

Incremental Theory of Intelligence and Writing Performance of Iranian IELTS Candidates

Hamed Ghaemi^{1*}, Farina SaeidRezaei²

ARTICLE INFO	ABSTRACT
<p>Article History: Received: August 2023 Accepted: September 2023</p>	<p>Incremental intelligence plays an important role in self-regulating and enhancing writing performance among language learners. The present study aimed to investigate the relationship among variables of the incremental theory of intelligence, self-regulatory writing strategies, implicit theory of writing, and writing performance in EFL learners. To do so, 320 Iranian IELTS candidates were invited to participate in the study. Three questionnaires, namely incremental intelligence, self-regulatory writing strategy, and implicit theory of writing, were utilized. The participants included male and female IELTS candidates aged 19-27 years with a minimum band score of 6.5 in their writing skill. Furthermore, their educational qualifications included BA and MA degrees. The collected data were analyzed using SPSS and structural equation modeling (SEM). The correlation analysis showed that the incremental theory of intelligence had a significant relationship with self-regulatory writing strategy, implicit theory of writing, and writing performance. Moreover, the obtained results of SEM confirmed the findings of the correlational analysis, indicating statistically significant positive correlations among the variables of the study. The findings revealed that a growth-oriented mindset could affect students' use of four types of self-regulatory writing strategies. Self-regulatory writing strategies also played a pivotal role in guiding, stimulating, motivating, and sustaining learners' efforts, thus predicting writing performance. The results of this study can help EFL learners learn how to regulate and manage themselves in writing skills. Learners can assess the extent of their professionalism and endeavor to identify their weaknesses in the learning process.</p>
<p>KEYWORDS IELTS Implicit theory of writing Incremental theory of intelligence Self-regulatory writing strategies writing performance</p>	

1. Introduction

In recent years, there has been a growing interest in the concept of intelligence, in particular incremental intelligence, which is thought to have an effect on an individual's self-esteem. For example, individuals who adhere to entity theory, believing that intelligence is fixed, typically derive satisfaction from demonstrating relative ability (Dweck & Leggett, 1988). In contrast, incremental theorists, who believe intelligence is malleable, tend to find fulfillment in mastering skills (Dweck & Leggett, 1988).

Implicit theories, or the concept of mindsets, refer to individuals' beliefs about the malleability of human traits, such as intelligence, leadership, and personality (Dweck, 2000). According to Dweck et al. (2008), implicit theories of intelligence (ways of thinking) affect how students learn. In this context, the idea of implicit theories (mindsets) of intelligence had been proposed to examine learners' beliefs about the malleability of their intelligence. These beliefs form a meaning system that leads to

¹ Bahar Institute of Higher Education, Mashhad, Iran. Email: ghaemiacademy@gmail.com

² Bahar Institute of Higher Education, Mashhad, Iran. Email: fsaeidrezaei@gmail.com

adaptive or maladaptive patterns in learning engagement (Dweck, 2000). Learners with a growth mindset (incremental theory of intelligence) believe that their intelligence can develop through constant and persistent effort and appropriate strategies, while learners with a fixed mindset (entity theory of intelligence) believe that intelligence is a fixed entity and cannot develop without the efforts made by individuals. People who adhere to incremental theories of intelligence set learning goals, strive to improve their skills, and focus on the effort in their pursuits. On the other hand, individuals following entity theories tend to pursue performance goals, focusing on achieving positive outcomes and avoiding negative ones (Elliott & Dweck, 1983; Dweck, 1999). Therefore, growth and fixed mindsets are motivational beliefs that could affect L2 writing (Papi et al., 2020).

Moreover, there exists a notable connection between these mindset theories and self-regulatory writing strategies. Such strategies are self-initiated thoughts, feelings, and actions that writers employ to achieve their literacy objectives (Zimmerman & Risemberg, 1997). Self-regulatory writing strategies enable learners to achieve active, self-directed participation in learning (Wenden & Rubin, 1987), particularly in writing (Teng, 2021). Learners' ability to select and organize information, rehearse materials, allocate memory resources, and evaluate the learning process puts them in control of information processing and could thus improve learning (O'Malley & Chamot, 1990). Another study that investigated self-regulated writing strategies in relation to learners' active participation in their writing processes depicted their importance for academic success and future career development (Zimmerman, 2002). Regarding the predictive power of SRL writing strategies, self-regulatory writing strategies affect writing performance (De Silva & Graham, 2015) and significantly predict students' writing proficiency (Sun & Wang, 2020). Self-regulatory writing strategies also affect self-efficacy (Graham et al., 2005).

Besides incremental intelligence and self-regulatory writing strategies, another variable is the implicit theory of writing. Humans organize their world based on systems of meaning that emerge from their basic assumptions or implicit theories about the nature of the self and the social world (Molden & Dweck, 2006). Implicit theories have been studied extensively in the field of intelligence, noting that individuals hold different implicit theories about the nature of their intellectual abilities (Dweck & Leggett, 1988). People, who hold an entity theory, view intelligence as a fixed unit that could not be changed, while people who hold an incremental theory view it as an increasing quality that could be developed. Few studies have shown that implicit theories affect academic performance in challenging situations by creating different motivational frameworks for goals and learning patterns (Baird et al., 2009; Blackwell et al., 2007; Dweck, 1986; Robins & Pals, 2002). Fixed or incremental skill was likely to affect the way students experience and respond to writing instruction. Supporting an entity theory of writing could be detrimental to the process of learning to write. On the contrary, supporting an incremental theory of writing could set in motion a set of adaptive thoughts and behaviors that form the basis of writing competency (Pressley & Harris, 2006).

In this regard, another variable, known as writing performance, is considered in the current study. Generally, writing is claimed to be a challenging skill for EFL students, particularly IELTS candidates, as well as the teachers' critical concern in preparation courses (Mohammadi et al., 2023). This skill may well be affected by other factors, such as self-regulatory writing strategies, implicit theories of writing, and incremental theory of intelligence. Writing requires not only knowledge of grammar, genre, and vocabulary but also the ability to self-regulate one's learning (Graham & Harris, 2000; Zimmerman & Risemberg, 1997). In recent years, researchers have discussed several factors (e.g., intelligence and instructional attitudes) that affected students' writing and self-regulated writing strategies (Harris et al., 2012; Karlen et al., 2014). One possible factor is whether students' implicit theories about human characteristics (e.g., intelligence and ability) are fixed or malleable. Research has shown that when students believe traits are malleable, they take on challenging tasks, persevere in the face of difficulties, and try different strategies (Chen & Pajares, 2010; Dweck & Master, 2008; Job et al., 2015).

Concerning the aforementioned introduction, the investigation of the relationship among the variables of the current study seemed to be of cardinal importance. Hence, the following research questions were formulated.

Q1. Is there any statistically significant relationship between incremental intelligence, self-regulatory writing strategies, implicit theory of writing, and IELTS writing test scores of Iranian IELTS candidates as measured by Structural Equation Modeling?

Q2. What is the best model to describe the relationship between incremental intelligence, self-regulatory writing strategies, implicit theory of writing, and IELTS writing test scores?

Q3. Which independent variable (incremental intelligence, self-regulatory writing strategies, implicit theory of writing) contributes most to IELTS candidates' writing test scores?

2. Review of Literature

2.1. Incremental Theory of Intelligence

Students with an incremental intelligence mindset tend to believe that skills are malleable and emphasize mastery goals in learning. They view ability as a dynamic function that can be improved through increased effort and mastery of skills (Dweck & Leggett, 1988; Hong et al., 1999; Post & van der Molen, 2021; Wang et al., 2010). When individuals do not achieve the expected level of performance, they attribute the failure to a lack of effort rather than incompetence. In addition, they view poor performance as irrelevant to the success goals they pursue and do not refute them. Therefore, they do not experience negative self-evaluation since they do not view failure as a refutation of their abilities, but rather as motivation to overcome what they need to master in order to develop their abilities further. The belief that intelligence can be developed tends to divert students' attention from negative outcomes and negative self-evaluations and instead focuses on efforts to overcome setbacks. An incremental intelligence (i.e., growth) mindset provides greater resilience after academic failure, as it has been found to direct students' mental attention toward correcting their errors or corrective solutions in neuroscience studies (Mangels et al., 2006; Moser et al., 2011). Students who believe in incremental intelligence invest more effort in rectifying their mistakes and improving their performance compared to those with a fixed mindset (Nussbaum & Dweck, 2008; Schroder et al., 2014; Yan et al., 2014).

2.1.1. Fixed Mindset (Entity Theory)

Implicit theories of intelligence are divided into two groups. The first group is the entity theory of intelligence, which pertains to students holding a fixed mindset and believes that intelligence cannot develop and increase through effort (Papi et al., 2020). According to Dweck et al. (2008), implicit theories of intelligence affect students' learning behaviors. When learners apprehend that their intelligence is fixed, they often feel the need to affirm their innate abilities through performance. Lou and Noels (2016) further proposed that students can improve their language abilities through efforts and appropriate use of strategies.

The seminal work of other researchers (Blackwell et al., 2007; Dweck, 1999; Dweck & Master, 2008; Hong et al., 1999) involves learners' implicit beliefs about the nature of intelligence associated with their approaches and ultimate success in intellectually challenging tasks (e.g., acquiring new knowledge and skills). People with entity theories often prioritize achieving specific goals with a focus on attaining positive outcomes while avoiding negative ones. Entity theories can have their advantages and may be beneficial in certain situations or for particular individuals. For instance, entity theories can increase performance when individuals are confident of their high skill levels (Dweck et al., 1995). Individuals with a more fixed mindset tend to attribute failure to a lack of skills, approach tasks with the goal of surpassing others (rather than mastering the task), and view their skills as fixed and set in stone (Dweck & Leggett, 1988). There are two types of entity ability, namely entity/high perceived ability and entity/low perceived ability. They are both pursued by students identified as entity theorists. As entity theorists do not believe that intelligence can be increased, their goals in completing academic tasks focus on their performance. These students generally aim to either receive positive evaluations or avoid being seen as incompetent. The nature of performance goal entity theorists depends on whether they believe they are sufficiently skilled for the task (Dweck, 1999; Elliott & Dweck, 1983).

When entity theorists have a high assessment of their ability on a particular academic task, they are more likely to put more effort into tackling a difficult academic task. In this case, entity theorists can use their preoccupation with positive evaluation to their advantage. This enables them to avoid negative study results due to a strong need for external academic validation. On the other hand, when entity theorists have a low assessment of their ability to approach an academic task, their main goal is

to choose easy tasks to avoid failure and negative evaluations. When faced with academic challenges, they may react with avoidance since failure to others can be a sign of poor academic ability, and failure at high levels of effort is even more indicative of poor ability. Compared to entity theorists with high notions of ability, students with low notions of ability are more likely to use maladaptive learning strategies (e.g., procrastination before an exam or withdrawing effort) in the face of academic obstacles (Dweck, 1999; Elliott & Dweck, 1983).

2.1.2. Growth Mindset (Incremental Theory)

Incremental theory of intelligence is associated with learners who have a growth mindset, signifying their belief that they can enhance their intelligence through their efforts (Papi et al., 2020). According to Dweck et al. (2008), implicit theories of intelligence influence students' learning behavior. When learners apprehend that their intelligence can grow by effort, they tend to be less concerned about how their abilities will be measured and are more focused on improving their abilities. Accordingly, learners who are identified with these beliefs are often described as adherents to incremental theories of intelligence. Incremental theorists respond more adaptively to challenges since they believe they can make extra effort to enhance their future performance.

Malleability implies that hard work and effort can improve one's abilities. It is important to note that this perspective does not imply that endless hard work makes someone Einstein or that effort has no bearing on someone's achievement (Dweck, 1999). Instead, it underscores the idea that effort and strategic approaches can lead to improvements in one's skills and abilities. Interventions focused on promoting malleability may be particularly advantageous for individuals who have ample room to develop their skills rather than those who are strong in their skills. Highly skilled individuals may have limitations on the additional effort they can invest due to their already advanced abilities. For incremental theorists, their intellectual faculties are malleable and can be enhanced through effort and different strategies. The failure of an intellectual task is, therefore, not threatening but signals the need for increased effort or the use of a different strategy. Success, in this context, implies that you have to put in more effort to complete the demanding academic task. Failure after hard work is not a sign of a skills deficit but rather an academic challenge where knowledge and experience can be gained (Dweck, 1986).

Dweck's social-cognitive model of achievement motivation highlights that the incremental theory of intelligence is closely linked to beliefs about the nature of intelligence and specifically whether it is viewed as fixed or malleable. Such core beliefs contribute to the interpretation of event outcomes, one's response to those outcomes, and the ability to regulate learning behavior. In particular, they affect the coping and learning strategies that students can use after academic failure (Dweck, 2006).

2.2. Writing Skill in IELTS

IELTS, as an International English Language Testing System, offers a test that measures an individual's proficiency in the English language across the globe. Owing to the significance of IELTS around the world, and the high request of individuals for taking it, there is a demand to teach it efficiently. One of the main and thought-provoking parts of the IELTS exam is writing, which needs to be taught appropriately (Babamoradi et al., 2018).

2.2.1. Implicit Theory of Writing

Implicit theories are closely tied to students' beliefs about the nature of their intelligence (Dweck & Master, 2009). Students who advocate an entity theory believe that intelligence is a fixed, innate attribute, while students who advocate an incremental theory believe that intelligence is a malleable attribute that can be developed over time through hard work and effort. Implicit theories can be domain-specific. For instance, a student might believe that skills in one academic area, such as writing, can be developed (incremental), while skills in another domain, like math, are perceived as innate (Dweck & Master, 2009). Confirming different implicit theories (entity vs. incremental) leads to different motivational meaning systems, which in turn can affect performance, self-esteem, and stress over time (Dweck & Molden, 2017).

Few studies have examined the relationships between implicit theories and student writing performance (Camacho et al., 2021). As indicated by Gunderson et al. (2017), implicit theories are not

significantly related to self-reported reading and writing grades, while another study revealed that students who supported incremental theories in writing performed better in an opinion essay (Limpo & Alves, 2017). In recent decades, the study of writing has primarily focused on cognitive and sociocultural approaches (Boscolo & Hidi, 2007; Graham, 2018) that have been more or less orthogonal (Deane, 2018). With the aim of bringing both perspectives together, Graham (2018) developed the Writer(s)-within-community model. In this model, writing is conceptualized as simultaneously shaped and constrained by context, the skills and perceptions of writers and collaborators, and the interaction between the two (Graham, 2018).

2.2.2 Writing Performance

Writing is a particularly complex and demanding activity because it requires the simultaneous coordination of multiple cognitive and linguistic processes, such as attention, working memory, long-term memory resources, and mental and physical operations involved in text production (Graham, 2018; Graham et al., 2013; Khalavi, 2023; Ramezani et al., 2023). Consequently, the complexity of the writing process creates motivational challenges for students (Bruning & Horn, 2000). Writing as a conscious and self-directed activity involves the intelligent use of a variety of mental operations and skills to meet the author's goals and the reader's needs (Graham, in press b). As Hayes and Flower (1980) reported, experienced writers are like very busy telephone operators who are simultaneously attempting to fulfill a variety of demands on their attention (e.g., making plans and drawing ideas from memory) and developing concepts or a picture of the reader. In fact, skilled writing does not just unfold automatically and effortlessly like a well-learned motor skill. Writing anything but the most routine and shortest plays is the mental equivalent of trench digging (Kellogg, 1993), which involves high levels of self-regulation, cognitive effort, and attentional control (Graham & Harris, 2003). Writing is not a product-oriented process or linguistic knowledge-oriented process. Success in writing depends on the understanding and belief of students in employing various writing strategies such as planning, goal setting, drafting, evaluating, revising, and editing (Hughes et al., 2019).

3. Method

3.1. Participants and Setting

The study comprised a total of 320 participants within the age range of 19-27 years, who were selected from various institutes in Iran. Specifically, a subset of colleges and institutes that offered IELTS courses was chosen for the final sampling. The selected students from these institutions were invited to participate in the study and complete the questionnaires.

3.2. Instrumentation

3.2.1 Incremental Theory of Intelligence Questionnaire. The first questionnaire was the incremental theory of intelligence developed by Dweck (1999). This questionnaire explores the students' ideas about intelligence. They could specify the extent to which they agree or disagree. The reliability index of this questionnaire, as reported by Dweck (1999), was .91. This questionnaire measures the implicit theory of intelligence, including both incremental theories of intelligence (growth mindset) and entity theories of intelligence (fixed mindset). The items are answered on a five-point scale ranging from 1 (strongly agree) to 5 (strongly disagree). The complete scale contained four incremental theory and four entity theory items and assessed common beliefs about the fixedness vs. malleability of intelligence. The self-theoretical version of the intelligence theory scale was based on the original measurement by Dweck and colleagues (Dweck, 1999). All eight items were reworded so that each statement reflected a first-person statement about the extent to which intelligence is fixed or malleable. A sample item for general beliefs of an entity theory (fixed mindset) was "*You have a certain amount of intelligence, and you can't really do much to change it*". For the incremental intelligence (growth mindset) items, a sample statement could be "*No matter who you are, you can significantly change your intelligence level.*" Moreover, a sample item for self-theoretical beliefs of entity theory (fixed mindset) was "*I don't think I personally can do much to increase my intelligence*", and for the incremental intelligence (growth mindset) item was "*I believe I can always substantially improve on my intelligence.*"

3.2.2 Self-Regulatory Writing Strategies Questionnaire. The second instrument of the study, called self-regulatory writing strategies, was developed by Le Cessie and Van Houwelingen (1992), with a reliability index of .89. This questionnaire helps the researcher to understand the learners' metacognitive development. Participants should only determine their personal opinions. Thus, there was no right or wrong answer. The questionnaire had six dimensions, including writing planning, goal-oriented monitoring, goal-oriented evaluation, emotional control, memorization, and metacognitive judgment. The sample items included: writing planning: "I think about how much time I should spend on each part of the essay," goal-oriented monitoring: "I set up goals to check my writing activities or exercises," goal-oriented evaluation: "I evaluate what I have learned from the writing activities or exercises," emotional control: "I tell myself not to worry when taking a writing test," memorization: "I memorize key sentences for my writing," metacognitive judgment: "I believe that it is important to complete the writing exercises by myself". In this questionnaire, the items were rated on a five-point Likert scale ranging from strongly agree to strongly disagree.

3.2.3. Implicit Theory of Writing Questionnaire. The other questionnaire was the implicit theory of writing developed and validated by Maag Merki et al. (2013) with a reliability index of .93. This questionnaire contains scenarios related to the writing of an essay, becoming familiar with the topic, finishing up the task, and drawing conclusions. A sample item of this questionnaire was "I read a book or article that provides a general introduction to the topic." Learners could rate the usefulness of each strategy to the requirements of the given scenario on a six-point Likert scale ranging from not at all useful to very useful.

3.2.4. IELTS Writing Test. The last instrument utilized in the study was task 2 of the IELTS writing test, taken from Cambridge IELTS 17 Academic Module. This particular test was chosen because it is a standardized component that is consistent across all IELTS Modules. This test was used to assess IELTS candidates' writing ability and scores.

3.3. Procedure

3.3.1. Data Collection and Analysis. The participants were chosen from the institutes or colleges offering IELTS courses. The participants consisted of male and female students, ranging in age from 19 to 27 years, with the primary objective of achieving at least 6.5 in their writing skill. Additionally, the participants had educational backgrounds of BA and MA degrees. To facilitate data collection, the researchers administered three questionnaires to the participants, distributed across two separate days. This decision was made to prevent the process from becoming overly tiresome and exhausting for the participants. On one day, the participants completed two of the questionnaires, and on another day, they responded to the remaining questionnaire. Each session for completing the questionnaires lasted between 30 and 45 minutes due to the brevity of the questionnaires. When the course was over, the participants took the IELTS writing test selected from the Cambridge IELTS 17 Academic Module.

Table 1
Descriptive Statistics for Participants' Demographic Information

		Frequency	Percent
Gender	Male	120	37.5
	female	200	62.5
	Total	320	100
Education level	BA	235	73.4
	MA	85	26.6
	Total	320	100
	Minimum	Maximum	Mean \pm Std. Deviation
Age	19	27	23 \pm 0.33

Table 1 shows participants' demographic information, including gender, educational level, and age. As can be seen, 37.5% of the participants were male, and 62.5% were female. Moreover, 73.4% had a bachelor's degree, and 26.6% had a master's degree. The minimum and maximum of the participants' age were 19 and 27 years, respectively, and the average age was 23 years.

4. Results

The present research was designed as a correlational study to assess the relationship of four variables, including incremental theory of intelligence, self-regulatory writing strategies, implicit theory of writing, and writing performance. At the beginning, the descriptive statistics and normality of data were analyzed. The Pearson- Product moment correlation was utilized to measure the relationship of variables and the kinds of correlation.

In conducting statistical analyses, selecting the right method is a crucial initial step. It relies on an understanding of the data distribution. In this study, it was determined that the significance level for all variables exceeded 0.05, suggesting that the data followed a normal distribution. Consequently, parametric methods were deemed appropriate for testing the research hypotheses (Table 2). This choice of parametric methods is based on the assumption that the data conforms to a normal distribution, which is essential for accurate statistical analyses.

Table 2
One Sample Kolmogorov Smirnov Test

	N	Kolmogorov- Smirnov Z Asymp	Sig. (2-tailed)
IELTS writing test scores	320	0.789	0.128
Incremental intelligence	320	1.154	0.139
Self-regulatory writing strategies	320	1.294	0.538
Implicit theory of writing	320	1.061	0.210

4.1. Results of the First Research Question

The first research question aimed to examine the relationships among the investigated variables of incremental intelligence, self-regulatory writing strategies, implicit theory of writing, and IELTS writing test scores. These relationships were measured by SEM. Figures 1 and 2 show the path coefficients and t-statistic values to examine the structural relationships among the variables.

Figure 1.
Path Coefficients of the Investigated Variables

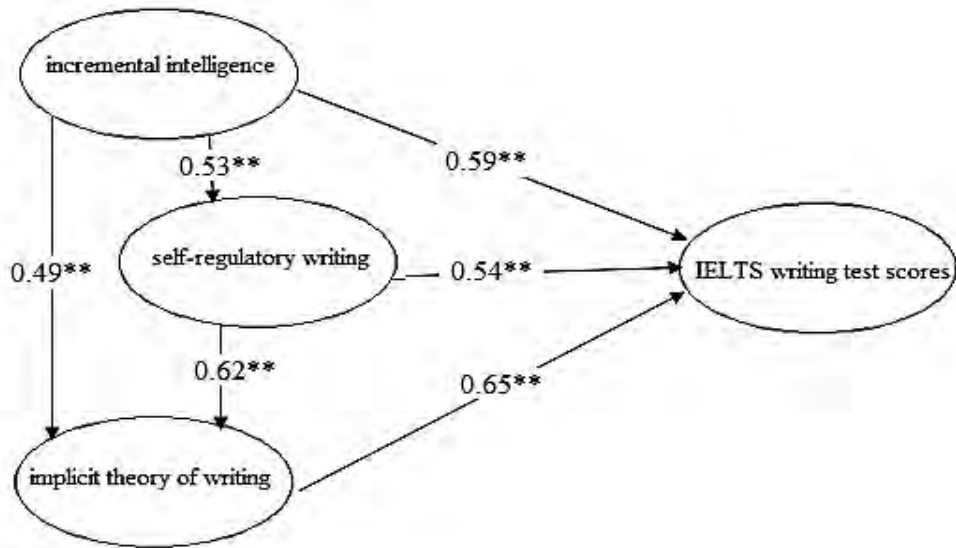


Figure 2.
T-value of the Investigated Variables

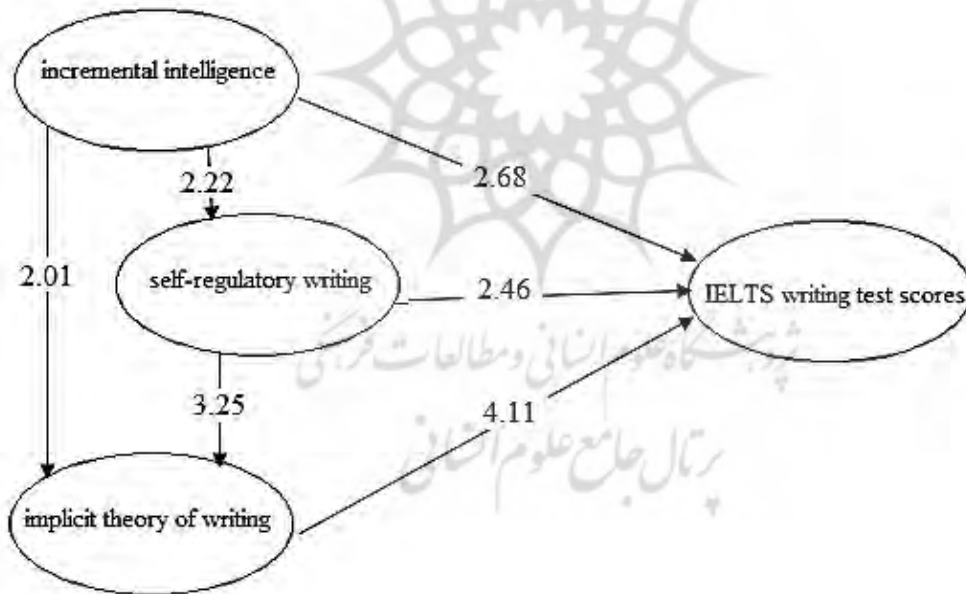


Table 3 shows the path coefficients and t-values of the investigated variables in the current study.

Table 3.
Results of SEM

Relationships examined	Path Coefficients	t-value	Result
Incremental intelligence → IELTS writing scores	0.59	2.68	Statistically significant
Incremental intelligence → self-regulatory writing	0.53	2.22	Statistically significant
Incremental intelligence → implicit theory of writing	0.49	2.01	Statistically significant
Self-regulatory writing → implicit theory of writing	0.62	3.25	Statistically significant
Self-regulatory writing → IELTS writing test scores	0.54	2.46	Statistically significant
Implicit theory of writing → IELTS writing test scores	0.65	4.11	Statistically significant

As can be seen in Table 3, the path coefficient between incremental intelligence and IELTS writing test scores equaled 0.59, a positive value. The corresponding t-statistic value was 2.68, so it can be concluded that this path coefficient was significant at the level of 0.05, and there was a significant and direct relationship (positive) between incremental intelligence and IELTS writing test scores.

The ability to write effectively can be linked to a critical component of incremental intelligence known as goal-orientation. Goal orientation refers to the types of goals that students set in learning situations (Dweck & Elliot, 1983). Students with sufficient goal orientation pursue academic assignments to increase their competency. As they set mastery goals, they seek challenging learning opportunities, regardless of whether they rate their ability as high or low. For these students, academic challenges are met with persistence and viewed as an opportunity for knowledge acquisition (Dweck, 1999). Likewise, when individuals with a growth mindset and learning goals face challenging writing tasks, they adapt their behavior to achieve desired writing outcomes within their competency. Moreover, incremental intelligence could impact learning strategies, performance, self-esteem, and stress over time (Dweck & Molden, 2017). Therefore, this significant factor could affect writing performance and enhance writing test scores.

Moreover, the path coefficient between incremental intelligence and self-regulatory writing strategy equaled 0.53, a positive value. The t-statistic value was calculated as 2.22; therefore, it can be concluded that this path coefficient was significant at the error level of 0.05. Moreover, there was a significant and direct relationship (positive) between incremental intelligence and self-regulatory writing strategy. One of the potential influencing factors on self-regulatory writing strategies was the growth mindset (e.g., Mrazek et al., 2018; Waller & Papi, 2017). In terms of implications for self-regulation, growth mindsets are promising means of facilitating self-regulation, especially in a context that requires continuous learning efforts. Individuals with a growth mentality, in particular, could change the way they perceive and invest effort, encouraging perseverance and continued commitment to worthwhile goals (Mrazek et al., 2018). As Limpo and Alves (2017) reported, growth mindsets are related to mastery of learning goals and self-efficacy in writing. Furthermore, four types of self-regulatory writing strategies, including cognitive, metacognitive, social behavior, and motivational

regulation strategy, affect the growth mindset (incremental intelligence). Therefore, self-regulated behavior encourages students to stay focused on the task while writing and significantly impacts the development of writing skills (Garcia-Sanchez & Fidalgo-Redondo, 2006).

As can be seen, the path coefficient between incremental intelligence and the implicit theory of writing was 0.49, a positive value. The corresponding t-statistic value was 2.01, so there was a significant and direct relationship (positive) between incremental intelligence and the implicit theory of writing. Advocating an incremental writing theory could set adaptive thoughts and behaviors at the root of literacy. In case students believe that their writing ability could be cultivated, they would work hard and look for constructive strategies to improve it (Pressley & Harris, 2006), confirming the significant relationship between incremental intelligence and the implicit theory of writing.

The path coefficient between self-regulatory writing strategies and implicit theory of writing was 0.62, indicating a positive value. The corresponding t-statistic value stood at 3.25, exceeding 1.96. As a result, self-regulatory writing strategies had a significant and direct positive relationship with the implicit theory of writing. This suggests that students who do not view writing as a gift (operationalized as a belief that writing can be learned or taught, in terms of a malleable theory) had higher levels of confidence in achieving writing skills, lower levels of writing comprehension, and higher-level self-assessment of their previous writing skills (Palmquist & Young, 1992). Implicit theories influence how students approach writing. There is a relationship between implicit writing theories and components of self-regulated writing strategies (Hammann, 2005). The malleable theory of academic writing ability is positively associated with self-reported use of cognitive and metacognitive strategies. Students with a malleable theory of their writing ability boost the quality of their writing more than students with a more fixed theory. The effect might be mediated by higher self-regulated writing strategy competencies or a greater willingness to improve writing skills through strategic behavior (Limpo & Alves, 2014). Another positive value (0.54) could be observed for the path coefficient between self-regulatory writing strategies and IELTS writing test scores of Iranian IELTS candidates. Therefore, a significant and direct relationship (Positive) could be confirmed between self-regulatory writing strategies and the IELTS writing test scores of Iranian IELTS candidates.

This has subsequently shown a significant difference between self-regulatory writing strategies and IELTS writing test scores of Iranian IELTS candidates. Seven strategies (text processing, planning, monitoring, evaluating, feedback handling, emotional control, and motivation) in self-regulatory writing strategies could affect writing performance. These strategies predict EFL students' writing proficiency (Teng & Zhang, 2016). Self-regulatory strategies could act as changing factors, leading to strategic adjustments in writing behavior (Graham & Harris, 2000). When learners realize how to reflect on their work, they can use these processes to improve the quality of their writing efficiently and ultimately become more independent writers (Zhang & Qin, 2018). Thus, self-regulated writing strategies could increase writing proficiency and writing test scores.

Finally, the path coefficient between the implicit theory of writing and IELTS writing test scores of Iranian IELTS candidates was 0.65, a positive value, confirming a significant and direct relationship (positive) between the implicit theory of writing and IELTS writing test scores of Iranian IELTS candidates. The implicit theory has two components, namely incremental theory and entity theory. Students who endorse incremental theories in writing perform better in an opinion essay (Limpo & Alves, 2017). Moreover, implicit writing theories indirectly contribute to persuasive essay quality via mastery goals and self-efficacy for self-regulation (Limpo & Alves, 2017). In addition, implicit theories could reinforce the positive impact of writing instructions. In particular, increasing beliefs in writing were associated with more significant increases in text quality during a self-regulated strategy development intervention (Limpo & Alves, 2014).

4.2. Results of the Second Research Question

The second research question aimed to propose the best model to describe the relationship between incremental intelligence, self-regulatory writing strategies, implicit theory of writing, and IELTS writing test scores. To check the model fit for Figure 1, goodness of fit indices was utilized (Table 4). To this end, χ^2/df , goodness of fit index (GFI), the comparative fit index (CFI), and root mean square error of approximation (RMSEA) were employed. To have a fit model, χ^2/df should be less than 3, GFI and CFI should be above .90, and RMSEA should be less than .08

Table 4.
Goodness-of-fit Indices

/2/ DF	RMSEA	NFI	GFI	IFI	CFI	AGFI
2.57	0.036	0.91	0.92	0.93	0.94	0.92

As can be seen, the value of RMSEA equaled 0.036, which was less than 0.08. Moreover, /2/ df was calculated as 2.57, which was between 1 and 3. Finally, GFI, and CFI indices were also greater than 0.9. Therefore, all the goodness of fit indices were within the acceptable range. Thus, the model was fit.

Table 5 shows the results obtained from the fitted model presented in Figures 1 and 2. As mentioned, paths whose t-value is greater than 1.96 or less than -1.96 are significant. In Table 5, the t-value of all paths is greater than 1.96, which is significant.

Table 5.
Results of the Fit Model

Relationships examined	Path Coefficients	t-value	Result
Incremental intelligence → IELTS writing test scores	0.68	4.65	Significant
Self-regulatory writing → IELTS writing test scores	0.51	3.17	Significant
Implicit theory of writing → IELTS writing test scores	0.59	4.21	Significant

According to the results obtained from Tables 4 and 5, it can be said that the model fitted in Figures 1 and 2 is the best model to describe the relationship between the research variables.

4.3. Results of the Third Research Question

The independent variables in the current study were incremental intelligence, self-regulatory writing, and implicit theory of writing, while the dependent variable was IELTS writing test scores. To identify which independent variable contributed most to IELTS candidates' writing test scores, the results obtained from fitting the research model in Table 5 were used.

As can be seen in Table 5, all independent variables could affect the dependent variable since their t-statistic values were greater than 1.96. However, the path coefficients of the independent variables indicated that incremental intelligence had the greatest impact on the writing score.

5. Discussion

The current study aimed to explore relationships of incremental intelligence, self-regulatory writing strategies, and implicit theory of writing with the writing performance of IELTS candidates. Its objective was to identify which study variables could contribute to enhancing writing scores and overall writing quality. The findings indicated that incremental intelligence had the greatest impact on the writing score of EFL learners. As Xu (2022) asserted, when students encounter difficult writing assignments, those with a growth mindset and a focus on learning objectives are more likely to adjust themselves to achieve the desired writing results within their capabilities. In contrast, individuals with a fixed mindset and a focus on performance objectives are prone to giving up on the task, leading to a loss of motivation to achieve their writing objectives.

Regarding the impact of incremental intelligence on self-regulation, growth mindsets are a means of facilitating self-regulation, particularly in a context that requires continuous learning efforts. The findings of the present study revealed a significant relationship between incremental intelligence (growth mindset) and self-regulatory writing strategies. Individuals with a growth mindset can change the way they perceive and invest effort, encouraging diligence and continued commitment to worthy goals. Moreover, students who believe in a growth mindset (incremental intelligence) could regulate themselves in writing better than students with a fixed mindset. Similarly, prior research has also delved into the relationship between self-regulatory writing strategies, implicit theory of writing, and incremental theory of intelligence. For instance, in studies conducted by VandeWalleh (2003) and Waller et al. (2017), two variables of mindsets and self-regulatory writing strategies were examined.

These researchers discovered a growth mindset (incremental intelligence) positively related to four types of self-regulatory writing strategies, including cognitive strategies, metacognitive strategies, social behavior, and motivational regulation strategies. Their findings suggested that students with a growth mindset tended to improve their competencies for task mastery. Mrazek et al. (2018) also found that learners' mindset can affect their self-regulated learning writing. They argue that growth mindsets offer a promising avenue for enhancing self-regulation, especially in contexts demanding ongoing learning efforts. To elaborate, individuals with growth mindsets have the potential to change their perception of challenges and their approach to expending effort, which encourages persistence and sustained commitment to meaningful objectives. In the study conducted by Bai and Wang (2020), their explicit focus was on examining the connection between growth mindsets and the utilization of self-regulated learning strategies. Their findings revealed that having a growth mindset had a positive and significant impact on various aspects of self-regulated learning strategy use, including monitoring, effort regulation, and goal setting and planning.

Other studies have explored the predictive effects of the six self-regulatory writing strategies on the writing performance of EFL secondary school students (Teng, 2020; Zhang & Qin, 2018). These findings suggested that enabling learners to engage with writing is critical to writing achievement. In particular, these results supported the contention that secondary school students' writing performance in an EFL context depends on learners developing strategies related to writing planning, goal-oriented monitoring, goal-oriented assessment, emotional control, memorization, and metacognitive judgment to understand and apply. Self-regulatory writing strategies also played a key role in guiding, stimulating, motivating, and sustaining learners' efforts, thus predicting writing performance (Teng, 2020; Sun & Wang, 2020; Zhang & Qin, 2018). The present research study concurred with these findings, indicating that self-regulatory writing strategies were positively correlated with writing performance. It underscores that students who actively employed these writing strategies as part of their self-regulation process exhibited higher levels of writing proficiency, leading to improved writing performance. This, in turn, contributed to their growth as more independent and skilled writers.

Another research project conducted by Paris et al. (1983) delved into three variables of the implicit theory of writing, metacognitive strategy knowledge, and strategy use in academic writing. This study sought to explore the relationship between implicit theories and metacognitive strategy knowledge. Their findings revealed that the more students perceived academic writing as an acquirable skill that can be learned and taught in a university setting (malleable theory), the higher the metacognitive strategy knowledge of the students. Metacognitive strategy knowledge correlated positively with the quality of strategy use (Paris et al., 1983). This finding is consistent with the findings of the present study, showing that the implicit theory of writing positively correlated with self-regulatory writing strategies. This positive correlation indicated that individuals, who adhered to implicit theory as a malleable theory, had more self-confidence and self-assessment in writing and they were more willing to learn effective strategies of self-regulation, compared to those following the fixed theory.

The study by Gunderson et al. (2017) and Limpo and Alves (2017) revealed that incremental theories were associated with higher text quality across all text genres and student gender. The finding showed that implicit writing theories were directly related to writing performance. It is crucial for teachers to recognize that the implicit beliefs students hold regarding the nature of their writing skills, whether male or female, directly impact their performance in both narrative and opinion writing tasks. As noted by Dweck and Master (2009), teachers sometimes send subtle messages unknowingly to their students in support of one theory or another. Teachers can explicitly encourage students' development of incremental theories in writing classes. As a case in point, process feedback that focuses on student efforts and strategies rather than their traits or abilities encourages incremental theories and can help students on the path to working hard. Teachers can also explicitly share with students how their personal writing difficulties pushed them to mobilize new strategies and work harder. Given that students' implicit theories tend to be stable over time (Robins & Pals, 2002), it is imperative to instill in students that writing is a malleable skill developed through extended and deliberate practice (Graham, 2018; Kellogg, 1994). Similarly, this investigation corresponds with the present study revealing the pivotal role of the implicit theory of writing in the writing performance of Iranian IELTS candidates. It indicated that students who accepted incremental theory in writing performed better as writers, and their

text qualities increased during learning. Moreover, this belief enhanced writing processing and writing instructions.

6. Conclusion

This study examined the relationship of incremental intelligence between self-regulatory writing strategies, implicit theory of writing, and writing performance among Iranian IELTS candidates. Additionally, it examined the effects of two types of mindsets, namely fixed and growth, on self-regulation and writing ability. The findings provide a deeper understanding of the advantages associated with a growth mindset (incremental intelligence) in the learning process of writing strategies. The study revealed that students who endorsed a fixed mindset tended to avoid challenges, refuse criticism, focus on the outcomes of the process, and blame themselves in challenging situations. On the contrary, students with a growth mindset perceived challenges as opportunities, drew inspiration from the success of others, concentrated on the learning process, and viewed failures as opportunities for growth. This study also revealed a significant positive relationship between the growth mindset and four types of self-regulatory writing strategies.

Declaration of Conflicting Interests: No potential competing interest is reported by the authors.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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