Examining the multi-faceted relationship between sight translation and simultaneous interpreting

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Abstract: The study investigated three aspects of the relationship between sight translation (ST) and simultaneous interpreting (SI): 1) predictive power of trainee interpreters' ST performance for their SI performance, 2) comparison between trainees' ST performance and their SI performance, and 3) trainees' opinions on ST-SI similarities and disparities. In this study, 30 trainee interpreters participated in two tests, with each test containing an ST task, an SI task and an open-ended question on ST-SI similarities and differences. During the between-test interval, trainees partook in an ST training course that served to facilitate their SI learning. Based on the analysis of trainees' SI/ST task performance and answers to the open-ended question, the study identified how the multi-faceted ST-SI relationship changed after the completion of the course. These findings could provide novel insights into the ST-SI relationship from various perspectives.

Keywords: sight translation, simultaneous interpreting, multi-faceted relationship, training course

1. Introduction

In conference interpreting, simultaneous interpreting (SI) typically involves interpreters receiving the source text via headphones while simultaneously speaking into a microphone to produce the target text (Diriker, 2015). On the other hand, sight translation (ST) refers to the rendition of a written source text into speech in the target language (Havnen, 2022). There is a growing body of literature focusing on the relationship between SI and ST from different perspectives. Efforts have been made to examine how ST performance predicts SI performance (Shang & Xie, 2023). Scholars (Agrifoglio, 2004; Chmiel et al., 2020; Lambert, 2004) pinpointed how SI processing and ST processing resemble or diverge from each other. Interpreter trainers (Song, 2010; Yan & Song, 2021; 2022) discussed how to design ST training courses that promote skill transfer from ST practice to SI performance.

However, existing studies examining multiple aspects of SI-ST relationship (i.e. the role of ST performance in predicting SI performance, similarities and differences between SI and ST processing, and ST training designs that serve to improve SI performance) have shown two limitations. Firstly, studies on SI-ST comparison and a possible predictive relationship (Hsu, 2004; Shang & Xie, 2023; Viezzi, 1989) did not give consideration to the

variability of ST training design (Bacigalupe, 1999; Yan & Song, 2021; 2022). The purpose of ST training may vary from one interpreter training programme to another, entailing various ST training designs (Li, 2014), therefore, studies where participants receive different types of ST training, research participants may not demonstrate similar statistical results. Secondly, existing research on SI-ST relationship has paid little attention to how trainee interpreters perceive similarities and differences between SI and ST processing. Trainees' perceptions in this regard may impact their skill transfer from ST practice to SI processing. As noted by Mwamwenda (2020), transfer of skill and/or knowledge may take place if learners attempt to identify the connections between their training environment and target context. To better understand the potential of ST-to-SI skill transfer, it is necessary to investigate trainee interpreters' perceptions towards SI-ST similarities and disparities.

In order to address the aforementioned gaps in the research, the present study addressed the following research questions (RQs):

RQ1: To what extent does trainee interpreters' ST performance predict their SI performance before and after an ST training course tailored to SI learning?

RQ2: To what extent does trainee interpreters' ST performance differ from their SI performance before and after an ST training course tailored to SI learning?

RQ3: How do trainee interpreters perceive the similarities and differences between ST processing and SI processing before and after an ST training course tailored to SI learning?

In response to the three RQs stated above, the following three hypotheses (Hs) are proposed:

H1: The predictive power of ST performance for SI performance would increase following the SI-oriented ST training course.

H2: The statistical difference between ST performance and SI performance would decrease following the SI-oriented ST training course.

H3: Trainee interpreters would report more ST-SI similarities following the SI-oriented ST training course.

In the sections below, a review is provided of the literature on the SI-ST relationship from three aspects: 1) predictive power of ST performance for SI performance, 2) SI-ST similarities and disparities and 3) skill transfer from ST practice to SI performance. This is followed by a description of the study undertaken and a discussion of the results.

2. ST proficiency as a potential predictor of SI proficiency

The potential role of ST proficiency in predicting SI proficiency (i.e. the research topic relevant to RQ1 has drawn rather limited attention from existing literature, despite the fact that ST has been used as an aptitude test in the admission process of translator and interpreter training programmes (Chen, 2015). As explained by Li (2014), ST is considered a satisfactory predictive device for overall translation or interpreting proficiency. However, Li (2014)

also noted that the validity of adopting ST in translation/interpreting admission tests is rather controversial and deserves further research. Additionally, Shang and Xie's (2023) regression analysis showed that for trainee interpreters recruited from a postgraduate programme (i.e. Master of Translation and Interpreting), ST scores were not predictive of SI scores in the English-to-Chinese direction. Shang and Xie (2023, p. 86) explained "the weak predictive validity of sight translation for interpreting performance could also be attributed to the fact that sight translation is more of an acquired skill than a part of interpreter readiness." In Shang and Xie's (2023) study, however, trainee interpreters' ST test was conducted one year earlier than the SI test, indicating a potential concern about data validity. Additionally, Shang and Xie (2023) did not provide detailed information regarding trainee interpreters' ST learning, for example, the timeframe of ST learning or pedagogical activities involved in such learning. Furthermore, they did not clarify if trainees' ST learning was oriented to SI, consecutive interpreting (CI) or written translation.

3. SI-ST similarities and differences

This section reviews previous studies focusing on how ST processing resembles or diverges from SI processing in order to explore the theoretical background against which RQ2 is proposed. From a cognitive perspective, a major similarity between SI and ST consists of multitasking, that is, engagement in several actions at the same time (Stachowiak, 2014). ST and SI share a few concurrent componential tasks, such as the comprehension of source language (SL) information, oral production in the target language (TL) and self-monitoring of the output (Chmiel & Mazur, 2013; Lambert, 2004). In both ST and SI, the concurrent operation of componential tasks may engender competition for limited cognitive resources and give rise to performance deterioration (Chmiel et al., 2020; Gerver, 2002). As noted by Seeber (2015, p. 82), "it is the real-time combination of structurally similar tasks (e.g. language comprehension and language production) that makes their execution more difficult, since they draw upon the same mental resources and thus interfere with each other." It is noteworthy that the time lag between the reception of SL information and production of TL output gets up to approximately 3 seconds in real-life ST and SI (Su, 2020). Nevertheless, such time lags should be cautiously controlled by sight translators and simultaneous interpreters since pauses over 3 seconds might be seen as signs of disfluency in ST/SI quality assessment (Fang & Zhang, 2021; Lee, 2015).

Another similarity between SI processing and ST processing relates to the use of interpreting strategies. The strategies of linearity (Ma & Li, 2021; Setton, 1999), summarisation (Sunnari, 1995; Yan & Song, 2021) and anticipation (Chmiel, 2021; Ma, 2021) can be employed in both ST and SI. The three rendition strategies all serve to decrease cognitive pressure in ST and SI processing. Linearity serves to divide an SL sentence into shorter units, effectuates the linear processing of SL information and creates less cognitive load compared with syntactic reformulation (Ma & Li, 2021). Summarisation helps interpreters focus on essential information rather than all pieces of a message conveyed by the source text or speaker, thereby decreasing cognitive load in linguistic comprehension and oral production (Wang, 2014). As for anticipation, it helps interpreters to "begin processing before complete information is received, and to avoid working memory being overloaded by a large amount of information" (Wang, 2015, p. 22). Additionally, there remains

a dearth of research illuminating effective ways of developing trainee interpreters' ability to implement summarisation and anticipation, which are required for both ST and SI processing.

When arranging ST practice that aimed at polishing student interpreters' summarising skills, Yan and Song (2021, p. 20) found that "due to limited cognitive resources and underdeveloped capacity of fusing propositions, the students could not execute summarisation strategy like professionals, even when the students understood the text well." Similarly, sight translators do not easily develop ability to anticipate. Yan and Song (2022) found that over the course of three-year interpreting training, trainees still demonstrated more instances of false anticipation than correct anticipation in ST processing. Given the uncertainty about the best way to teach summarisation and anticipation, it might be more practical to focus on developing trainees' ability of linearity—a strategy that is also shared by both ST and SI processing and is considered effective in easing cognitive pressure during rendition.

ST-SI comparative analyses undertaken by a number of authors (Agrifoglio, 2004; Chmiel et al., 2020; Hsu, 2009; Wang, 2024) seem to show that ST processing significantly diverges from SI processing in two respects: firstly, autonomy in processing information and secondly, SL interference. In Agrifoglio's (2004) experiment, sight translators made fewer mistakes in content accuracy than simultaneous interpreters. As explained by Agrifoglio (2004), sight translators have the benefit of the enduring availability of SL information and hence, outperform simultaneous interpreters in achieving content accuracy. This conclusion was echoed by Hsu (2009), who found that sight translators outperformed simultaneous interpreters in maintaining content accuracy across three levels of text complexity. In contrast with sight translators, simultaneous interpreters are not really autonomous in processing SL information, because they need to follow the pace of the source speech while being unable to pre-read or re-read the SL information. Nevertheless, Agrifoglio (2004) also found that, compared with simultaneous interpreters, sight translators erred more frequently in language expression since they suffered greater SL interference challenging their limited cognitive resources. Additionally, Chmiel et al. (2020) compared ST with SI in terms of SL interference levels in the processing of interlingual homographs, passive sentences and cognates. As reported by Chmiel et al. (2020), although ST resembled SI with regard to the level of SL interference demonstrated in the processing of homographs or passive constructions, ST posed significantly larger SL interference than SI in the processing of cognates.

Mikkelson (1995) described the risk of SL interference in ST processing, noting that "some interpreters find sight translation more difficult than the other modes of interpreting because they have more trouble focusing on meaning rather than words, when the message is written in black and write on a piece of paper." The greater SL interference in ST as compared to SI (see Chmiel et al., 2020) may be explained by the intrinsic difference between reading and listening in terms of information processing depth (Shreve et al., 2010). Readers tend to take heed of the surface structure of text while listeners are prone to focus on the meaning conveyed by the text (Agrifoglio, 2004; Shreve et al., 2010). According to Shreve et al. (2010, pp. 67), "if readers have a tendency to focus on words rather than meanings (relative to listeners), this fact should also contribute to creating a greater sensitivity to syntactic, lexical, or other linguistic disruptions."

Nevertheless, studies on ST-SI comparison (Agrifoglio, 2004; Chmiel et al., 2020; Wang, 2024) did not clarify how their research participants practised

ST. ST practice can be designed in various ways to serve various purposes in interpreter training (Li, 2014). Different designs of ST practice may lead to different statistical results of ST-SI comparison. It remains unclear how ST performance diverges from or resembles SI performance following ST training oriented towards SI learning.

4. ST-to-SI skill transfer

Skill transfer is the process of applying skills acquired in a previous context to a subsequent one (Suzuki et al., 2019). There are mainly two ways of skill transfer: low-road transfer and high-road transfer. As explained by Hajian (2019, p. 96), low-road transfer usually takes place when the original and subsequent contexts share multiple features, while high-road transfer arises "as a result of mindful abstraction of general principles among different events in different contexts and a deliberate search for connections among their structures." In the case of ST-to-SI skill transfer, low-road transfer may be facilitated by SI-ST similarities, while high-road transfer may be strengthened by trainee interpreters' perceptions towards how ST processing resembles SI processing (i.e. the research topic relevant to RQ3).

From the perspective of low-road transfer, the rationale behind ST-to-SI skill transfer lies in similarities between the two modes of rendition. As described in Section 3, ST resembles SI in the need for multitasking and the use of various interpreting strategies. Viaggio (1995, pp. 33–34) recognised the role of ST practice in facilitating SI learning, noting that "sight translation in general is perhaps the most effective and complete prelude to and preparation for attacking simultaneous interpretation". However, when intending ST-to-SI skill transfer, interpreter trainers need to consider the ST-SI disparities: SL interference and autonomy in information processing (see Section 3). SL interference, however, may not necessarily obstruct ST-to-SI skill transfer. As mentioned by Weber (1985) and Viaggio (1995), the greater SL interference in ST advances trainee interpreters' ability to abstract from the form of language and focus on meaning, and such ability is also desired in SI. The main issue in ST-to-SI skill transfer may refer to autonomy in information processing. To facilitate low-road transfer from ST to SI, interpreter trainers attempted to simulate some SI-specific conditions in ST training, as exemplified by their efforts to reduce ST trainees' autonomy in processing SL information with the use of dynamic sight translation (DST) (Yan & Song, 2021; 2022). DST involves source text information being presented on a screen under a specific presentation rate pre-set by ST trainers so that trainees are given less autonomy in viewing and interpreting the source text information. ST trainers who adopt DST can make the source text appear and then disappear all at once, segment by segment, or word by word (Yan & Song, 2022). As identified by Yan (2019), trainee interpreters experiencing DST practice have recognised the effective role of such practice in helping them develop various rendition skills and transfer such skills to SI scenarios.

In contrast, high-road ST-to-SI transfer has received rather insufficient attention. As Day and Goldstone (2012) postulate, learners may be unable to identify the similarities between different contexts or apply previously acquired knowledge to the new context. Despite ST-SI similarities in multitasking and the use of interpreting strategies, ST and SI diverge from each other in some aspects, such as for instance autonomy in processing SL information. It is impractical to expect that trainee interpreters would be able to effortlessly

identify the ST-SI similarities and achieve ST-to-SI skill transfer since trainees may have little experience in learning or doing ST and SI. Instruction is needed to encourage trainees to explore ST-SI similarities. Following relevant instruction explaining how ST resembles SI, trainee interpreters may change their perceptions towards ST-SI similarities, along with a greater possibility of achieving high-road transfer from ST training to SI performance. However, not much scholarly literature has compared trainee interpreters' perceptions before and after the SI-oriented ST training.

As pointed out in Sections 2, 3 and 4, there are research gaps in three areas: firstly, the predictive power of ST performance for SI performance, secondly, a comparison between ST and SI performances and lastly, trainee interpreters' perceptions of SI-ST similarities. The study reported on here was designed to address these gaps in the literature, using the methodological approach and procedures outlined in Section 5.

5. Methodology

In this study, research participants (i.e. students recruited from an interpreter training programme) underwent a nine-week English-to-Chinese (E-C) SI-oriented ST training course at the Queen's University Belfast. The study applied time limits and DST (dynamic sight translation) in arranging ST practice. Ethics approval was granted by the AEL (School of Arts, English and Languages) Ethics Committee at the Queen's University Belfast. Participants were informed that their participation in the study was entirely voluntary and that they could withdraw at any time without penalty. They were also assured that participation or non-participation would have no impact on the academic results of their postgraduate study. After completing the training course, participants took part in two tests (i.e. Tests 1 and 2). Test 1 was administered before the ST course while Test 2 was conducted after the course. Each test included an E-C ST task, and E-C SI task and one open-ended question. Before the test, participants were not allowed to access task materials in order to do pre-task preparation given that participants' individual differences in pre-task preparation might result in confounding effects in the test results. The design of the ST course and two tests is set out in Sections 5.1 and 5.2.

The study recruited 30 trainee interpreters (mean age: 23.1; *SD*: 1.21 years; range: 22-25 years) from a master's programme of E-C conference interpreting. Eight participants were male while 22 were female. All participants spoke Chinese as their first language and English as their second language. The International English Language Testing System (IELTS) score of each participant was 6.5 or above. Before taking part in this study, all participants underwent three months of ST practice tailored to SI learning in their master's programme. Over their three-month-long ST practice, participants were allowed to do prior reading of the ST practice materials before undertaking ST, with the tutor (not the author) encouraging participants to adopt linearity strategy in ST. Apart from that, the three-month-long practice neither set time limits in any ST task nor adopted DST in arranging ST tasks.

Participants' test data were rated by two judges (not including the author). The two assessors both had more than 8 years of experience in interpreter training and worked for the same interpreter training programme. They both had Chinese as their first language and English as their second language. They adopted the same analytical rating rubrics for assessing participants' task performances (see Appendix 2). Each participant received a composite score for

each task, based on the three weighted criteria: 1) content accuracy, 2) target language expression and 3) language delivery. Content accuracy and target language expression each accounted for 40% of the overall score, while language delivery constituted 20% of the overall score (Lee, 2008). The two raters scored each task independently, and the final score was derived by averaging their composite scores. These assessment standards were applied consistently across all tasks in both tests, allowing for a reliable comparison of participants' performance. Additionally, although ST and SI differ in modality, the present study adopted shared assessment rubrics for both tasks. This decision was based on the pedagogical focus of the assessment, which prioritised some common criteria (e.g. information accuracy, use of target language, and delivery quality) for evaluating interpreting quality in an educational setting.

To account for the possibility of participants undertaking additional translation/interpreting learning activities beyond this ST course, which could have impacted the test results, a questionnaire was included to ascertain whether such additional training had occurred during the between-test interval. The questionnaire showed that, during this interval, all participants had studied CI, SI and written translation in their master's programme.

5.1 Design of the ST training course
The ST course was delivered by the author, who is a certified interpreter with 6-year professional experience in the industry. The author started the course once the two assessors had finished rating participants' performance on Test 1 and sent their assessment reports to the author. In this course, participants were expected to improve their use of linearity (i.e. the rendition strategy shared by ST and SI processing) and to adjust their understanding of ST-SI similarity in the use of linearity. Each participant received nine one-hour lessons (one lesson per week) over the course of nine weeks and completed eight ST assignments as part of the course.

5.1.1 Lesson procedures
In the first lesson, the author clarified how linearity could help improve ST quality in the given examples. Next, participants were asked to use linearity to produce a better version of ST in the examples. Afterwards, in order to foster participants' ST-to-SI high-road transfer, the author decided to enhance participants' understanding of ST-SI similarity in the use of linearity. To do this, in the first lesson the author presented examples (accessed from assessment reports on Test 1 performance) demonstrating participants' unsatisfactory renditions in the SI task of Test 1 and asked participants to adopt linearity when again trying to simultaneously interpret the given examples. Subsequently, participants in each class were divided into three groups consisting of five participants each and asked to discuss how linearity might be able to impact their participants' ST renditions. Then each group provided the author with relevant feedback describing the importance of linearity in saving the effort of sentence restructuring. The lesson ended with the author recommending that participants try to apply linearity to their SI learning in the master's programme.

In each of the following weeks, participants were given an ST practice assignment. After submitting their assignments to the author, participants were given a follow-up lesson where the author provided detailed feedback, such as comments on the use of linearity skills, on participants' assignment performance as well as welcoming any questions participants might have.

5.1.2 Design and sequencing of assignments

Each assignment included two tasks: ST involving sentences and ST involving longer texts. The assignment materials all represented general topics without involving any specialised terminology. Participants were instructed to audio-record their renditions and email the completed assignments to the author.

As described in Section 4, reducing ST trainees' autonomy in information processing serves to facilitate low-road ST-to-SI skill transfer. Hence, the author had decided to introduce time pressure in the ST assignments. Unlike participants' three-month ST practice in the master's programme, participants were not given preparation time before undertaking ST of the texts. Apart from that, different levels of time pressure applied. ST assignments 1-3 required that students complete the ST on texts within specific time limits (10 minutes in assignment 1; 8 minutes in assignment 2; 6 minutes in assignment 3). Assignments 4-8 adopted DST where each text for ST was divided into segments which were then presented on PowerPoint slides, with each slide displayed within a specific timespan set by the author.

In terms of ST of sentences, the sentences represented seven syntactical structures, as shown in Table 1:

Table 1. Syntactical structures exhibited in ST on sentences

Assignments	Syntactic features demonstrated in ST on sentences
Assignment 1	Attributive clauses
Assignment 2	Appositive clauses
Assignment 3	Adverbial clauses
Assignment 4	Passive voice sentences
Assignment 5	Comparative
Assignment 6	There-be sentences
Assignment 7	Multi-clause sentences
Assignment 8	Multi-clause sentences

As for the sequencing of assignments, the author arranged the assignments from easier to more difficult since the progression of task difficulty, as described by Li (2015), helps learners gradually adapt to the increasing difficulty of learning materials. In this ST training course, the progression of task difficulty was reflected in the sequencing of assigned tasks (ST involving sentences and longer texts). ST assignments involving sentences progressed from simpler sentence structures, with each sentence containing one or two clauses, and then moved on to more complex structures involving at least three clauses in each sentence. In terms of ST involving longer texts, assignments involved an increasingly smaller timespan, and finally administered in the form of DST. Each text for ST in the assignments contained approximately 245 words, and scored about 62 using readability testing using the Flesch Reading Ease scale (REF).

5.2 Test design

Different ST/SI task materials were used for Tests 1 and 2, but the tasks were designed to be comparable in terms of readability levels (assessed using the Flesch Reading Ease scale), word frequency metrics (assessed using VocabProfile BNC) and word count, ensuring valid pre and post comparisons. All task materials were about general topics not involving specialised terminology or requiring specific professional knowledge. Additionally, the two SI tasks were similar in terms of audio length and speech tempo, with the

speeches delivered in Received Pronunciation (i.e. a standard form of British English pronunciation). The task features are outlined in Table 2.

Table 2. ST/SI task features

Task	Topic	Word count	Audio length (seconds)	Speech tempo (syllables per second)	Percentage of words in the 1000-word frequency band	Readability score
Test 1 ST task	Job hopping	246			81.3%	60
Test 2 ST task	Cycling to work	248			82.8%	60
Test 1 SI task	Living in cities	242	115	3.0	81.3%	62
Test 2 SI task	Children's rights	254	117	3.0	79.6%	62

In the case of studies comparing ST and SI performance (Agrifoglio, 2004; Lambert, 2004) or examining the predictive power of ST performance with regard to SI performance (Shang & Xie, 2023), time constraints were not applied to ST tests. In the absence of previous studies on appropriate time limits in this context, the author would not be able to set appropriate time limits in ST tests under the guidance by previous studies. Given such uncertainty, the author decided to not arrange time pressure in the ST tests.

Each of the two tests (Tests 1 and 2) was administered over two consecutive days. On the first day, participants were given the ST task; on the second day, participants were given the SI task.

For the ST task, each participant was tested individually in a soundproof room to minimise distractions and ensure standardised conditions. To minimise the possibility of task content being shared, all participants surrendered electronic devices prior to testing and waited in a designated waiting room. Participants were permitted to leave the waiting area only while being tested or after completing the ST task. Each participant's performance was audio-recorded by the researcher.

For the SI task, participants were divided into five groups, each consisting of six students. Each group was tested separately in a designated room. While the group members were present during the same session, each participant's performance was individually audio-recorded. This group arrangement was adopted to manage time and resources while still maintaining the integrity of individual assessments.

None of the participants were allowed to preview any of ST and SI task materials beforehand. They were also not informed of the task topics in advance. This ensured that the interpreting performance reflected spontaneous processing rather than prior preparation. Each task took approximately three minutes to complete.

After completing both the ST and SI tasks in each test, participants were asked to respond in writing to an open-ended question that explored their perceptions towards ST-SI similarities and differences:

> In your opinion, how does sight translation processing resemble or differ from simultaneous interpreting processing?

6. Results

The two raters' assessment data were subject to an intraclass correlation analysis. Results showed that at a 95% confidence interval, the intraclass correlation coefficients were 0.84 for Test 1 ST scores, 0.87 for Test 1 SI scores, 0.82 for Test 2 ST scores, and 0.83 for Test 2 SI scores, demonstrating high inter-rater reliability throughout the study.

Following the assessment of interpreting quality, a linear regression analysis was performed to examine the predictive power of ST scores for SI scores in each test, in order to address RQ1. Unpaired t-tests were run to investigate the extent of the difference between ST scores and SI scores in each test, in an effort to answer RQ2. Table 3 shows the results of regression analysis and unpaired t-tests.

Table 3. Results of regression analysis and unpaired t-test (*$p<0.05$)

		M	SD	R^2	p (for the regression analysis)	T	p (for the unpaired t-test)	Cohen's d (for the unpaired t-test)
Test 1	ST task scores	54.9	4.9	0.04	0.23	5.6	<0.00001*	1.5
	SI task scores	48.2	4.2					
Test 2	ST task scores	56.1	5.1	0.16	0.02*	5.2	<0.00001*	1.3
	SI task scores	49.8	4.2					

As shown in Table 3, Test 1 did not demonstrate an ST-SI correlation ($p>0.05$) or predictive relationship ($p>0.05$), but Test 2 showed a positive and moderate ST-SI correlation ($0.3<R<0.5$) as well as a weak predictive power of ST scores for SI scores ($0<R^2<0.3$). Apart from that, Table 3 shows that ST scores were significantly higher than SI scores in each test ($p<0.05$). Both tests demonstrated a large effect size for the unpaired t-test (Cohen's $d>0.8$).

A paired t-test was also operated to compare the ST-SI score difference in Test 1 with that in Test 2. As shown in Table 4, the score difference did not change significantly from Test 1 to Test 2 ($p>0.05$). Despite this, the average ST-SI score difference declined from 7.8 to 6.9 between the two tests, indicating a downward tendency for ST-SI score difference.

Table 4. Change in ST-SI score difference

	M	SD	T	p	Cohen's d
ST-SI score difference (Test 1)	7.8	4.8	-1.5	0.13	0.2
ST-SI score difference (Test 2)	6.9	4.1			

To address RQ3, a content analysis was performed to examine participants' answers to the open-ended question in each test. Three themes were generated in Test 1 while five themes were generated in Test 2. The content analysis also

calculated the number of participants demonstrating each theme and the frequency of each theme. The results are shown in Table 5.

Table 5. Results of the content analysis

	Theme	Number of participants demonstrating the theme	Frequency of theme
	1) ST-SI similarity in oral production	28	93%
Test 1	2) ST-SI difference in text availability	25	83%
	3) ST-SI difference in time pressure	17	57%
	1) ST-SI similarity in oral production	27	90%
	2) ST-SI difference in text availability	26	87%
Test 2	3) ST-SI difference in time pressure	9	30%
	4) ST-SI similarity in rendition strategies	28	93%
	5) ST-SI similarity in time pressure	18	60%

As shown in Table 5, themes 1, 2 and 3 were generated in both tests 1 and 2. Test 1 resembled Test 2 in terms of the frequency of themes 1 and 2. Theme 3 referred to participants' comments that ST processing posed less time pressure to interpreters than SI processing. Test 1 saw the frequency of theme 3 reaching 57%, which stood in marked contrast with Test 2 where 30% of participants demonstrated theme 3). In other words, fewer participants considered that ST resulted in greater time constraints than SI. In addition, themes 4 and 5 were demonstrated in Test 2, but not in Test 1. Theme 4) could be exemplified by participants' remarks that ST processing resembled SI processing in the use of rendition strategies that improved the efficiency and clarity of their output. These strategies included linearity, summarisation, paraphrasing and adjustments in parts of speech. Apart from that, Theme 5 appeared in the results of Test 2 but not in the Test 1 results. Given the presence of Theme 5 in Test 2 and the between-test reduction in the frequency of Theme 3, participants became less inclined to see ST and SI as differing in terms of time pressure. As commented by a participant in Test 2, although there was no specific time limit in the ST tasks, she was still under a certain level of time pressure and felt the need to act efficiently in ST.

7. Discussion

To answer RQ1 as well as testing H1, a linear regression analysis was conducted on trainee interpreters' ST scores and SI scores. The results showed that participants' ST scores were not predictive of their SI scores before the SI-oriented ST training. This finding echoes Shang and Xie's (2023) report of the absence of a predictive relationship between trainee interpreters' ST and SI scores. In the study reported on here, participants' ST scores were predictive of SI scores, following the ST course designed to facilitate SI learning. This is in

stark contrast with Shang and Xie's (2023) results. In view of the increased predictive power of ST scores for SI scores, the author's H1 has been substantiated. On the other hand, the author's finding of the between-test difference in the ST-SI predictive relationship is made against the background that existing research (Agrifoglio, 2004; Chmiel et al., 2020; Lambert, 2004; Shang & Xie, 2023) tends to examine the ST-SI statistical relationship at one specific time point while neglecting the dynamic nature of such a relationship. As suggested by the present study which shows changes in ST-SI predictive relationship, the statistical relationship between ST and SI should not be viewed as being static. Instead, temporal changes in the ST-SI relationship could be factored in when conducting future studies.

In addition, from the perspective of interpreter trainers, ST proficiency is potentially indicative of overall translation/interpreting capacity (Li, 2014). However, as suggested by the present findings on the ST-SI predictive relationship, ST scores were not predictive of SI scores before the between-test interval, while the predictive relationship emerged after the interval. Such a temporal change of the ST-SI predictive relationship calls for greater meticulousness in using ST tests to screen prospective trainee interpreters.

To address RQ2 and examine H2, the author conducted paired tests to identify how ST scores differed from SI scores in each test, as well as administering unpaired t-tests to examine how the extent of ST-SI difference changed from Test 1 to Test 2. Results demonstrated that ST performance was significantly better than SI performance in both tests, echoing Lambert's (2004) findings. Additionally, the present study identified the lack of between-test change in SI-ST score difference. In other words, even though trainee interpreters have received the ST training tailored to SI learning, there was no significant reduction in the SI-ST score difference, thus negating the author's H2. This finding could enrich the scholarly understanding of ST-SI comparison, given the fact that existing research (Agrifoglio, 2004; Chmiel et al., 2020; Hsu, 2009; Lambert, 2004) compared ST and SI performance without considering the factor of ST training design.

Despite the absence of significant between-test changes in ST-SI score difference, the unpaired t-tests indicated a downward trend in ST-SI difference (see Section 6. The author cannot be certain if and how the ST-SI score difference might have changed if the SI-oriented ST course had been longer. Future research could be conducted to address this question.

To answer RQ3 and in order to test H3, a content analysis was performed to investigate how participants compared ST and SI before and after their SI-oriented ST training. The findings of the content analysis showed that participants identified more ST-SI similarities following the between-test interval, thereby confirming the author's H3. If learners identify how the practice context resembles the target context, they are more likely to achieve skill transfer between the two environments (Hajian, 2019). Similar to Yan's (2019) finding, in this study participants receiving the SI-oriented ST training recognised what specific rendition strategies are shared by ST and SI processing and how such strategies facilitate ST/SI processing (see Section 6). Additionally, participants reported four rendition strategies shared by ST and SI processing (see Section 7) in Test 2. This may have reflected their attempts to identify ST-SI similarities following the nine-week interval, especially since they had not reported any specific rendition strategies in Test 1. This confirms what Hajian (2019) said about the deliberate search for general principles applicable to different contexts facilitates high-road transfer from one scenario to another. By actively exploring the rendition strategies shared by ST and SI processing,

participants demonstrated the possibility of achieving high-road ST-to-SI transfer. Apart from that, as noted by Ryan and Deci (2020), if a person recognises the value of an activity, they could have a strong willingness to undertake the activity. When trainee interpreters identify how specific rendition strategies benefit ST/SI processing, they may demonstrate better motivation to polish the use of these strategies and apply such strategies to ST/SI processing. This could help interpreter trainers fulfil their aims of eliciting specific rendition skills in trainees' interpreting performance (Yan & Song, 2021; 2022).

Nevertheless, participants' feedback suggested that they also engaged in CI, SI, and written translation learning during the between-test interval (see Section 5). Therefore, the between-test differences observed in this study may not be solely attributable to the ST training course. The concurrent learning activities could have contributed to the changes in ST-SI relationship and participants' perceptions. This constitutes a limitation of the study's one-group pre/post-test design, as it lacks a control group for comparison. As such, the causal impact of the ST intervention cannot be determined with any certainty. As advised by Dimitrov and Rumrill (2003), a two-group pre/post-test design is needed to examine how one specific factor (i.e. an intervention variable) leads to between-test variation. Further research employing a two-group pre/post-test design is needed to explore how SI-oriented ST training contributes to participants' between-test changes in the ST-SI predictive relationship, the extent of ST-SI difference, and their perceptions towards ST-SI differences and similarities.

8. Conclusion

This study aimed to investigate the ST-SI relationship from various perspectives including a predictive relationship involving ST-SI, ST-SI similarities and/or differences, and conditions of ST-to-SI skill transfer. As such, the study resulted in some interesting findings. Firstly, trainee interpreters' ST performance was predictive of their SI performance after completing the SI-oriented ST course, while the ST-SI predictive relationship had not been there before the course. Secondly, trainee interpreters' ST performance significantly differed from their SI performance before and after the SI-oriented ST course. Thirdly, trainees' ST-SI score difference before the SI-oriented ST course did not significantly diverge from that after the course. Lastly, following the SI-oriented ST course, trainees had become aware of more similarities between ST processing and SI processing.

At a time when existing research gives little consideration to temporal changes in the ST-SI relationship, this study has helped to bridge this gap by examining the ST-SI relationship before and after an SI-oriented ST course. Additionally, the study has identified trainee interpreters' views on ST-SI similarities and differences, enabling both scholars and interpreter trainers to analyse trainees' conditions of ST-to-SI skill transfer.

Even so, the research is not without its limitations. The research adopted one ST course in studying the relationship between ST and SI, while giving no consideration to the variation of ST course designs. For example, the author's nine-week ST course adopted DST in two assignments only, while DST was used throughout Yan and Song's (2021; 2022) three-year ST course. Future studies can be conducted to identify how relevant data concerning the ST-SI relationship (e.g. regression coefficient of SI scores on ST scores) vary among ST courses of different designs. Another limitation is that the research was not

able to identify any specific factor to conclusively explain the reason for participants' between-test differences. To address this issue, further studies should adopt a two-group pre/post-test design in examining trainee interpreters' between-test variations. By addressing the aforementioned limitations through more diversified ST course designs and more controlled experimental methodologies, future research can provide a more comprehensive and nuanced understanding of ST-SI relationship.

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Appendix 1. Task materials in each test

Test-1 ST task

How long have you worked in your current position? If you're having a permanent contract, how long do you intend to stay on it? It's hard to know when to resign the current job and to embark on a new career, and what is even more difficult is to decide whether to submit your resignation without a new job to go to.

In the past, a job for life was a commonplace, because loyalty with one company came with job security. But the modern society presents many opportunities to switch your career path, so having many jobs listed in your resume is a normal phenomenon. Furthermore, job hopping can be an advantage in the job market because it demonstrates our outstanding adaptability.

In the United Kingdom, a worker will change the job every five years on average. The figure is lower in the United States where people stay with a single employer for just over four years, according to official statistics. In fact, a prospective employee who changes his role every three to five years are more favoured by employers.

While it's good to pursue new work challenges, resigning your job for no job at all might be a career suicide. It's risky, but it can give you a chance to follow your dreams. If you are in a job that you are not satisfied with, then sometimes it helps to resign, reassess your priorities in life and then come up with a proper job-hunting strategy.

Test-2 ST task

For centuries, people have frequently moved into cities. These sprawling urban centers are places to work, make friends and have fun. Cities continue to grow as more and more people moving in. They hope to make the most of the opportunities in cities. But they are also worsening the congestion and pollution that already exist in cities.

According to a report by the United Nations, 54 percent of the world's population lives in urban areas. The report predicts that by 2050, this figure will have increased to around 70 percent. But as more and more people migrate from the countryside to the city to get better opportunities, they can end up with nowhere to live.

This is true in places such as Hong Kong, where migrants are difficult to rent or buy a house, and they end up building their own communities and houses on unoccupied land. These are poor communities where the houses are built out of cheap materials, and often don't have any electricity or water supply.

Of course, we do not want to live in such cities of the future. Proper urban planning is needed to make our cities the good, safe and modern places to live in. This involves improving the infrastructure and housing conditions, and creating more opportunities for education and employment.

Technology would be a decisive factor in the process of urbanization. It would collect large amounts of data about how a city is performing and may improve how a city functions.

Test-1 SI task

Most of us know that the risk of getting ill is reduced when we take good care of ourselves. Taking regular exercise has proven to be good for our health and scientists have found that the risk of getting cancer and heart disease is reduced when we take part in physical activity – and now they've found cycling to work is one of the best activities to do this. Well, good news for me then!

Pedaling to work is already popular in many cities across the world. Some forward-thinking authorities have built cycle lanes to make the commute safer, as well as providing secure places to lock them up. Some companies also provide facilities for their employees to get changed and cleaned up when they arrive at work. It all makes good sense - according to people surveyed in this study, regular cycling cuts the risk of death from any cause, as well as reducing the incidences of cancer and heart disease.

For me, cycling to work is quicker and cheaper than using public transport and it's my only form of exercise. And whereas going to the gym to lose a few pounds takes effort and commitment, cycling has just become part of the work routine. Of course, any exercise is good for you but it's thought that cycling is better than walking because the activity is longer and more intense. For me, it's the best and most enjoyable workout I can have.

Test-2 SI task

The one thing all children have in common is their rights. Every child has the right to survive and thrive, to be educated, to be free from violence and abuse, to participate and to be heard. These are innate human rights, as inalienable as those held by adults.

Millions of children around the world, some as young as five, are still working for their survival and that of their families. Yet progress has been made and should spur us all to re-commit to action to end child labor.

Today, we need to highlight the link between education and child labor. Making this link is key to developing effective strategies that can break the cycle of poverty which is a key factor in producing child labor.

The aspirations of many parents for their children and of children themselves for a decent education will remain unfulfilled dreams. Many girls and boys have no chance to attend school. Some try to combine school and

work, but all too often must drop out of school well before reaching the legal age of employment and become child laborers.

The situation today is further aggravated by the impact of conflicts and crises. In conflict zones, students and sometimes their teachers have been the victims of violent attacks and kidnapping. Reports of schools being destroyed are not uncommon. In a range of circumstances families are fleeing insecurity, crossing borders and hoping for a better life. Children make up a large share of these migration flows, at times travelling without their parents.

Appendix 2. Rating rubrics for assessing SI/ST performance

Score Range	Content Accuracy	Target Language Expression	Delivery Quality
0-30	The interpretation fails to provide a coherent or plausible narrative. In particular, accuracy is impaired by significant distortion, addition or omission to the extent that none of the main points made by the original speaker are successfully conveyed.	Use of the target language is flawed to the point that the interpretation is impossible to follow.	Delivery is so poor as to seriously impair communication, for example, due to very limited output or incomplete sentences.
31-40	The interpretation fails to provide a coherent or plausible narrative - accuracy is impaired by significant distortion, addition or omission. Some of the speaker's main points are conveyed, but not enough to reconstitute the basic argument.	Use of the target language is flawed to the point that the interpretation is difficult to follow.	Delivery is poor throughout the speech, for example, due to significant hesitation and backtracking.
41-50	The interpretation provides a mainly plausible narrative, which may not be entirely coherent. Specifically, accuracy is impaired by significant distortion, addition or omission, but the speaker's basic line of argument or narrative is conveyed.	Use of the target language is flawed by frequent instances of unidiomatic usage and contamination which challenge the listener's effort to follow what is being said.	Delivery is at times effective, but this not consistently achieved throughout delivery of the speech, for example, due to hesitation or backtracking.
51-60	The interpretation provides a mainly coherent and plausible narrative, with the main points of the speaker's argument or narrative successfully conveyed. There may be one instance of significant distortion, addition or omission or a significant number of moderate distortions, additions or omissions.	Use of the target language is mainly appropriate, with some instances of contamination or unidiomatic usage. Such instances of contamination or unidiomatic usage challenge the listener's effort to follow what is being said.	Delivery is mainly effective, but with some shortcomings e.g. hesitation, backtracking.

		Use of the target language is mainly appropriate, with some instances of contamination or unidiomatic usage, but such instances of contamination or unidiomatic usage do not challenge the listener's effort to follow what is being said.	Delivery is mainly effective, with only minor shortcomings e.g. hesitation.
61-70	The interpretation provides a coherent and plausible narrative, with most of the speaker's argument or narrative successfully conveyed, albeit with some moderate distortions, additions or omissions.		
71-80	The interpretation is plausible and coherent, the speaker's argument or narrative being conveyed with a high level of accuracy. Any slips are on points of detail.	Target language expression is appropriate and for the most part idiomatic, with few instances of contamination from the source language.	Delivery is clear, confident and professional in manner.
Over 80	The interpretation is plausible and coherent, with the speaker's argument or narrative successfully conveyed, including all points of detail and nuance. Challenging features of the original speech, such as cultural references or changes in register, are well handled.	Use of the target language is appropriate and idiomatic, without any instance of contamination from the source language.	The tone and delivery are appropriate to convey the style of the original speech. Communication with the audience is virtually flawless.