Press.

Schiefele, U. (1991). Interest, learning, and motivation. *Educational Psychologist, 26*(3-4), 299-323.

Schiefele, U. (2009). Situational and individual interest. In K. R. Wenzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 197-222). New York: Routledge.

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist, 26*(3-4), 207-231.

Schunk, D. (2010). Self-efficacy beliefs. In S. Järvelä (Ed.), *Social and emotional aspects of learning* (pp. 436-442). London: Elsevier.

Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications* (4th ed.). Upper Saddle River, NJ: Merrill Prentice Hall.

Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation in education: Theory, research, and applications* (3rd ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.

Silvia, P. J. (2003). Self-efficacy and interest: Experimental studies of optimal incompetence. *Journal of Vocational Behavior, 62*(2), 237-249.

Silvia, P. J. (2005). What is interesting? Exploring the appraisal structure of interest. *Emotion, 5*(1), 89-102.

Smith, S. A., Kass, S. J., Rotunda, R. J., & Schneider, S. K. (2006). If at first you don't succeed: Effects of failure on general and task-specific self-efficacy and performance. *North American Journal of Psychology, 8*(1), 171-182.

Talsma, K., Schuz, B., Schwarzer, R., & Norris, K. (2018). I believe, therefore I achieve (and vice versa): A meta-analytic cross-lagged panel analysis of self-efficacy and academic performance. *Learning and Individual Differences, 61*, 136-150.

Tanaka, A., & Murayama, K. (2014). Within-person analyses of situational interest and boredom: Interactions between task-specific perceptions and achievement goals. *Journal of Educational Psychology, 106*(4), 1122-1134.

Tin, T. B. (2016). *Stimulating student interest in language learning: Theory, research and practice*. London: Palgrave Macmillan.

Thompson, G., Aizawa, I., Curle, S., & Rose, H. (2022). Exploring the role of self-efficacy beliefs and learner success in English medium instruction. *International Journal of Bilingual Education and Bilingualism, 25*(1), 196-209.

Trautwein, U., Marsh, H. W., Nagengast, B., Lüdtke, O., Nagy, G., & Jonkmann, K. (2012). Probing for the multiplicative term in modern expectancy-value theory: A latent interaction modeling study. *Journal of Educational Psychology, 104*(3), 763-777.

Truong, T. N. N., & Wang, C. (2019). Understanding Vietnamese college students' self-efficacy beliefs in learning English as a foreign language. *System, 84*, 123-132.

Tulis, M., & Ainley, M. (2011). Interest, enjoyment, and pride after failure experiences? Predictors of students' state-emotions after success and failure during learning in mathematics. *Educational Psychology, 31*(7), 779-807.

Usher, E. (2015). Personal capability beliefs. In L. Corno & E. M. Anderman (Eds.), *Handbook of educational psychology* (3rd ed.) (pp. 146-159). New York: Taylor & Francis.

Usher, E. L., & Pajares, F. (2009). Sources of self-efficacy in mathematics: A validation study. *Contemporary Educational Psychology, 34*(1), 89-101.

Ushioda, E., & Dörnyei, Z. (2017). Beyond global English: Motivation to learn languages in a multicultural world. *Modern Language Journal, 101*(3), 451-454.

Viljaranta, J., Tolvanen, A., Aunola, K., & Nurmi, J. E. (2014). The developmental dynamics between interest, self-concept of ability, and academic performance. *Scandinavian Journal of Educational Research, 58*(6), 734-756.

Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes. *Developmental Review, 30*(1), 1-35.

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25,* 68-81.

Wigfield, A., Tonks, S., & Klauda, S. L. (2009). Expectancy-value theory. In K. R. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 55-76). New York: Routledge Taylor & Francis Group.

Yoon, M. S., & Kim, S. I. (2003). A study on constructs of subject-specific interests and its relationship with academic achievement. *The Korean Journal of Education Psychology, 17*(3), 271-290.

Zhang, L., Jiang, Y., & Chen, S. (2023). Longitudinal interrelations among self-efficacy, interest value, and effort cost in adolescent students' English achievement and future choice intentions. *Contemporary Educational Psychology, 73*, 102-176.

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal, 31*(4), 845-862.