An Application of Comparative Corpora of Interactional Data – toward the Sound Profiles of Sites of Initiation in French and Mandarin Recycling Repair

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Abstract

This study examines the sound profiles of sites of initiation in French and Mandarin recycling repair (also disfluent repetitions). 150 examples of disfluent repetitions were extracted from comparative speech corpora of naturally occurred, face-to-face Mandarin and French interaction. By the approach of *interactional prosody* plus *impressionistic judgments*, each instance of recycling repair was annotated manually for its prosodic realization, including relative pitch height and duration between the R1/R2 of the repair, as well as silence and other sound cues for initiating the repair. Through comparing the results of acoustic measurements, it is suggested that interlocutors of the two languages may orient to different methods of initiating the repair in spontaneous interaction in that, French speakers tend to incorporate lengthening at the end of R1 plus optional filled pauses to initiate the repair, while Mandarin speakers employ quick cut-offs for repair initiation, followed by immediate repair.

1 Introduction

Repair is a commonly occurring phenomenon in face-to-face interaction. During the process of conversational exchanges, speakers often stop before the end of their turns to make adjustments, i.e. to correct, to elaborate, or to qualify what they have said (Jasperson, 1998). As have shown in previous studies by Schegloff (1979) and Schegloff et al. (1977) on repair in natural conversation by the approach of conversation analysis (CA), the type of *same-turn*, *self-initiated* repair occurs far more frequently than other-initiated repair. In terms of the sound environment for initiating the repair by CA approach, Schegloff (1979) suggested that the

sites of initiation in English self repair may involve a limited number of forms that are sensitive to the most immediate sound environment during production, including *cut-off*, *pause*, or *filler*. It should be noted that Schegloff further pointed out that the location of the site of initiation in English repair could be "after the first sound of a word or just before its last" (1979: 275). To extend Schegloff's observation on the site of initiation in self-repair further, Fox et al. (2009) reported a cross-linguistic investigation of sites of initiation in same-turn self-repair from seven languages (including Mandarin) with the goal to uncover the universal principles in shaping sites of initiation in recycling and replacement repairs across languages.

The current study provides detailed acoustic profiles for the sites of initiating self-repair, extracted from comparative speech corpora of naturally occurred, face-to-face Mandarin and French interaction. Specifically, this study examines the sound profiles of the particular example of *recycling* repair (or disfluent repetitions, shortened as DR) which is defined as "a brief, sometimes a longer repeat or re-saying of part of the utterance occurring in a conversational turn", following Schegloff (1987: 71). Below are two examples of recycling repair in French and Mandarin respectively:

(1) **le [R1] le [R2]** terrain commençait à glisser
beaucoup (Henry and Pallaud, 2003)
the the field begin to slip a lot
"**the the** field began to slip much"

(2) 他那時候買– **[R1]** 買 **[R2]**這個送 ipod
tā nà shíhou **mǎi- mǎi** zhège sòng ipod
3sg DET time **buy buy** DET offer PN
"(At) that time, it was **buying- buying** this one and getting one IPod for free."

150 instances of recycling repair/DR in Mandarin and French were culled from comparative speech corpora of both languages (cf. Bertrand et al., 2008; Chen et al., 2012). By

the approach of *interactional prosody* plus *impressionistic* judgments (cf. Benkenstein and Simpson, 2003; Kelly and Local, 1989), each instance of recycling repair was annotated manually in terms of its prosodic realization for and around the site of initiation, including pitch, duration, silence around R1 and R2 while accomplishing the repair, as well as perceivable sound cues including cut-offs and/or sound stretch to initiate the DR. As an application to the previously established comparable corpora of Mandarin and French interactional data, the major goal of the current study is to provide detailed sound profiles for sites of initiation in recycling repair of both languages. Although Fox et al. (2009) has provided the cross-linguistic analysis on the sites of initiation in same-turn self-repair, their study wasn't able to cover much analysis on the sound realizations in repair initiations, due to some constraints on the data collected. As will be shown, the result of the present study suggests that speakers of the two languages seem to favor different methods of initiating recycling repairs in terms of the sound realization. Based on the comparative results of acoustic measurements, it will be demonstrated that Mandarin speakers tend to initiate the repair by cut-offs at the end of R1, followed immediately by the repair; while French speakers incorporate the sound cue of lengthening at the end of R1 with optional filled pauses to initiate the repair. With instances of DR annotated by their prosodic realizations in both languages, eventually the data from the current study may serve as yet another language resource for further exploration of cross-linguistic studies on how human interaction is reflected in sound and prosody, i.e. specifically how the initiation of repair in terms of prosodic realization could be associated with interlocutors' strategies for turn-taking and sequential organization of the interaction across languages.

The paper is organized as follows. Section 2 provides a brief review of related research on repair/disfluency. In section 3 it introduces the data incorporated in the current study and the methodology adopted for analyzing the sound production within and around the sites of initiation of recycling repair instances. Section 4 presents the results from acoustic measurements. Section 5 discusses the implications of the results based on the acoustic analysis. Finally, section 6 is the summary and future research.

2   Related Research

In the following 2.1, it introduces previous research that focused on repair and/or disfluency. Section 2.2 and 2.3 provide review of the studies discussing the phenomenon of disfluency in Mandarin interaction and French conversations respectively.

2.1   Research on Repair/Disfluency

The discussion of same-turn self-repair has been the centre of focus in studies of the relevant fields, including psycholinguistics (e.g. Levelt, 1983; Levelt and Cutler, 1983), computational linguistics (e.g. on disfluency in speech: Shriberg, 1994; 1995; Tseng, 2003), general linguistics (e.g. Fox et al., 1996; Fox et al., 2009), and also in conversation analysis (e.g. Jasperson, 1998; Schegloff, 1987; Schegloff et al., 1977).

Most of the earlier studies on repair/disfluency focused on the phenomenon mainly in English. It was not until Fox et al. (1996) that there had been discussion about repair in other languages such as Japanese. Some previous studies that focused on DR in other languages include: Benkenstein and Simpson's study on the phonetic correlates of self-repair involving word repetitions in German speech (2003); Henry and Pallaud discussed word segments and repeats in French speech (2003); and Tseng discussed repetitions in spontaneous Mandarin (2003; 2006).

2.2   Repetition Repair in Mandarin Conversation

As mentioned, the current study concentrates on the specific instances of *recycling* repair as one of the method of repair in conversations. There are several reasons that this particular method of carrying out same-turn self-repair has been chosen as the main focus: first of all, as shown in some previous quantitative studies on Mandarin repair (cf. Tseng, 2003; 2006), this type of repetition repair is the most frequent type of repair in Mandarin conversation. Moreover, Fox et al. (2009) also suggested that Mandarin speakers consistently initiate repair after the word is recognizably completed, i.e. the initiation in or after the last sound of the word in repair while recycling. Most of all, with regard to research methodology; the preference of initiating Mandarin repair after recognizable completion provides a sound justification to compare the sound realization of repeated words or phrases while doing the repair: since the

recycling would be a complete repetition of the same word or phrase, it actually allows for a straightforward comparison of the prosodic realizations between R1 and R2 of the DR.

Another study focusing on Mandarin recycling repairs was Chen (2011), which took the approaches of conversational phonetics and interactional prosody toward the analysis of sound patterns of Mandarin recycling repairs in natural conversation. The purpose of the study is to examine how the combination of detailed prosodic features (including pitch, silence, duration, and loudness) forms various sound patterns in reflecting important aspects of talk-in-interaction and the sequential organization of Mandarin conversation through recyclings. In the preliminary findings, 6 sound patterns were identified and each pattern corresponds to a specific interactional function while interlocutors recycle during conversation exchanges (Chen, 2011). The result from the research highlights the *interaction-specific*, *sequence-specific*, and *function-specific* examples of Mandarin recyclings in correlation with the use of particular prosodic patterns (Chen, 2011).

2.3 Repetition Repair in French Conversation

As for the studies on repair/disfluency in French, Henry (2002) reported a quantitative study of repetitions based on a corpus of one million-word spontaneous spoken French. Since the purpose of the study was to contribute to the improvement of speech recognition, the article focused mostly on the grammatical categories involved in the French repetitions and the syntactic locations of the repetitions (Henry, 2002). Part of the result did suggest that, other than direct repetition (i.e. when R1 is followed directly by R2), the *associated repetition* is another frequent type of repetitions in spoken French. Of the type of associated repetition, it was found that the repeated combination of [R1+word+R2] occurred more frequently (Henry, 2002).

Another study focusing on the prosodic parameters of disfluencies in French conversation was by Bartkova (2005). Based on the method of statistical analysis, Bartkova (2005) examined the prosodic features of French disfluencies derived from speech data consisted of telephone messages. The result from the study suggested that, of the prosodic parameters of word repetitions, 65% of the word repetitions

with filled pauses could have them located between words of repetitions (Bartkova, 2005). It was further observed that, when filled pauses were not separated by silent pauses from the words, they tended to follow the final consonants or vowels of the preceding words, forming a very long schwa like vowel (Bartkova, 2005).

3 Data and Methodology

The current section introduces the data and methodology incorporated in the present study. Section 3.1 is devoted to the data, and section 3.2 introduces the methodology of *interactional prosody* for analyzing sound realization in face-to-face interaction. Section 3.3 presents a detailed description of the annotation procedure for the prosodic profiles of and around the sites of initiation in recycling repair of both languages.

3.1 Data

Examples of French recycling repair were extracted from a Corpus of Interactional Data (CID), which consists of 8 hours of audio-video recorded spontaneous spoken French and contains about 110,000 words (cf. Bertrand et al., 2008; Blache et al., 2009). One of the features of the CID corpus is that the data has been processed automatically and annotated (both automatically and manually) on **multimodal** levels: not only the corpus metadata, but also the phonetic, prosodic/phonological, morpho-syntactic levels, as well as the level for gestures (Bertrand et al., 2008; Blache et al., 2009). Furthermore, it should be noted that the CID corpus has been annotated additionally with cases of French disfluency of different types. For the purpose of the current study, 150 instances of disfluent repetitions were selected out of the annotated instances of disfluent repetitions produced by 2 of the female French speakers who participated in the recording process for the compilation of CID.

On the other side, examples of Mandarin recycling repair were taken from two sources. The first source is a corpus of Mandarin recycling repair described in Chen (2011). The corpus consists of 260 instances of recycling repair culled from about 3.5 hours of video- and audio-taped face-to-face Mandarin interaction.[1]

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[1] The 3.5-hour conversational data includes 7 segments of two or multi-party Mandarin interaction over 10 female Mandarin speakers. For the ethnographic information of the interaction participants and the selection procedures for the

The second source is an on-going project of constructing a Mandarin corpus of conversational interaction following the French CID corpus (cf. Chen et al., 2012). Together 150 instances of Mandarin recycling repair produced by 6 native Taiwanese Mandarin interlocutors were selected for further acoustic analysis of the sound profiles of sites of initiation in the repair.

3.2 Methodology: on Interactional Prosody

As mentioned in Section 1, some of the past studies on repair within the field of CA have paid attention to the discussion of the relationship between prosody and interaction in conversation (cf. Schegloff, 1979; 1987). However, it is not until recently that interactional linguists have started paying attention to the systematic organization of phonetic and prosodic details in natural conversation. The approach *interactional prosody* (cf. Couper-Kuhlen and Selting, 1996; also *conversational phonology* by Kelly and Local, 1989) suggests incorporating the following theoretical points toward the study of the sound system of conversational interaction:

- The material considered derives entirely from naturally occurring face-to-face conversational interaction
- The analysis attempts to prejudge as little as possible the salience of phonetic features
- The analysis seeks explicitly to motivate and warrant the functional categories employed by reference to the observable behaviour of the conversational participants (Kelly and Local, 1989: 263)

Thus one of the features of the interactional prosody approach is that it advocates an 'impressionistic' analysis by closely listening to the production of real speech and notating phonetic details which a trained ear could perceive, including properties such as pitch, loudness, tempo, and others (Kelly and Local, 1989).

To analyze the sound production around and for the sites of initiation in recycling repair, the current study adopts the aforementioned methodology that combines both the acoustic measurements and the impressionistic analysis. Actually, such combinational approach has been used in a previous study on word repetitions in German speech by Benkenstein and Simpson

compilation of the recycling repair corpus, please refer to Chen (2011).

(2003). In the present study, the acoustic measurements were carried out by using the computer software Praat (© Boersma and Weenink, 2007). Additional judgments would be made based on the analyst's impressionistic interpretation of most of the auditory cues, following the impressionistic approach from interactional prosody. In the next section, various acoustic measurements made for R1 and R2 of each DR token will be described.

3.3 Annotations for Sound Profiles

In order to further compare the sound production around and at the sites of initiation in disfluent repetitions derived from both French and Mandarin interaction, the following annotations were noted for each instance of DR.

Pitch. The pitch height of the onset of R1 and R2 of each recycling repair was first measured then double-checked against the analyst's impressionistic judgments. Here the pitch height refers to fundamental frequency (F0). When recording the result of pitch height, however, we only noted the *relative* pitch height between R1/R2 of each DR (such as if R1 or R2 is perceived as in a higher pitch height). Furthermore, it should be mentioned that sometimes when the F0 difference between R1 and R2 was too small to be considered as hearable difference, the measurement of *semitone* would be incorporated to help determine if R1 and R2 might be perceived as realized at the same pitch height.

Duration. Duration refers to the length of R1/R2 of the repair, reported in milliseconds. The measurement of duration was taken starting from the onset to the ending of the syllable of the word or phrase in R1 and R2. Similar to the measurement for pitch height, the result of duration is reported in terms of relative duration between R1 and R2, i.e. if R1 or R2 is the longer segment of the DR.

Silence. The profile of silence recorded, in seconds, any audible pause located: a) before R1; b) in between R1 and R2; or c) after R2 of the repair. In the current research a cut-off point at 0.2-second has been applied, following Jasperson's study on focused English repair (1998). Any silent pause under 0.2 seconds was considered as part of the articulatory process (cf. Jasperson, 1998) and thus treated as having no significant impact on the processing of the repair. Silent pauses longer than 0.2 seconds, on the other hand, would be taken as serving possible function interactionally and were otherwise noted.

One place to point out is that, as the past discussion on French word repetitions also paid attention to filled pauses, here we took into consideration instances of DR with filled pauses located in between R1 and R2 as well.

Other prosodic cues- sound stretch and cut-off. The prosodic cue of sound stretch (or lengthening) records any perceptible prolongation on any syllable of R1 and R2 of the repair. To determine if there was perceivable sound stretches, the impressionistic judgments were made and the result was marked on the transcription of the interaction. When any lengthening has been observed, it would be marked, using the convention of the colon symbol ":".

The sound cue of cut-off is defined as an articulatory closure that interrupts the air stream, and it typically involves glottal or other stop closures (cf. Jasperson, 2002). To decide if there was a cut-off, the analyzer followed the impressionistic description of ways in which the cut-off is articulated, as proposed by Jasperson (1998; 2002). At least two types of cut-offs were distinguished: "glottalized" cut-offs, which have salient interruption glottalization, and "soft" cut-offs that have either unnoticeable or no interrupted glottalization (cf. Jasperson, 1998; 2002). The glottalized cut-offs were indicated by a percent sign "%" while the soft ones by a dash "-". Finally, as the current study concerns the sites of initiation in recycling repair, in the following results reported with regard to the sound cues of cut-off and lengthening we focus on mainly the DR instance in which R1 is followed immediately by the cut-off and/or lengthening.

4 Results

The current section describes the comparative results of acoustic measurements made on the R1/R2 of the DR in both languages. The results will be reported according to the annotation categories of acoustic measurements introduced in Section 3.3 above.

4.1 Pitch

As mentioned in 3.3, the measurement of pitch height is reported as the relative pitch realization perceived between R1/R2. Therefore the result of relative pitch height could be noted as realized in one of the following situations:

- R1 is the higher segment of the DR (Higher R1)
- R2 is the higher segment of the DR (Higher R2)
- R1 and R2 are perceived as realized in the same pitch height (Same)
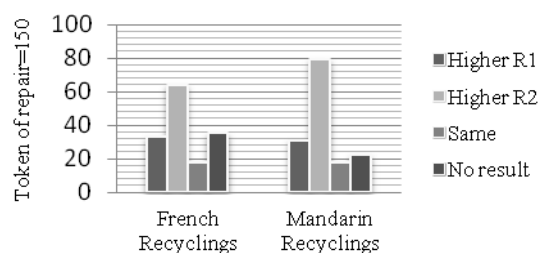- No comparable result could be yield as for which segment of R1/R2 is higher (No result)

Figure 1. The Result of Relative Pitch Height Perceived between R1/R2.

From Figure 1 it is demonstrated that for most of the DR instances in both languages R2 is perceived as relatively higher when executing the repair (For French recyclings: 64/150, 42.6%; Mandarin: 79/150, 52.7%). On the other hand, about 20% of the recycling instances in both languages are realized with higher R1 (For French DRs: 33/150, 22%; Mandarin: 31/150, 20.6%). The rest of the instances could be in the situation that R1/R2 are realized at the same pitch height (For French DRs: 18/150, 12%; Mandarin: 18/150, 12%), or when the relative pitch height between R1/R2 could not be determined perceptually (For French recyclings: 35/150, 23.3%; Mandarin: 22/150, 14.7%).

4.2 Duration

The result of the relative duration between R1/R2 of the DR is presented in Table 2.

	Longer R1	Longer R2	Total
French Recyclings	125 (83.3%)	25 (16.7%)	150 (100%)
Mandarin Recyclings	126 (84%)	24 (16%)	150 (100%)

Table 2. Comparative Result of Relative Duration between R1/R2.

As can be seen, for the recycling instances in both languages over 80% are realized with longer

R1. The result thus shows a strong preference over longer R1 while executing the repair. This is actually consistent with the findings from previous studies on the relative duration between raparandum and repair of disfluency/repair in spontaneous speech of various languages (cf. Bartkova, 2005; Shriberg, 1995; Tseng, 2006).

4.3 Silence

As depicted in Section 3.3, for the measurement of silence we noted three possible locations for interlocutors to pause for accomplishing the recycling, namely before R1, in between R1 and R2, and after R2. The following Table 3-a and Table 3-b summarize the results of number of instances with pauses occurring immediately prior to R1 and after R2 of the DR respectively.

	With Pause	Without Pause	Total
French Recyclings	8 (5.3%)	142 (94.7%)	150 (100%)
Mandarin Recyclings	36 (24%)	114 (76%)	150 (100%)

Table 3-a. Occurrences of Pause Right Preceding R1.

	With Pause	Without Pause	Total
French Recyclings	9 (6.0%)	141 (94.0%)	150 (100%)
Mandarin Recyclings	11 (7.3%)	139 (92.7%)	150 (100%)

Table 3-b. Occurrences of Pause Following R2 Immediately.

From Table 3-a, the French DRs seem to differ slightly from the Mandarin instances in terms of the silent pause occurred prior to R1: French recycling repairs are less likely to be preceded by pauses longer than 0.2 seconds, while for Mandarin recyclings about a quarter of examples have their R1 preceded by longer pauses. When turning to the pauses following immediately after R2, as can be seen in Table 3-b, we find that for the majority of the recycling instances in both languages there wouldn't be any perceivable silence located right after R2.
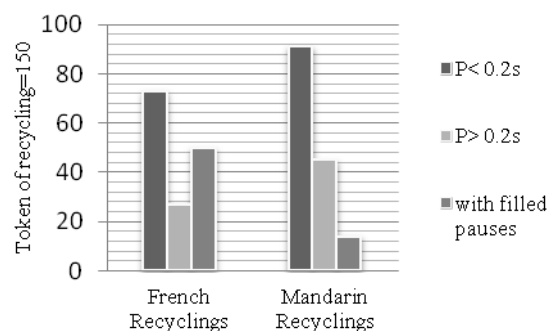

Figure 4. The Result of Pauses (P) and Filled Pauses Occurred in between R1/R2.

Figure 4 summarizes instances of recyclings with or without pauses in between R1 and R2. Based on the results, there are about 60.7% (91/150) of Mandarin recyclings that have their R1 followed directly by R2 (i.e. without additional pauses in between R1/R2 or only micro pause under 0.2 seconds), while less than half of French DR instances (48.7%, 73/150) have their R2 following R1 immediately without delay. Comparing to French recyclings, therefore, Mandarin speakers seem to have the tendency of executing the repair right after the initiation of the recycling without further delay. For recyclings with over 0.2-second pause in between R1/R2, 30% of Mandarin recyclings (45/150) have a longer, perceivable pause in between R1/R2, while about only 18% (27/150) of French DRs are realized this way. Finally, for instances with filled pauses in between R1/R2 of the DR, the two languages differ in that 33.3% (50/150) of French recycling instances were tagged with (one or more) filled pauses in between R1/R2, while this rarely happened in Mandarin recyclings (9.3%, 14/150). It is worth noting that the filled pauses located between R1/R2 of the French recyclings were found to be realized as brief as 100ms to as long as 1700ms.

4.4 Other Sound Cues: Sound Stretch and Cut-off

The annotations for the sound cues of sound stretch and cut-off at the end of R1 provide further information on how the recyclings are initiated in both languages. As presented in Table 5, speakers of the two languages seem to favor different methods of initiation: French speakers tend to initiate the recycling by the mean of prolongation at the end of R1 (59/150, 39.3%), while Mandarin speakers rely more on the cut-off at the end of R1 of the repair (67/150, 44.7%).

	Recycling initiated by lengthening	Recycling initiated by cut-off
French Recyclings	59/150 (39.3%)	18/150 (12%)
Mandarin Recyclings	41/150 (27.3%)	67/150 (44.7%)

Table 5. Summary of Tokens of Recyclings Initiated by Either Lengthening or Cut-off.

One place to add is that, from the summary presented in Table 5, by annotating instances of recycling initiated by lengthening or cut-off can only account for about half of the instances of French recyclings and about 70% of the Mandarin recyclings. Further examination shows that for French recyclings, there are about another 20% (31/150) of the instances that are realized with filled pauses in between R1/R2 of the recyclings. For the rest of the instances of DR in both languages, there can be neither cut-off nor lengthening perceived at the sites of initiation.

5 Discussion

5.1 From the Results of Acoustic Measurements

Based on the results presented in Sections 4.1 and 4.2, there seems to be a tendency for speakers of both languages to utilize the prosodic pattern of longer R1 followed by higher R2 while executing the recycling repairs. Such result is actually consistent with the general findings on the prosodic profiles for repair in French speech by Bartkova (2005) and Mandarin repair by Tseng (2006). It should be noted, however, that there are still recyclings in both languages that could be realized prosodically with R1 and R2 at the same pitch height, or when there's no perceivable result as for if R1 or R2 is realized in a relatively higher pitch. As shown in Chen (2011), Mandarin speakers can hold the same pitch height across R1/R2 of the recycling pair to reflect the specific function of *continuation* with the turn-so-far. Thus further exploration could be made with regard to how interlocutors in conversational interaction employ different prosodic cues while repairing in order to reflect any particular pragmatic function or in relation to interaction among the speakers and the sequential organization of the conversation. Still, there is about 23% and 14% of the French and Mandarin DR respectively that has been described as yielding no comparable result with regard to which segment of R1/R2 is higher in pitch, some possible explanations could be that, for one, the pitch realization while executing the repair could influenced by other factors such as speech rate. Another possibility could be that the pitch contour realized during recycling the word or phrase for repair is at the same time influenced by the global intonation contour from higher level discourse units.

In terms of the location of pauses, one consistent finding is that there were rarely cases in which speakers of both languages attach additional pauses after accomplishing the repair. The result implies that interlocutors simply carry on with the conversation after the recycling is accomplished without further delay. On the other hand, when turning to the pause located prior to R1, we find that for French recyclings there were rarely cases in which their R1s were preceded by perceivable pauses. Comparing to the DR instances by Mandarin interlocutors, it seems that Mandarin speakers may have slightly higher tendency of initiating the recyclings after perceivable pauses. Along the same line, it will be of further interest to explore if there exists any discrepancy between speakers of the two languages to initiate the repairs in terms of their locations within prosodic/intonation unit: i.e. if the Mandarin speakers have a higher tendency to initiate repair toward the beginning of the prosodic boundary, comparing to French interlocutors who may otherwise initiate the repair toward the middle or even later on within the intonation unit.

As for the pause located in between R1/R2 of the DR, since this is also the position for filled pauses that could be used as one of the methods of initiating repairs, we will discuss the result further in the next section.

5.2 Methods of Initiating Recycling Repair

Based on the results from Figure 4, the main differences between French and Mandarin DR in terms of the pauses located in between R1/R2 lies in that, French speakers incorporate more frequently the filled pauses while Mandarin interlocutors rarely do so in that specific location. Moreover, Mandarin interlocutors show a preference for immediately repairing right after the initiation of the DR, as demonstrated by the more frequently occurred instances with pause under 0.2 seconds in between R1/R2. Here we

will discuss in detail how the result sheds light on the different methods incorporated for initiating recycling repair in the two languages.

Initiating recycling repair in French interaction. According to Table 5, French interlocutors demonstrate a preference of sound stretch or prolongation at the end of R1. One of the examples taken from the French CID corpus is presented in (3):

(3) S : mais où est– ce que tu as **des:: des** feux d'artifice

but where is- what 2Sg get **some:: some** firework

"but where did you get **some:: some** fireworks…."

As can be seen, here the speaker makes use of the lengthening at the end of R1 in order to initiate the DR. After initiating the repair, the speaker follows up by directly repeating the same word **des** to accomplish the repair. When examining further the instances of French DR, we actually find cases in which the repair is initiated by a lengthened R1 and followed by a filled pause that is often lengthened as well:

(4) S: j'ai mis mes ski sur le dos puis j'ai commencé à descendre **à pied euh::::::↓ ↓ à pied** toute la station

1sg put Poss ski Prep Det back then 1sg Aux start to descend **Prep foot euh:::::: Prep foot** all Det resort

"I put my ski on the back then I started descend **by foot euh:::::: by foot** throughout the resot."

(5) S: **et**:=< **euh: (.) et** en même temps euh ils se sont excusés

and: euh: (.) and Prep same time euh 3pl apologize

"**and: euh: (.) and** at the same time euh they apologized…"

One place to point out based on the above instances of French DR is that, not only do French speakers favor initiating the recyclings by lengthening at the end of R1 followed by a lengthened filled pause (such as in (4)), also they tend to attach the filled pause immediately after the lengthened R1 (as shown in (5) by the transcription notation '=<' in between *et* and *euh*).[2] Actually, as mentioned in Section 2.3, Bartkova (2005) suggested that filled pauses in French speech tend to follow the final consonants or vowels of the preceding words in form of a

[2] This transcription notation '=<' indicates that the immediately following talk is 'jump-started' from the syllable prior to the symbol.

long schwa like vowel. From the perspective of interaction and turn-taking, while French interlocutors recycle the turn for repair, they may take advantage of the prolongations at the site of initiation, plus another (optional) lengthened filled pause, to further withhold the turn in order to gain time to accomplish the repair.

Initiating recycling repair in Mandarin interaction. Turning to the DR in Mandarin interaction, based on the result from Table 5, speakers tend to incorporate a cut-off at the end of R1 to initiate the repair. Moreover, based on the result summarized in Figure 4, Mandarin interlocutors incorporate less frequently longer pauses, even rarely filled pauses in between R1/R2. Thus the more commonly used method of initiating and accomplishing recycling repair by Mandarin speakers can be described as a quick initiation by the cut-off at the end of R1, followed immediately by the direct repetition in R2 without further delay. One of such Mandarin recycling instances derived from the Mandarin CID corpus is shown in the following (6) (similarly see also the repair instance in example (2) presented previously):

(6) S:喔:那- 可是那個- **[R1]** 那個**[R2]**Y是%(.) 是韓國人

S: o: nà- kěshi **nàge- nàge** Y shì%(.) shì hánguórén.

Ex Det but **Det- Det** Y be% (.) be Korean

"Oh that- but **that- that** Y is% (.) is Korean."

When the speaker recycles the determiner *nage* "that" there is a cut-off at the end of R1, which otherwise facilitates a quick start at the site of initiation in repairing. To accomplish the repair process, the interlocutor immediately follows up with a direct repetition of the same lexical item without additional pause. This method of initiating the repair, therefore, is rather different from the way in which French interlocutors recycle to repair by the lengthening at the end of R1 then followed optionally by a filled pause.

Last, but not the least, as suggested from the result presented in Figure 4, Mandarin speakers rarely incorporate filled pauses in between R1 and R2 of the recyclings. The following (7) and (8) present 2 of the 14 Mandarin DR instances that were executed with filled pauses (PF) after the sites of initiation:

(7) A:然後就是**[R1]:::**嗯**::** (.8) 就是**[R2]**要讓 他們覺得有來:: (.7) 付費有收到:實惠的那 種感覺

A: ránhou **jìushi::: en:::** (.8) **jìushi** yào ràng tāmen juéde yǒu lái:: (.7) fùfèi yǒu shōudào: shíhuì de nàzhǒng gǎnjué

Then **just::: PF** (.8) **just** Aux let 3pl feel have come:: (.7) pay have received treat DE DET kind feeling

"Then (it's) **just::: en:::** (.8) **just** to let them feel that (since) they've paid, they should get something equal in return."

(8) X:然後所以**那個老闆-[R1]**(.)**就是** (.4) **那個 老闆[R2]**跟: (.) J 說

X: ránhou suóyǐ **nàge lǎobǎn-** (.) **jìushi** (.4) **nàge lǎobǎn** gēn: (.) J ↓shūo:

Then so **Det boss** (.) **PF** (.4) **Det boss** Prep (.) J say

"And then, so, **the professor** (.) **just** (.4) **the professor** told J…"

In (7), the recycling is initiated by a lengthening at the end of R1, followed by the lengthened filled pause *en* in lengthening. Here when the speaker recycles the lexical item *jìushi* "just", she has incorporated a method of initiation similar to the French DR instance presented in (4). While in (8), on the other hand, the recycling of the NP *nàge lǎobǎn* "the boss (lit.)/ the professor" is initiated by the cut-off at the end of R1, followed by a brief pause then the filled pause *jìushi*. Given that only limited number of Mandarin DR instances were identified to co-occurr with filled pauses in between R1 and R2, more data will be required to examine further how speakers in Mandarin interaction may employ filled pauses in the process of repairing and in initiating the repair.

6   Summary and Future Research

The current paper presents the study that applies the data derived from comparative corpora of interactional data in French and Mandarin for the analysis of sound profiles in and around the sites of initiation in recycling repair/disfluent repetitions. 150 examples of DR in both languages were culled from the comparative corpora of conversational interaction in both languages. By the approach of interactional prosody plus impressionistic judgments, the relative acoustic measurements of and around R1/R2 of the recycling repair were made and then compared. The goal of the comparative study is to identify the sound patterns adopted at the sites of initiation in accomplishing the DR in both languages. The findings suggest that Mandarin and French speakers may resort to different methods for initiating the recyclings:

while French interlocutors may employ sound stretch at the end of R1 plus lengthened filled pause(s) at the site of initiation in repair, Mandarin speakers incorporate more frequently cut-offs at the end of R1, followed immediately by R2 for accomplishing the repair.

For future research, in addition to some possible points for further research already mentioned in the discussion sections, the result from current study may be implemented for further cross-linguistic analyses on how the sound realization for initiating the repair might be correlated with the turn-taking between the speakers and the sequential organization of the conversations: i.e. if the longer initiation process in French DR may be used by the speakers to withhold the turn and thus prevent other interlocutors from intervening the continuation of the turn-so-far by the current speaker; or if the tendency of locating Mandarin repair near pauses (cf. when the DR follows pauses) may otherwise reflect a different turn-taking system between or among interlocutors at or near to the transition-relevant places.

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References

Bartkova, Katarina. 2005. Prosodic Cues of Spontaneous Speech in French. In *Proceeding of Disfluency in Spontaneous Speech* (*DiSS'05*), 21-25. Aix-en-Provence, France.

Benkenstein, Ramona and Adrian Simpson. 2003. Phonetic Correlates of Self-repair Involving Word Repetition in German Spontaneous Speech. In *ISCA Tutorial and Research Workshop on Disfluency in Spontaneous Speech* (*DiSS'03*), 81-84. Göteborg, Sweden.

Bertrand, Roxane, Philippe, Blache, Robert, Espesser, Gaëlle, Ferré, Christine, Meunier, Beatrice Priego-Valverde, and Stéphane Rauzy, 2008. Le CID - Corpus of Interactional Data - Annotation et Exploitation Multimodale de Parole

Conversationnelle. *Traitement Automatique des Langues*, 49:105-134.

Blache, Philippe, Roxane Bertrand, and Gaëlle Ferré. 2009. Creating and Exploiting Multimodal Annotated Corpora: The ToMA Project. In M. Kipp et al. (Eds.) *Multimodal Corpora: From Models of Natural Interaction to Systems and Applications*. Springer Berlin Heidelberg. 38-53.

Boersma, Paul and David Weenink. 2007. *Praat: Doing Phonetics by Computer*. Online: http://www.praat.org, accessed on 20 Nov, 2007.

Chen, Helen Kai-yun. 2011. *Sound Patterns in Mandarin Recycling Repair*. Ph.D. dissertation, University of Colorado at Boulder.

Chen, Helen Kai-yun, Laurent, Prévot, Roxane, Bertrand, Beatrice, Priego-Valverde, and Blache, Philippe. Toward a Mandarin-French Corpus of Interactional Data. 2012. In *The 16th Workshop on the Semantics and Pragmatics of Dialogues*. Paris, France.

Couper-Kuhlen, Elizabeth and Margret Selting. 1996. Towards an Interactional Perspective on Prosody and a Prosodic Perspective on Interaction. In Elizabeth Couper-Kuhlen and Margret Selting (Eds.) *Prosody in Conversation: Interactional Studies*. Cambridge: Cambridge University Press. 11-56.

Fox, Barbara, Makoto Hayashi, and Robert Jasperson. 1996. Resources and Repair: A Cross-linguistic Study of the Syntactic Organization of Repair. In Elinor Ochs, Emanuel Schegloff, and Sandra Thompson (Eds.), *Interaction and Grammar*. Cambridge: Cambridge University Press. 185–237.

Fox, Barbara, Fay Wouk, Makoto Hayashi, Steven Fincke, Liang Tao, Marja-leena Sorjonen, Minna Laakso, and Wilfrido Hernandez. 2009. A Cross-linguistic Investigation of the Site of Initiation in Same-turn Self-repair. In John Sidnell (Ed.), *Conversation Analysis: Comparative Perspectives*. Cambridge: Cambridge University Press. 61-103.

Henry, Sandrine. 2002. Étude des répétitions en français parlé spontané pour les technologies de la parole. In *Actes de la 6ème Rencontre des Etudiants Chercheurs en Informatique pour le Traitement Automatique des Langues (RECITAL'02)*, 467-476.

Henry, Sandrine and Berthille Pallaud. 2003. Word Fragments and Repeats in Spontaneous Spoken French". In *ISCA Tutorial and Research Workshop on Disfluency in Spontaneous Speech* (*DiSS'03*), 77-80. Göteborg, Sweden.

Jasperson, Robert. 1998. *Repair after Cut-off: Explorations in the Grammar of Focused Repair of the Turn-constructional unit-so-far*. Ph.D. dissertation, University of Colorado at Boulder.

Jasperson, Robert. 2002. Some linguistic aspects of closure cut-off. In Cecilia Ford, Barbara Fox, and Sandy Thompson (Eds.) *The language of turn and sequence*. Oxford: Oxford University Press. 257–286.

Kelly, John and John, Local. 1989. *Doing Phonology: Observing, Recoding, Interpreting*. Manchester: Manchester University Press.

Levelt, Willem. 1983. Monitoring and Self-repair in Speech. *Cognition* 14: 41–104.

Levelt, Willem and Anne Cutler. 1983. Prosodic Marking in Speech Repair. *Journal of Semantics* 2: 205-217.

Schegloff, Emanuel. 1979. The Relevance of Repair to Syntax-for-conversation. In Talmy Givón (Ed.), *Discourse and Syntax*. London: Academic Press. 261–286.

Schegloff, Emanuel. 1987. Recycled Turn Beginnings: A Precise Repair Mechanism in Conversation's Turn-taking Organisation. In Graham Button and John Lee (Eds.) *Talk and Social Organisation*. Clevedon Avon: Multilingual Matters. 70–85.

Schegloff, Emanuel, Jefferson Gail and Sacks Harvey. 1977. The Preference for Self-correction in the Organization of Repair in Conversation. *Language* 53: 361–382.

Shriberg, Elizabeth. 1994. *Preliminaries to a Theory of Speech Disfluencies*. Ph.D. dissertation. University of California at Berkeley.

Shriberg, Elizabeth. 1995. Acoustic Properties of Disfluent Repetitions. In *Proceedings of the International Congress of Phonetic Sciences*, (*ICPhS* 95') 4: 384–387.

Tseng, Shu-Chuan. 2003. Repairs and Repetitions in Spontaneous Mandarin. In *ISCA Tutorial and Research Workshop on Disfluency in Spontaneous Speech* (*DiSS'03*), 73-76. Göteborg, Sweden.

Tseng, Shu-Chuan. 2006. Repairs in Mandarin Conversation. *Journal of Chinese Linguistics*, 34: 80-120.