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Non-fluencies in bidirectional Chinese/English consecutive interpreting: an exploratory study of novice interpreters' performances

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Abstract

The pattern of non-fluencies, often viewed as a major indicator of an interpreter's fluency, has thus far received considerable attention from interpreting scholars. This exploratory study aims to investigate the effects of directionality on novice interpreters' control of such features in a Chinese/English consecutive interpreting task. To do so, four main types of non-fluencies including silent pauses, filled pauses, repetitions and false starts were selected for the analysis. Our results confirm plausible directional effects on the novices' production of non-fluencies, suggesting that interpreting into English produces a far greater number of total and individual non-fluencies than interpreting into Chinese. Furthermore, the study reveals a significant contrast: silent pauses exhibit longer durations in the non-native language compared to the native language. This contradicts the previous conclusions about directional effects on pausing behaviour and highlights the influence of language-pair specific differences. The study underscores the importance of silent pauses in facilitating the delivery of interpreting, shedding light on the acquisition of fluency skills during interpreter training.

Keywords

Consecutive interpreting, non-fluencies, directionality, novice, cognitive load.

Introduction

Human speech is often peppered with various forms of fluency problems such as interruptions, hesitations, repairs etc. due to processing difficulties in the course of speech planning and production (Corley/Stewart 2008). The same situation is more likely to occur in interpreting as it involves rapid bilingual switching which entails great time pressure and cognitive constraints. Due to their potential to provide valuable insights into the black box of interpreters, speech disruptions have garnered growing attention from researchers in the field of Interpreting Studies. Typically, non-fluencies in interpreting are investigated in terms of their occurrences related to various situational variables, such as directionality (e.g., Mead 2000), source speech rate (e.g., Cecot 2001), lexical density (e.g., Plevoets/Defrancq 2016). However, different types of non-fluencies are often explored in separate endeavours and a full picture of global features associated with interpreters' (re)production problems still awaits further research. Moreover, current discussions on the topic have been largely confined to simultaneous interpreting (SI) (e.g. Tissi 2000; Bendazzoli *et al*. 2011; Magnifico/Defrancq 2019; Dayter 2020), whereas the mode of consecutive interpreting (CI) has received relatively less attention (e.g. Mead 2000; Bóna/Bakti 2020).

In view of the above, the present exploratory study aims to generate some fresh findings regarding the effects of directionality on the control of non-fluencies in the delivery of novice interpreters in Chinese/English CI. In an effort to present a more interesting discussion, authentic data of two expert interpreters' performances of the same source speech materials are also included for comparison purposes. This is also because interpretations of expert and novice interpreters are usually examined in relative isolation and Liu's (2008) observation that not many studies have investigated expert-novice differences in interpretation delivery remains valid until today.

The remainder of this paper is structured as follows: Section 1 presents an overview of existing research on non-fluencies in Interpreting Studies. Section 2 describes the methodology used in this research, which is then followed by analyses in Section 3 and a subsequent discussion in Section 4 respectively. Finally, Section 5 concludes this paper with a summary of major findings and some suggestions for future research.

1. Research on non-fluencies in interpreting

The study of non-fluencies in the activity of interpreting is a relatively recent endeavour compared to their long-standing research in monolingual spontaneous speech (e.g., Goffman 1981; Hieke 1981; Duez 1982; Levelt 1983; Postma/Kolk 1992; Fox Tree 1995; Pöchhacker 1995; Tissi 2000; Cecot 2001; Petite 2005). Given its close resemblance to impromptu speech production, interpreting has been of particular interest to researchers with a focus on psycholinguistic and cognitive aspects. Features of orality such as the occurrence of various types of non-fluencies are studied as one major area of psycholinguistic and cognitive research on interpreting as they can be seen "as a 'window' on the cognitive planning activity intrinsic to speech production" (Pöchhacker 2016: 123). Constrained by stringent requirements on processing capacity that could account for a potential "production crisis" (Goffman 1981: 172), conference interpreting becomes the natural choice of context in which research on

speech non-fluencies in interpreters' performances has been continuously conducted until now.

While a usual distinction between CI and SI can be made with regard to conference interpreting, a brief glance at relevant references in the literature shows that research on non-fluencies in interpreting has largely focused on the latter. Among others, Pöchhacker (1995) compares slips and shifts in the outputs of SI between interpreters and speakers in a three-day conference and finds that although interpreters on the whole produce more such features than speakers, there are instances where certain subcategories such as false starts are high in both forms of speech production. In an experimental study involving simultaneous interpretation by students, Tissi (2000) comes up with a comprehensive scheme of non-fluencies and applies it to a descriptive analysis of the extent to which silent pauses and disfluencies in the source text are associated with similar features in the target text. She concludes that although certain links between non-fluencies in source and target texts can be confirmed, they are not as direct as assumed. In a similar experiment, Cecot (2001) compares the performances of 11 professional interpreters in different conditions (faster vs. slower source speech rates). The findings indicate that pause occurrence is less frequent when source speech rate is higher, suggesting a necessary correlation in terms of speech prosody between the source and target text production. Her study also highlights the importance of interpreters' awareness of their own delivery in SI.

In addition to case-based and experimental studies, the recent use of corpus-based methodologies has also contributed to the body of knowledge on non-fluencies in interpreting. For example, Petite's (2005) probe into the mechanism of repair in SI is among the earliest of such endeavours. Adapting Levelt's (1983) theoretical account of speech monitoring and repair to specificities in SI, she distinguishes between input- and output-generated repairs and explores their manifestation in the outputs of 8 professional interpreters recorded in authentic conference settings. Her manual search results suggest that interpreters' use of repairs is aimed at a variety of different purposes, shedding new light on the decision-making process in SI. Also, the development and application of large-scale machine-readable interpreting corpora, the European Parliament Interpreting Corpus (EPIC) in particular, has given a further boost to research on non-fluencies in SI. Bendazzoli *et al.* (2011), for example, analyze mispronounced words and truncated words occurring in both the source and target texts with a formidable mix of three languages and all directions in EPIC. Their major hypothesis that interpreters produce more such features than speakers is however only partially borne out by subsequent quantitative results. More recently, Plevoets/Defrancq (2016, 2018) adopt both parallel (comparing input and output in interpreting) and comparable (comparing interpreted and non-interpreted texts) approaches to investigate the cognitive load of interpreters. They achieve this by modelling the frequency of *uh*(m) in relation to informational measures like lexical density and formulaicity. Their findings suggest, inter alia, that interpreters experience more production difficulties when source text lexical density increases or target text formulaicity decreases, lending support to theoretical models of interpreting which highlight the competing nature of different efforts for limited attentional resources (Gile 2009; Seeber 2011).

Compared with the broad spectrum of research foci in SI, the research on non-fluencies in CI has received limited attention. Based on the PACCEL-S corpus, Dai (2011) investigates the influence of gender on the patterns of disfluencies in interpre-

tation and finds that male students tend to use more phoneme correction and deletion techniques, while their female counterparts prefer to employ more lexical and grammatical correction in their outputs. Cardoen (2013) probes into the relation between note-taking and interpreting performance of student interpreters via an empirical experiment. In her study, the composition of notes includes four parameters: full words, abbreviations, symbols and note quantity, and the target-text fluency is measured by speaking rate, disruptive silent pauses and voiced hesitations (including filled pauses, false starts, repetitions and slips of the tongue). Her results show that too many notes might hinder fluent production, and a greater incorporation of full words within the notes corresponds to a more fluent output.

It is also important to note that the variable of directionality (i.e., whether interpreters work from their first language into a second language or vice versa) may also affect the patterns of non-fluencies of interpretations. Despite the longstanding concern that interpreting into-B leads to inferior quality, such a belief, as Gile (2005: 10) points out, has built on "a mix of personal experience, ideology and tradition" rather than empirically tangible evidence. Only a very small number of studies have tackled the issue of directionality in CI. Among them, Mead (2000, 2002) conducts a fine-grained analysis of pause-related temporal variables and delves into the effects of directionality and expertise on the control of pauses in interpretations as well as the perceived reasons that trigger them. He basically extrapolates that interpreting into native language is more fluent than into acquired language. A similar conclusion is drawn in Chen (2020) where she examines the impact of directionality on professional interpreters' processes and products of CI. Specifically, she finds higher speech rate, fewer silent pauses and lower pause duration in the L2 (English) to L1 (Chinese) direction than vice versa. Also, in a recent study focusing on Chinese undergraduate and postgraduate student interpreters attending a nationwide interpreting competition, Chou *et al.* (2021) explore the directional effects on interpreting performances using four measures: speech rate, information completeness, delivery and quality of expression. They observe an advantage in students' delivery when interpreting from L2 (English) to L1 (Chinese) in the form of interpreting quality. While the present research resembles Chou *et al.*'s study (*Ibid.*) in terms of its focus on non-fluencies and language combination, the two differ in the choice of participants and the topics of source materials. On the one hand, Chou *et al.* (*Ibid.*) recruit 66 Chinese undergraduate and postgraduate student interpreters and indiscriminately label them as "student interpreters". This might be problematic as the task proficiencies of the participants may vary considerably (e.g. more or less advanced) due to their differences in the amount of interpreter training they have received. On the other hand, source materials selected by Chou *et al.* (*Ibid.*) are mixed in themes, covering the fields of economy, sports, health, diplomacy, environment, etc. Given that extralinguistic knowledge (including encyclopaedic, thematic and bicultural knowledge) is shown to be conducive to text anticipation and comprehension during the interpreting process (Gile 2009), the fluency of certain participants may be affected to some extent due to their unfamiliarity with the topics. Therefore, topics should also be controlled as a variable that may play a role in affecting the linguistic and paralinguistic patterns of interpreting in experimental conditions.

Overall, the above review, inexhaustive as it is, helps capture some general characteristics associated with the study of non-fluencies in interpreting. It can be argued

that, while current research offers some insights into various fluency interruptions and the underlying factors that might lead to their occurrences, there are aspects that remain largely overlooked and point to a need for follow-up investigation. First and foremost, despite the usefulness of non-fluencies in revealing the cognitive processes involved in an interpreting task, many of them are examined in a patchy manner: one or two specific types are addressed in a single study (e.g. Mead 2000; Petite 2005; Plevoets/Defrancq 2016; Magnifico/Defrancq 2019) and relatively fewer studies have attempted to provide a fuller picture (e.g. Tissi 2000; Bendazzoli *et al*. 2011; Dayter 2020). Secondly, there is an imbalance as far as the mode of interpreting is concerned: much more research focuses on SI whereas less is known about the situation in CI (cf. Andres 2015). Thirdly, with few exceptions (Mead 2000, 2002), researchers seem to have targeted either professional or trainee interpreters in their respective inquiries, leaving the issue of novice-expert differences almost untapped.

In the light of the above considerations, the study in this article takes a step further by incorporating into the research design contextual elements that have seldom co-occurred in studies so far, i.e., interpreting mode (CI), directionality and multiple non-fluencies (silent pauses, filled pauses, repetitions and false starts). More specifically, the following sections aim to investigate the effects of directionality on the control of non-fluencies in Chinese/English CI performed by novice interpreters.

2. Methodology

This section provides a concise overview of the definition of non-fluencies adopted in the study, as well as details about the participants, the materials, and the experimental procedures.

2.1 Definition of non-fluencies

The term non-fluencies, as the name implies, is a generic label that describes a spectrum of detectable fluency interruptions in speech. These phenomena are often seen as manifestations of the efforts of reasoning and formulation which accompany linguistic production (Goffman 1981: 172). A review of relevant literature suggests considerable variety in terms of what can be counted as a non-fluency and how they are classified. The present study chooses to focus on items widely explored by researchers in the psycholinguistic field (Goffman 1981; Hieke 1981; Duez 1982; Fox Tree 1995; Gósy 2007) as well as in Interpreting Studies (Tissi 2000; Cecot 2001; Mead 2001; Dayter 2020). Specifically, the category of non-fluencies in this study is operationalized to include a subset of four types, namely silent pauses, filled pauses, repetitions and false starts. Unlike silent pauses which could function communicatively depending on context of use (Duez 1982: 12), the other three are basically referred to as speech errors that "do not add propositional content to an utterance" (Gósy 2007: 93). Among them, filled pauses are defined as any disruptions characterized by meaningless vocalizations of any length, typically taking the form of 'ahh', 'uhm', 'err', 'urn', 'hmm', etc. (Tissi 2000: 113); repetitions take place when the speaker

utters the same word or phrase - partial or complete - in a succession (Postma/Kolk 1992: 539); false starts, however, occur when the speaker interrupts an utterance and begins anew without completing it (Tissi 2000: 114). It is noteworthy that, distinct from repetitions and false starts, pauses are often characterized as one of the temporal variables in speech (Mead 2005), hence the need to further specify their durations for investigative purposes. In this study, we adopted the widely acknowledged minimum threshold of 0.25 seconds, as established in prior relevant works (Goldman-Eisler 1968; Duez 1982; Tissi 2000; Mead 2002), for the purpose of detecting and analysing silent pauses within our dataset.

2.2 Participants

Fifteen college final-year undergraduates (designated N1-N15) with above-average level of English proficiency were recruited to participate in the study. Among them, four are male (marked with asterisks in Tables 2 and 3) and the others are female. All participants were English majors and their English proficiency was tested based on their scores in Test for English Majors Band 4 (TEM-4), which is administered by the National Advisory Commission on Foreign Language Teaching in Higher Education in China and enjoys nationwide recognition as a major benchmark of English proficiency (Jin/Fan 2011). To minimize the impact of English knowledge on data, only those with a score above 'good' (≥70 out of 100 points) took part in the study. They had learned English as a foreign language for more than ten years and received a full year of CI training in which they attended four interpreting courses totalling 128 hours of classroom instruction in basic skills such as note-taking and logical analysis. Thus, the participants were generally unbalanced Chinese-English bilinguals with limited experience of interpreting and could be classified as novice interpreters. They were asked to interpret two speech segments, i.e., one in Chinese and the other in English selected from the same event. Prior to the formal experiment, the participants were required to sign informed consents after being told about the research purposes and the anonymity of their information and responses. Furthermore, to facilitate comparison, we also gathered the respective interpretations of two professional interpreters (referred to as E1 and E2) who were actively providing interpretation during the recorded sessions. Both professional interpreters worked into their non-native languages and had regularly been seen on TV to interpret for important meetings, talks and negotiations between the Chinese and US governments and thus were fully qualified as experts. The research was conducted in line with ethical principles after obtaining the required permission from the university where the corresponding author works.

2.3 Materials

For the purpose of maximum comparability between task materials for both interpreting directions, source speech texts from the same event were targeted. Specifically, we selected excerpts from the speeches given by the former Chinese president Hu Jintao and the US president Barack Obama during the 2011 Joint Press Conference. The

two leaders took questions from the journalists and answered in their mother tongues. Their speeches were rendered consecutively into the other language by their respective interpreters on the scene. While interpreting for such a high-stakes setting might be perceived as highly challenging for novices, the fact that both leaders addressed the media impromptu means that it could be less so. In addition, to further adjust and balance difficulty levels between Chinese and English originals, the following steps were taken successively to decide on materials for this study: (1) extracting speech segments which are similar in length and which respond to the same question to ensure a shared general topic; (2) inviting three instructors of interpreting courses in the same faculty to evaluate the general difficulty level of extracted materials on a 5-point scale from 1 (very easy) to 5 (very difficult) in terms of speed, topic and intelligibility, and notably, no major differences emerged among the raters; (3) assessing the difficulty of selected materials via quantifiable measures (see Liu 2008) such as lexical density (ratio of content words to total, including nouns, verbs, adjectives, adverbs, numbers, and pronouns) and structural complexity (words per utterance). Overall, as summarized in Table 1, material difficulty between the selected Chinese and English source speech segments proves to be broadly comparable (all numbers are rounded to one decimal place except speech duration).

Language	Duration	Speech rate (syllables per minute)	Lexical density (%)	Structural complexity	Instructors' average score
Chinese	2'13''	177	67.9	10.4	2.3
English	2'10''	170	63.5	11.5	2.6

Table 1. Information on selected source speech materials

2.4 Procedure

To create an optimal experimental environment that closely replicates the original event for the students, the following steps were taken. First, the interpreting task was arranged to take place in a quiet language lab with digital broadcasting and recording facilities where each student, one at a time, performed the interpreting task. Second, we ensured that the students were briefed on the experimental procedures. This orientation began with an introduction to the topic and context concerning the task, featuring slides from the original event and the broadcasted questions posed by journalists. Third, during the experiment, the students received signals to start interpreting on a segment-by-segment basis and their performances were recorded for further evaluation and analysis. Each segment was meticulously controlled to match the same length as those interpreted by the two professional interpreters during the original scenario. Finally, the recordings containing the interpretations of all participants (including those of two experts) were manually transcribed by the first author in an orthographic manner along with the non-fluencies in question. Subsequently, the transcriptions were reviewed and verified by the other author.

In terms of transcription, we applied the software Adobe Audition 1.5 to better capture various non-fluencies and have them properly represented in the transcripts.

As an initial step, each recording was converted into an oscillogram on which duration of pauses can be conveniently cued and measured, using functions provided by the software. In light of our definition, only silent pauses above the minimum threshold of 0.25s were considered. For the pauses which are mixed in nature, i.e., silent and filled pauses occur in succession, we followed Mead's (2002) advice and treated them as filled ones only. With regard to repetitions and false starts, the software also allowed handy control of playing back and forward any chosen segment in view, making the beginnings and endings easily detectable. For the purpose of differentiation, the four types of non-fluencies were marked as SP, FP, RPT, and FST on the oscillogram, standing for silent pauses, filled pauses, repetitions, and false starts respectively. For silent and filled pauses, their durations were further specified for calculation purposes. Consequently, all non-fluencies in a specific recording were marked on the oscillogram they were associated with. They were then annotated one-by-one in the transcript of that recording, with each of them corresponding to their occurrences in the oscillogram in terms of location and length (in the case of pauses). Marking for each type of non-fluencies in the transcripts was indicated in square brackets (see the example in Section 4.4).

Finally, quantitative analysis was conducted to calculate, on the one hand, total duration of pausing in each recording; on the other, total frequency of each non-fluency type in every recording. Average pause duration per minute and average occurrence of all non-fluencies per minute (rounded to the nearest integer) in the novice interpretations in both directions were further calculated and compared using paired t-test.

3. Results

Tables 2 and 3 present rounded average occurrences of non-fluencies and average pause durations per minute in the novice interpreters' output respectively. Data for the experts are also juxtaposed for comparative purposes.

	Non-fluencies in Chinese					Non-fluencies in English				
	SP	FP	RPT	FST	Total	SP	FP	RPT	FST	Total
N1	10	14	7	6	38	18	8	6	7	39
N2	21	8	2	4	36	24	5	3	3	35
N3	12	9	1	7	28	17	11	5	5	37
N4	11	10	1	7	29	17	6	5	4	32
N5	9	12	3	7	31	10	12	3	7	32
N6	9	19	3	3	35	19	7	4	4	34
N7*	15	3	6	6	29	16	3	7	6	33
N8*	11	15	3	5	33	13	14	7	3	37
N9	13	15	2	3	32	19	10	1	3	33
N10	7	12	3	10	31	9	11	2	4	26
N11*	7	6	0	1	15	15	6	1	2	23

N12	9	14	8	7	39	11	15	10	3	40
N13	11	8	2	5	25	21	6	9	3	39
N14*	22	2	1	2	27	22	5	1	2	29
N15	6	11	2	5	24	7	16	3	4	30
Mean	11	11	3	5	30	16	9	4	4	33
E 1	18	3	1	1	23	/	/	/	/	/
E 2	/	/	/	/	/	26	0	0	0	26

Table 2. Average frequency of non-fluencies per minute in the output of both novice and expert interpreters

	Pause duration in Chinese			Pause duration in English		
	SP	FP	Total	SP	FP	Total
N1	4.708	9.541	14.249	12.768	6.914	19.682
N2	15.833	11.405	27.238	21.278	9.908	31.186
N3	6.785	9.189	15.974	12.309	11.898	24.207
N4	6.038	5.649	11.687	8.582	7.263	15.845
N5	3.398	8.893	12.291	5.142	14.447	19.589
N6	4.638	18.540	23.178	10.695	9.410	20.105
N7*	14.721	4.367	19.088	8.822	3.316	12.138
N8*	5.214	17.141	22.355	10.803	21.848	32.651
N9	6.951	18.575	25.526	8.405	14.653	23.058
N10	5.581	14.585	20.166	3.662	9.759	13.421
N11*	3.161	4.553	7.714	7.756	10.119	17.875
N12	4.556	9.111	13.667	4.941	14.872	19.813
N13	7.992	14.358	22.350	16.278	8.839	25.117
N14*	10.397	1.069	11.466	11.196	7.429	18.625
N15	3.525	7.999	11.524	3.368	11.780	15.148
Mean	6.900	10.332	17.232	9.734	10.830	20.564
E1	7.116	1.259	8.375	/	/	/
E2	/	/	/	14.332	0	14.332

Table 3. Average pause duration in the output of the novice and expert interpreters (seconds per minute)

To compare the general patterns of non-fluencies in the novices' output in two directions, total occurrence and percentage for all four non-fluency types are further calculated and presented accordingly in Figure 1.

First, as Figure 1 shows, directionality on the whole does exert a strong impact on the occurrence of each non-fluency type under investigation. Specifically, interpreting into Chinese generates a higher percentage of filled pauses and false starts but a lower proportion of silent pauses and repetitions than interpreting into English. Moreover, the total amount of non-fluencies in the English interpretations is substantially higher than that in Chinese (1453 vs. 820), and the same is true of the number of individual non-fluencies. This clearly reflects that maintaining fluency in the former has been much more challenging than in the latter, considering similar lengths of the source speech materials. Interestingly, though, the chances that the novices pause in their production, silently and audibly together, seem generally insensitive to the influence of directionality (73.5% in Chinese and 74.7% in English). The same can also be claimed for the combination of repetitions and false starts combined. This suggests that there could be a bidirectional shift between the occurrences of silent pauses and filled pauses as well as between repetitions and false starts as a result of change in interpreting direction.

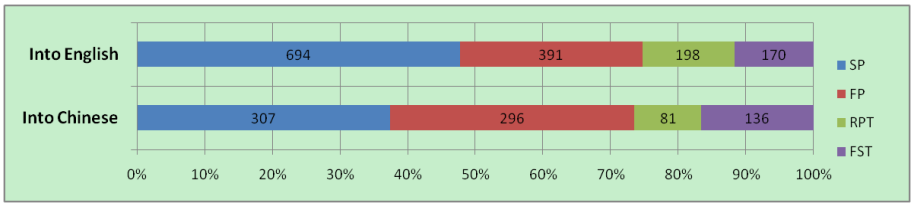

Figure 1. Total occurrence and percentage of non-fluencies in novice interpreters' output in two directions.

Secondly, in terms of average frequency per minute, statistical analysis based on results in Table 2 shows that silent pauses are significantly more frequent in English than in Chinese interpretations (t=4.854, p= .000). At the significance level of p = 0.05, similar effects of directionality can be found on repetitions (t=2.588, p= .021) and total non-fluencies (t=2.597, p= .021). However, there is no significant difference between the frequencies of filled pauses in English and Chinese (t=-1.435, p= .173). As for false starts, by contrast, they are found to be significantly more frequent in Chinese than in English (t= -2.316, p= .036). In addition, there is a significant positive correlation between average frequencies of silent pauses in English and Chinese (Pearson correlation coefficient = 0.747, p = .001). A similarly significant correlation is also found between average frequencies of repetitions in both directions (Pearson correlation coefficient = 0.628, p = .012), suggesting a habitual use of disfluent features among the novices irrespective of interpreting directions. Further, there is a negative correlation between average frequencies of silent pauses and filled pauses in English (Pearson correlation coefficient = -0.758, p = .001).

Thirdly, statistical tests involving the additional parameter of average pause durations in both directions (see Table 3) reveal significantly longer silent and total pause durations in English than in Chinese (t= 2.812, p= .014 and t= 2.289, p= .038 respec-

tively). However, durations for filled pauses do not vary significantly between the two interpreting directions (t= 0.391, *p*= .701). These results apparently find their echoes in the foregoing analysis of average non-fluency frequencies.

Last but not least, as can be seen in Table 2, pausing takes up a predominant proportion of the totality of non-fluencies produced by the novices in both languages. While regular use of silent pauses is indispensable to any speech production due to the common need of stopping to breathe, there seems a divergence, albeit tentative given the imbalance of our samples, in terms of the pausing pattern between the novices and the experts: on average, the novices pause almost as much as the experts per minute (novice group mean versus expert is 22 : 21 in Chinese and 25 : 26 in English), but they on the whole tend to fill silences with vocalized pauses more frequently than the experts do. Such a tendency is also consistent with the results in Table 3. That is, on average, the novices pause longer than the experts per minute, yet they generally spend less time in silence than the experts do. The difference seems more prominent when all the interpreters (including E2) were doing a retour, i.e., interpreting into the non-native language of English (see Table 3).

In addition, although there appears a stylistic difference in pausing strategies between the two experts (E2 paused more frequently and longer than E1), they seem to display good consistency in controlling repair-related features of non-fluencies such as repetitions and false starts. In contrast, the two types are found to be excessively evident in the novices' interpretations, an unsurprising indication that their maintenance of fluency is more problematic and less effective than that of the experts.

4. Discussion

The purpose of the present study was to examine the effects of directionality on the novices' control of non-fluencies in CI. While the results obtained from our small-sized samples can only provide a limited basis for discussion, they do reveal some general trends that help shed light on the novice interpreters' struggle with production challenges in different interpreting directions.

Apparently, directionality proves to be a significant factor responsible for the changing pattern of occurrence of various interruptions in the novices' interpretations. To summarize, the effects of directionality on the production of non-fluencies in the present study are three-fold, namely the relative proportion of individual non-fluency types, the average frequency of non-fluencies per minute and the average pause durations per minute.

4.1 Relative proportion of individual non-fluency types

Essentially, the fact that the English interpretations contain a far greater number of non-fluencies than the interpretations in Chinese arguably lends support to Mead's (2000) hypothesis that production is more fluent when interpreters work into their native language than into a non-native one. More importantly, as findings in Mead's study are based on the analysis of pauses only, results from the present study never-

theless substantiate his claim from a more comprehensive perspective. Also, changes in the proportion of individual non-fluency types are observable between the two directions of interpreting. In particular, as Table 3 indicates, whereas interpreting into non-native English seems to result in a higher level of silent pauses, interpreting into native Chinese is likely to generate more percentages of filled pauses and false starts.

In addition, the percentage rise of filled pauses and false starts in Chinese as opposed to English interpretations provides some insights into the novices' management of cognitive resources. From the point of view of Gile's (2009) Effort Model for CI, reformulation in the target language involves well-balanced allocation of limited processing capacity between four efforts, namely note-reading, remembering, production and coordination. These four efforts are presumed to cooperate with each other whilst competing for necessary attentional resources in order to carry fluent message delivery into the target language. Such operations are not always smooth, as interpreters, particularly novices, are expected to encounter various problem triggers that might have an effect on the above efforts (Gile, 2009). This means processing capacity available for each effort or for overall efforts may no longer suffice and may consequently lead to breakdowns in performance which are typically manifested in the form of non-fluencies such as filled pauses and false starts.

As far as the direction of interpreting in the present study is concerned, production in native Chinese obviously means presumably much lower pressure on syntactic structuring and lexical access for novices compared with that in their less proficient English. However, while the increased proportion of false starts in Chinese might be attributed to more cognitive resources available for self-monitoring and self-correction of target output whenever necessary, the reasons for the greater proportion of filled pauses in Chinese than in English seem unclear. As filled pauses signal more explicitly planning difficulties (Fox Tree 2002), one tentative explanation might be less effective message retention of non-native English speech segments in the first phase of CI (Gile 2009: 175-176) where good interaction between listening and analyzing, note-taking and memory skills could become more challenging for novices. This in turn may offset at times the benefits of production in native Chinese in phase two and make them vocalize their hesitations.

4.2 Average frequency of non-fluencies per minute

Results concerning the average frequency per minute for individual and total number of non-fluencies in the Chinese and English interpretations allow for a comparison of the directional effects on the incidence of such features. Presumably, the tendency to resort to more frequent false starts yet less frequent repetitions in Chinese and vice versa in English, is inherently associated with different proficiencies that the novices have for the two languages. As in spontaneous speech, repetitions in interpreting function no differently from filled pauses as they delay the production of new lexical and syntactic elements and are thus labelled by Dörnyei (1995: 57-58 as "lexicalized pause fillers". False starts, however, are often followed by repair operations which involve more active control of the speaker's self-monitoring (Levelt 1983, 1989). Obviously, the advantage of interpreting into native Chinese offered more leeway for

the novices to do so. That said, frequent false starts and repetitions in both directions are symptomatic of their serious management problems of cognitive resources during the interpreting process which led to a number of unwanted speech errors.

Also, a significant difference is found between average occurrences of silent pauses in the two languages, with the English interpretations containing more frequent silences. This could arguably be attributable to the gap of language constituent availability between Chinese and English, i.e., production availability is higher in native language than in acquired language (Gile 2009: 237). In reality, while the issue of linguistic knowledge availability could haunt unbalanced bilinguals of varying proficiencies, its negative effects on fluency can be minimized by maneuvering silent pauses more strategically, as evidenced in the following discussion of the experts' performances in Section 4.3. Further, a significant strong negative correlation between the average frequencies of silent pauses and filled pauses in English implies an inverse association between the two. In other words, the novices tend to use one more frequently when they use the other less frequently. Interestingly, Mead (2000) also reports on a similarly strong correlation between average times of silent pauses and filled pauses in English (Pearson correlation coefficient = -0.633, $p = 0.05$), yet no significant difference is detected on such a dimension in the present study (Pearson correlation coefficient =-0.187, $p = .505$). Subsequent replication studies involving different language pairs and larger samples are absolutely necessary to gain a more in-depth look at the interplay of pauses and beyond.

4.3 Average pause durations per minute

It is no surprise to identify consistency between average pause durations and average pause frequencies in terms of their association with directionality, i.e., the more frequently the novices paused on average, the longer their pause durations would be. And yet, statistical results in the present study seem to contradict the relevant findings in Mead (2000). Specifically, while a significant effect of directionality is identified on total pause frequency, in the present study it is silent pauses in lieu of filled pauses that are found to be significantly longer in non-native language than in native language, i.e., English and Chinese respectively. Causes at the root of such a discrepancy could be many, yet language-pair specific differences might be a major contributing factor. This is particularly salient in the sense that average frequencies of filled pauses in English in both studies show a small difference (12.63 in Mead (2000) and 10.83 in the present study), whereas those in Chinese and Italian are noticeably wider in gap (7.17 in Mead (2000) and 10.332 in the present study). Also, according to Gile (2009: 197), similarity or lack thereof between languages in lexical, syntactic and informational terms is a strong determinant of word retrieval and sentence planning efficiency. It can thus be inferred that working in a cognate language pair with shared historical roots (e.g., Italian and English) poses less processing constraints than switching between a non-cognate one (e.g., Chinese and English). Again, this partially explains the phenomenon that average frequencies of individual types of pause and of total pauses in the present study are generally higher than those in Mead (2000) in both directions, with filled pause frequencies in English being the only exception.

4.4 Novice-expert differences in the production of non-fluencies

In addition to the impacts of directionality on the production of non-fluencies, juxtaposing the experts' behaviours with those of the novices provides an interesting point of reference in examining the role of expertise in fluency strategies. Unlike SI, in which overlap between listening and speaking can lead to increased risk of production crisis, speech production in CI is self-paced and does not impose high pressure on the interpreter (Gile 2009: 184). Nevertheless, our preliminary findings show in a way that the novices are more susceptible to casual breakdowns of speech flow than the experts. In comparison, the experts showed much greater reliance on silent pauses while resorting to few audible features that could hamper their delivery fluency; the novices, though on the whole paused as frequently, often fell into the pits of vocalized hesitations or corrections, rendering their interpretations less fluent. This demonstrates that the novices are yet to become more skilful in controlling their output in such a way, as Goffman (1981: 172) suggests, that hides efforts of reasoning and formulation backstage. Tactics as such include, among others, the use of silent pauses in coincidence with boundaries of meaningful units (Deese 1980; Setton 1999: 50). This approach can be particularly contributory to fluency enhancement in interpreting, as exemplified in pausing strategies adopted by the expert (E2) in contrast to the novice (N14) when interpreting the same segment as follows.

ST:正像刚才这位记者先生所讲的，当今世界，人类面临着许多全球性的挑战。我还要强调的是，任何一个国家都难以在这些挑战面前独善其身，也都无法独自地来加以应对。(Gloss: Just as the journalist said, in the world today people face many global challenges. I also want to stress that no country is free from these challenges and is able to cope with them relying on their own power.)

E2: As the journalist who raised that question said [SP 0.616], that in today's world mankind faces [SP 0.412] more and more global challenges. [SP 0.632] And I would like to stress here [SP 0.740] that [SP 0.394] no country [SP 0.694] can remain unscathed in face [SP 0.328] of so many global challenges. [SP 0.636] And no country [SP 0.453] can single-handedly [SP 0.550] tackle global challenges.

N14: As the [SP 0.324] journalist [SP 0.271] mentioned just now [SP 0.408] today the world [SP 0.623] and the people [SP 0.405] are facing [SP 0.301] different kind of international issues. [SP 0.835] and now I would like to emphasize that [SP 0.550] any country [SP 0.297] is [SP 0.777] [FST] will find it very difficult to solve problems by themselves. And it is impossible for them [SP 0.726] to solve them in an [SP 0.314] appropriate way [SP 0.290] by themselves [SP 0.398] as well.

The above example suggests that an appropriate number of silent pauses is essential to maintaining speech fluency in interpreting. As the task of interpreting poses similar, if not the same, requirements of cognitive processing on the novices and the experts respectively, the need for them to stop speaking for reasons such as breathing and lexical retrieval is realistically inevitable. The difference is, the experts have acquired and honed their skill of "smart pausing" in their day in and day out real-life interpreting practice, but the novices were short on awareness of the functional use of silent pauses in the planning and production of target speech. Of course, the less effective control of pauses by the novices is necessarily associated with their lan-

guage competences (particularly foreign language given their status as unbalanced bilinguals) and skill proficiency such as the efficient use of note-taking and memory. However, while the development of such linguistic and extralinguistic knowledge involves long-term exercises and drills, heightened attention to the role of silent pauses in improving target language fluency is believed to be helpful to the progression of essential interpreting skill sets on a personal level.

5. Conclusions

The present research attempted to explore the role of directionality in novices' handling of non-fluencies in Chinese/English CI. Our findings confirm plausible effects of directionality on the novices' production of non-fluencies and provide support to Mead's (2000) hypothesis that interpreting into native language tends to be more fluent than into non-native language. Nevertheless, results concerning pause behaviour in this study also show some inconsistencies with Mead (2000), inter alia, silent pauses rather than filled pauses are identified to be significantly longer in non-native language than in native language. It is believed that possible language-pair specific differences in comprehension and production may have played a part in forming such distinct patterns.

Also, the inclusion of the expert data provides a few insights, though fairly limited, into the ways production difficulties are managed as a result of different levels of expertise. The experts' efforts in carefully keeping production difficulties backstage are assumed to have contributed to the rare occurrence of audible disfluent features such as repetitions and false starts in their output. Indeed, tactical use of silent pauses and effective suppression of salient speech faults are perhaps what distinguishes experts from novices in terms of fluency strategies. While many factors could be operative in achieving fluency, increased awareness about the significance of silent pauses to smooth delivery is apparently essential to the development of interpreting expertise. Therefore, it is recommended that trainees receive guidance on this aspect throughout their CI training, particularly during the initial phases.

In conclusion, findings in the present study are largely preliminary and further research involving more balanced and larger sample sizes, as well as different language pairs, is necessary for validating or modifying the current conclusions. Also, conducting retrospective interviews, in order to gain greater insight into the probable reasons or motivations behind the occurrence of various non-fluencies, is expected to help detect specific problem triggers on an individual basis and devise pertinent solutions to improve quality of interpreting.

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