Fluency in dialogue:

The effect of speech rate and turn-taking behaviour on fluency ratings

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Abstract

In language learning, fluency is a term that is often used. Studies investigating fluency perception often make use of monologues, while natural conversation usually occurs in dialogues. The present study investigated the effect of speech rate and gaps and overlaps between turns in a dialogue on perceived fluency ratings. This was done by acoustically manipulating speech rate (fast vs. slow) and the time between question and answer turns in short dialogues (delay steps of -600, -300, 0, +300, +600, +900 ms). In an experiment, listeners were then asked to rate the fluency of the speaker giving the answer on a nine-point scale. Results showed, firstly, an effect of speech rate: Fast answers were rated as more fluent than slow ones. Secondly, results showed an interaction between speech rate and delay step. In slow speech, overlapping speech was rated as slightly more fluent than larger gaps, while in fast speech larger gaps were rated as more fluent than overlap. These findings carry implications for the language testing practice, as present fluency assessments based on monologues do not capture every day communication where fluency judgements are at least partially based on turn taking behaviour.

1. Introduction

1.1 The present study

Learning a new language is a difficult and lengthy process. Compared to native speakers, non-native speakers struggle with the language's vocabulary, grammar, pronunciation, and pragmatic rules. Yet, many people are concerned with learning a second language well and aim to become fluent in this language. This is the case for example for immigrants who want to become part of their new society, students studying abroad, or simply people learning a new language to communicate with others.

Definitions of the term 'fluency' of spoken language used by non-linguists tend to focus on speaking abilities of second language speakers, who, when fluent, sound native-like. This seems to imply that all native speakers of a language speak fluently, and with the same degree

of fluency. However, listening to several native speakers of one's own language likely reveals that this is not the case. One speaker might indeed speak fluently, with few pauses, restarts, or corrections, while another speaker constantly stumbles over their words. Additionally, there is variation within one speaker as their emotional state, speech register, and audience changes (Bortfeld, Leon, Bloom, Schober, & Brennan, 2001).

Objectively, it is not clear how to define fluency both in native and non-native speech, as many different factors play a role, as well as the purpose of the definition (Chambers, 1997; Götz, 2013). Above we mentioned disfluencies such as pauses, restarts, and corrections, but possibly other factors play a role as well. Typically, fluency is used as a construct in the language testing practice, where speaking skills make up an important part of the overall assessment (Iwashita, Brown, McNamara, & O'Hagan, 2008). The highest level of the Cambridge English Qualifications expects candidates to have "many features, including pausing and hesitating, [that] are 'native-like'" (Ffrench, 2003:15). Many language tests make use of monologues to assess learners' spoken fluency. However, in everyday conversation, we do not tend to hold endless monologues, but we rather are engaged in dialogues with others. As such, how fluent a speaker is perceived to be might not depend solely on the quality of their speech in isolation, but also on the interaction with their interlocutor(s).

The present study aimed to contribute to the field of fluency research by investigating what factors influence fluency perception in *dialogue*. Specifically, we tested the effect of gaps and overlaps between question and answer turns in a dialogue between native speakers of Dutch. This paragraph will continue to give an overview of the theoretical background (section 1.2), followed by the research question and hypotheses (section 1.3). Subsequent paragraphs will deal with methods (section 2) and results (section 3). Finally, the findings of this study will be discussed (section 4).

1.2 Theoretical background

1.2.1 Definitions of fluency

Several studies have tried to define fluency in second language speech. In an influential paper, Lennon (1990) distinguishes two senses of fluency: Fluency in the 'broad' sense and fluency in the 'narrow' sense. Fluency in the broad sense can be seen as another term for oral proficiency in general. It encompasses speech that is grammatically correct, that uses a large vocabulary

and that is pronounced in a native-like way. This is the definition most often used in everyday life when we say sentences like '*He is fluent in Italian'.* (Chambers, 1997). In contrast, fluency in the narrow sense constitutes only one component of oral proficiency, that deals with the flow and smoothness of the speech, and focuses on producing speech at a speech rate similar to native speakers of the language, without pauses, hesitations, fillers, and corrections. Lennon states that "fluency is an impression on the listener's part that the psycholinguistic processes of speech planning and speech production are functioning easily and efficiently." (1990:391).

Segalowitz (2010) uses a cognitive perspective to define fluency. He distinguishes three senses of fluency: cognitive fluency, utterance fluency, and perceived fluency. Cognitive fluency refers to the speaker's ability to efficiently coordinate the cognitive processes needed for speech production. Utterance fluency refers to the features of an utterance than can be measured acoustically, such as speech rate, pauses, and repairs. Perceived fluency refers to the impression listeners make with regards to the speaker's cognitive fluency, based on the speech signal. The present study is concerned with fluency in the narrow sense, and in particular the relationship between utterance fluency and perceived fluency.

1.2.2 Components of second language fluency

Studies that investigated the relation between utterance fluency (objective acoustic measurements) and perceived fluency (subjective ratings by listeners) have identified several components of second language fluency.

Bosker, Pinget, Quené, Sanders and De Jong (2013) investigated the contribution of pauses, speech rate, and repairs, measured acoustically, on perceived fluency. They used six objective measures of fluency, calculated on spoken time excluding silences. These measures were the mean length of syllables, the number of silent pauses per second spoken time, the number of filled pauses per second spoken time, the mean length of silent pauses, number of repetitions per second spoken time, and the number of corrections per second spoken time. Results showed that the number and mean length of silent pauses and speech rate are most strongly related to fluency perception.

Other studies found that non-native speakers who are perceived as more fluent, use less hesitations, fewer pauses (both filled and silent), and have a faster speech rate (Chambers, 1997; Cucchiarini, Strik, & Boves, 2002; Lennon, 1990, Rossiter, 2009; Segalowitz, 2010).

1.2.3 Native fluency

Typically, native speakers are seen as fluent by default (Davies 2003; Riggenbach 1991), but individual variation in fluency can be found also between native speakers of a language, for example based on age or gender of the speaker (Bortfeld et al., 2011). While relatively few studies have investigated fluency in native speakers, some have compared native and non-native speakers in comparable tasks (see Götz (2013) for an overview for English).

Bosker, Quené, Sanders, and De Jong (2014) investigated perceived fluency in both native and non-native speech, and particularly focused on the question whether fluency characteristics in native speech on the one hand and non-native speech on the other are evaluated similarly by listeners. They conducted two experiments with acoustic manipulations, which allowed them to draw conclusions on the causal effects of particular fluency characteristics. In the first experiment silent pauses were manipulated, while in the second experiment speech rate was manipulated. Results showed that for both native and non-native speech, increasing the number of silent pauses and lengthening the duration of silent pauses had a negative effect on fluency ratings. There was no difference in the size of this effect between natives and non-natives. With regards to speech rate, a decrease in fluency ratings was found when slowing down native speech to the non-native level, and an increase in fluency ratings was found for non-native speech sped up to the native level. Notably, the relative decrease and increase were of similar magnitude. This suggests that a single silent pause or a particular speech rate is weighed similarly in native and non-native fluency perception. As such, Bosker et al. concluded that the relationship between utterance fluency and perceived fluency is similar for native and non-native speakers.

Kahng (2014; 2018) investigated how silent pause distributions in both L1 and L2 speech affect raters' fluency judgements. Results showed a similar effect of pause distribution on both L1 and L2 speech, where speech without pauses was rated as more fluent than speech with pauses either between or within clauses, and where speech with pauses between clauses was judged to be more fluent than speech with pauses within clauses. These results, combined with those of Bosker et al. (2014) suggest that those aspects of speech affecting fluency ratings of non-native speakers, namely speech rate, and use of pauses and hesitations, also affect the perception of native speakers in a similar way. Insights from the present study investigating fluency in native speakers can thus also be applied to non-native speakers.

1.2.4 Managing dialogues

In a dialogue there is by definition more than one interlocutor. These interlocutors constantly change roles from being the one who is speaking to being the one who is listening. Changing roles is done by turn-taking. Speakers of all languages aim to avoid overlapping turns and at the same time try to minimize the pauses between turns (Sacks, Schegloff, & Jefferson, 1978; Stivers et al., 2009). Using a worldwide sample consisting of ten different languages, Stivers and colleagues investigated the timing of turn-taking in polar questions. Results showed that the temporal relation between the answer and the question was a unimodal distribution, with each language-specific mode between 0 and +200 ms and the overall mode at 0 ms. The mean time between the question and the answer was +208 ms, with language-specific means ranging from +7 to +469 ms. They concluded that the language-specific means fell within approximately 250 ms on either side of the cross-linguistic mean. These results show that interlocutors aim to have either no overlap or just a short gap with an average length of 200 ms between two turns. As producing an utterance of a single word takes about 600 ms (Indefrey & Levelt, 2004), listeners have to be very tuned into the speaker to manage to start their turn so quickly.

Studies have shown that deviating from this no-gap-no-overlap strategy has communicative significance. Longer gaps might signify problems in comprehension (Beňuš, Gravano, & Hirschberg, 2011), speech planning difficulties (Bull & Aylette, 1998), or production of disconfirmative responses and nonanswers (Stivers et al., 2009). Speakers who produce larger gaps between their turn and that of the other speaker are seen as less affiliative and more distancing, as the speaker is judged as less willing to comply with a request or agree with the other speaker (Roberts, Margutti, & Takano, 2011). Speakers who produce overlapping turns are seen as less affiliative as well (Van Leeuwen, 2017), as less agreeable and as more assertive (Maat, Truong, & Heylen, 2010; Robinson & Reis, 1989), as more dominant (Beňuš et al., 2011), and as less sociable (Robinson & Reis, 1989) compared to speakers who do not produce overlapping turns. Additionally, overlaps are linked to displays of power and control, and seen as rude and disrespectful (Goldberg, 1990).

1.2.5 Fluency in dialogues

Notably, the definitions of fluency mentioned earlier are all focusing on the speech of the language learner *in isolation*. However, in everyday life, speech is not produced in isolation,

but rather in collaboration with other speakers. As McCarthy noted, “fluency also involves the ability to create flow and smoothness across turn-boundaries and can be seen as an interactive phenomenon in discourse” (2010:1). He proposes the term *confluency* to refer to the joint process of two speakers who cooperate to each other’s fluency. Here he focuses particularly on turn-openings and turn-closings, as these show how fluency is constructed interactively between speakers. The speakers in a dialogue share the responsibility to create and maintain a flowing conversation and fill silences.

Galaczi (2013) investigated how language learners manage interaction in paired speaking assignments. Quantitative and qualitative analyses of turn-taking management showed that speakers that are more proficient are better able to create confluence than less proficient speakers. Speakers with a lower proficiency level tend to have a weak alignment with longer pauses between turns, while speakers with a higher proficiency level show rapid speaker changes and typically manage their turns in a no-gap-no-overlap way, as is preferred by native speakers.

In the language testing practice, several formats of speaking assessment are being used. Usually, these make use of monologue tasks. For example, the official Dutch as a second language exams contain a speaking assessment where the candidate sits in front of a computer and records several speaking assignments (College voor toetsen en examens, 2017). A similar procedure is used in the Test of English as a Foreign Language (TOEFL), where candidates record spoken responses to several questions, which are then scored by raters. Other speaking assessments make use of dialogue settings, such as the official Cambridge English qualifications. Here two candidates are tested at the same time, and they speak with each other and with a test leader. Candidates are assessed on ‘Interactive Communication’, which refers to the candidate’s sensitivity to turn-taking (Ffrench, 2003), or interactional competence. However, there are several challenges when it comes to assessing language learners’ interactional competence (Galaczi & Taylor, 2018). Importantly, interactional competence comprises many different elements, which makes it difficult to define the concept clearly and completely. In many cases, it is only vaguely described in raters’ instructions, complicating objective assessments of learner’s interactional competence. Another challenge with regards to speaking assessment in pairs is the question how scores should be assigned to individuals based on a jointly constructed interaction. Better knowledge on how dialogue settings affect language fluency will help create narrower definitions for raters and in that way more objective assessments of language proficiency.

1.3 Research questions and hypotheses

Studies have shown that speakers prefer no-gap-no-overlap between turns in a dialogue (Sacks et al., 1978; Stivers et al., 2009), and that non-native speakers improve their dialogue management skills as they improve their second language proficiency (Galaczi, 2013). However, no study, to our knowledge, has investigated how turn taking behaviour contributes to the perception of fluency in natives in dialogue.

The aim of the present study was to fill this gap. If turn taking behaviour has an effect on fluency ratings, even when raters are not specifically instructed to pay attention to this aspect of the dialogue, then these findings carry important implications for language testing and the assessment of fluency. In the present study, we investigated the effect of various delay steps, namely overlaps (-600 ms and -300 ms) or gaps (0 ms, +300 ms, +600 ms, and +900 ms) between the turns of a question-answer conversation between native speakers on fluency ratings. Additionally, the speaking rate (fast / slow) of the answer was manipulated. It was expected that results would show an effect of speaking rate, where fast recordings would yield higher fluency scores than slow recordings, as studies have shown that faster speech is seen as more fluent than slower speech (Bosker et al., 2013). Replicating these findings would show that the manipulation in the present experiment was valid and that the experiment was measuring fluency in a way it was intended.

With regards to the effect of overlap and gap, it was expected results would show lower fluency scores for larger gaps between the question and answer, as longer pauses are associated with less fluent speech, also for native speakers (Bosker et al., 2014; Götz, 2013). The longer pause signals that the speaker needs more time to formulate the answer, thus being less fluent. As interlocutors of a wide variety of languages prefer the no-overlap-no-gap strategy for turn taking management (Stivers et al., 2009), it was expected that the fluency ratings would be higher for a gap of 0 ms than for larger gaps. High fluency ratings were also expected for the overlap conditions, as in these cases the speaker apparently is able to quickly formulate and produce the response to the question that was asked. No specific interaction effects between speech rate and delay were hypothesized.

Additionally, given the size of the sample, some exploratory analyses of the data will be carried out to find trends with regard to speakers and listeners.

2. Method

2.1 Participants

Forty-nine participants were recruited from the Max Planck Institute for Psycholinguistics participant pool. Informed consent was obtained before the experiment and all were paid for their participation. Data of one participant was lost due to technical problems. Thus, the responses of forty-eight participants were analysed. All participants were native speakers of Dutch with normal hearing. The mean age of the group was 22.3 years (*SD* = 2.47), fourteen participants were male.

2.2 Materials

Eighty question-answer pairs were constructed, consisting of forty different questions and eighty different answers, two per question. The questions had every-day topics like hobbies, holiday plans, and the weather. The questions were structured such that it was plausible that the answer could be given before the end of the question. The answers had a length ranging from 19 to 44 syllables, with a mean of 33.4 syllables. An example of a question-answer pair can be found in Example 1. For an overview of all eighty question-answer pairs, see the Appendix.

Example 1. English translation in *italics.*

> Q: Hoe reis je naar je werk, normaal gesproken?
>
> *Q: How do you travel to work, normally speaking?*
>
> A: Ik ga altijd met de auto. Ik woon vrij ver van mijn werk en het is voor mij niet handig om de trein te nemen.
>
> *A: I always go by car. I live quite far away from work and it's not convenient for me to take the train.*

Recordings were made of ten native Dutch speakers (two were male) reading eight questions and eight answers each. Lists were made so that no speaker answered the questions they read themselves, and so that when Speaker B answered questions by Speaker A, Speaker A did *not*

answer questions by Speaker B. All speakers were instructed to read the sentences in a natural way, as part of a natural dialogue, and were told that it did not matter if they hesitated or corrected themselves. All participants read their questions and answers twice.

All questions and answers were isolated from the recordings using Praat (Boersma & Weenink, 2013), and for each the best was selected from the two recorded versions. The recordings of the questions had a mean length of 2.51 seconds (*SD* = 0.62), the recordings of the answers had a mean length of 6.40 seconds (*SD* = 1.34 s). The intensity of all questions and answers was scaled to 65 dB. A 2 (speech rate) x 6 (delay) design was used in the experiment. The speech rate of the answer was either linearly compressed by a factor of 0.833 (using PSOLA in Praat), so that it was sped up, or expanded by a factor of 1/0.833 = 1.2, so that it was slowed down. These factors were also used by Bosker et al. (2014), who compared native and non-native speech, and found that a large majority of participants (85%) judged these speech rates to be natural. The speech rate of the questions was not manipulated. The delay between the question and the answer was manipulated in Praat to have an overlap of 600 ms or 300 ms, be 0 ms, or have a gap of 300 ms, 600 ms or 900 ms. This resulted in twelve unique conditions.

Four questions and the eight corresponding answers were excluded as at least one of the answers sounded unnatural as a reply to the question. This resulted in 72 question-answer pairs used in the experiment. There were also four practice trials, which consisted of the four most naturally sounding question-answer pairs from the excluded items. As such, neither the practice questions nor answers were repeated in the experimental trials. Two of the four practice trials were presented in the fast condition, and two in the slow. None of these practice trials contained the extreme overlap of 600 ms or extreme gap of 900 ms. All participants heard the same four practice trials, in the same order.

2.3 Design

The experimental items were arranged in a Latin Square design: participants heard each question-answer pair in only one of the twelve conditions, but heard all conditions during the experiment. There were twelve different pseudo-randomised lists of the stimuli. Each list consisted of mini blocks of ten speakers, so that the answers in the trials in a given mini block were spoken by different speakers. Here it was made sure that the same question would not be presented twice in a row, and that the answers of two consecutive trials across mini block boundaries were not produced by the same speaker. All twelve lists were reversed, resulting in

twenty-four different orders of experimental items. Each list contained the same number of fast items and slow items (n = 36), and each delay step occurred twelve times.

2.4 Procedure

The experiment was run using Presentation software. The experiment was conducted in a sound-treated booth and the audio was presented over headphones at a comfortable volume. Before the experimental task started, participants signed the informed consent sheet, and the experiment leader gave a short introduction to the task. The experiment started with written instructions, presented on the screen. Participants were told that we were interested in how listeners perceived fluency in different speakers. They were instructed to listen to question-answer pairs and rate the fluency of the second speaker, that is, the talker who gave the answer. They should do this using a nine-point scale ranging from 'not fluent at all' on the lower end of the scale, and 'very fluent' on the higher end of the scale (Bosker et al. 2013). They were instructed to do this *not* based on fluency in the broad sense (i.e., overall language proficiency, as in: "he is fluent in French"), but rather base their judgements on the use of filled and silent pauses, speech rate, and use of hesitations and corrections, thus focusing on fluency in the narrow sense (Bosker et al., 2013). Instructions to judge fluency in the narrow sense have been used by previous fluency perception studies (Bosker et al., 2013; Derwing, Rossiter, Munro, & Thomson, 2004; Rossiter, 2009) and are compatible with instructions given to raters of language tests. Participants were warned that all speakers were native speakers, but were instructed to use the whole scale from 1 to 9 nonetheless. Importantly, participants could only make their judgements after the entire speech segment had played. The could only listen to each recording once. The participants read the instructions self-paced, and then started with four practice trials. If there were no further questions, they continued with the experiment. Halfway through the experiment there was a short self-timed break. After all 72 trials, the participant filled out a short post-experimental questionnaire investigating whether they noticed anything about the recordings and what they thought of the experiment. Finally, participants were debriefed.

3. Results

3.1 Behavioural results

In the post-experimental questionnaire, participants were asked open questions on what they thought was the goal of the experiment, on whether they noticed anything in particular, and on whether or not they thought the recordings sounded natural. Qualitative inspection of the answers showed that about half of the participants, namely 54.2%, noticed that speech rate was manipulated. Half of these participants (27.1%) commented that only the fast recordings sounded unnatural. Most participants commented that while most recordings sounded natural, only some sounded accelerated or slowed down. This suggests that there was variation across speakers or listeners, as in fact all recordings were rate manipulated. Only four of the participants (8.3%) noted that the answer sometimes started before the question was finished, but this did not lead to unnatural-sounding fragments.

Many participants used (almost) the whole scale from 1 to 9 to make their fluency judgements (n = 22 used the whole scale, n = 14 used the scale from 2 to 9). Remaining participants had a bias for the higher end of the scale. The overall mean fluency judgement score was 6.06 (SD = 1.98). The mean fluency judgement scores for each condition can be found in Table 1, together with the grand means for each delay step and both speech rates. Standard deviations are given between brackets. These results suggest that participants rated the fast recordings as more fluent than the slow recordings, and the recordings with 0 ms overlap between the question and answer (no gap and no overlap) were rated as most fluent of all delay steps. Means and standard errors for each condition are plotted in Figure 1 below.

3.2 Statistical analysis

Participants' fluency ratings (scores 1 to 9) were entered into a Linear Mixed Model (LMM; Baayen, Davidson, & Bates, 2008) as implemented in the lme4 library (Bates, Maechler, Bolker, & Walker, 2015) in R (R Development Core Team, 2012). The predictors Speech Rate, which was a categorical variable with the fast condition mapped onto the intercept, and Delay Step, which was a continuous variable scaled around the mean, together with their interaction, were entered as fixed effects. Participants, Items, and Speakers were entered into the model as random effects. Statistical significance was assessed at the 0.05 significance level by checking whether effects had absolute t-values exceeding 2 (Baayen, 2008).

Table 1 Means and standard deviation (between brackets) of the fluency scores in both rate conditions and all gap/overlap conditions (negative values indicate overlap, positive values are gaps), ranging on a scale from 1 (not fluent at all) to 9 (very fluent).

	-600 ms	**-300 ms**	**0**	**+300 ms**	**+600 ms**	**+900 ms**	**Overall**
Fast	6.51 (1.97)	6.67 (1.81)	6.93 (1.67)	6.93 (1.62)	6.84 (1.70)	6.86 (1.68)	6.79 (1.75)
Slow	5.38 (1.98)	5.42 (1.94)	5.45 (1.96)	5.28 (1.99)	5.23 (1.84)	5.27 (1.86)	5.34 (1.93)
Overall	5.94 (2.05)	6.04 (1.98)	6.19 (1.96)	6.11 (1.99)	6.03 (1.95)	6.06 (1.94)	6.06 (1.98)

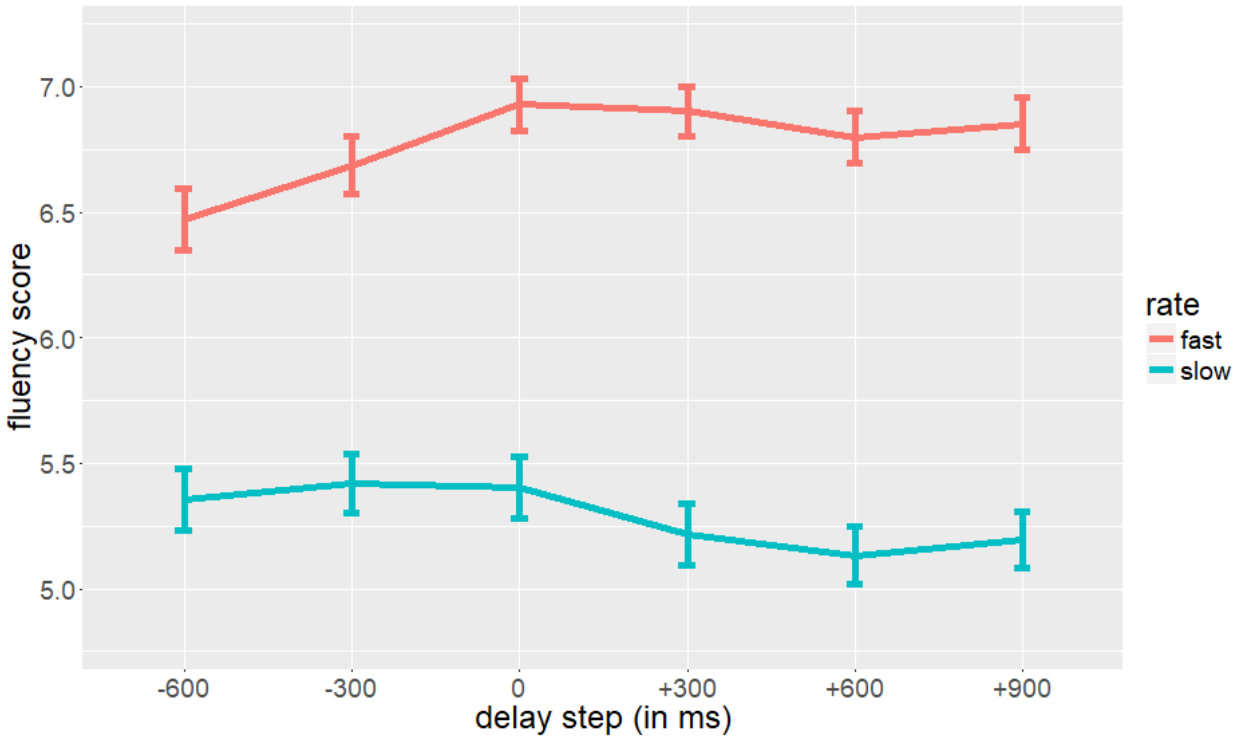

Figure 1 Mean fluency ratings for each condition. Error bars show standard error.

This model revealed a significant effect of Speech Rate: Fluency judgements were lower for slow fragments than for fast fragments (β = -1.451, *SE* = 0.050, *t* = -29.053). Additionally, the model revealed a significant effect of (scaled) Delay Step: Fluency judgements were slightly higher for fragments with a larger Delay Step (β = 0.111, *SE* = 0.035, *t* = 3.151). Note, however, that this effect of Delay Step should be interpreted only with respect to the fast condition, since this condition was mapped onto the intercept. In fact, the model also revealed a significant interaction of Speech Rate and Delay Step (β = -0.174, *SE* = 0.050, *t* = -3.486). This interaction indicates that, where there was a positive effect of Delay Step in the fast condition, there was a negative effect of Delay Step for slow speech fragments. A mathematically equivalent model, this time mapping the slow condition onto the intercept, indeed showed a marginally negative effect of Delay Step (β = -0.063, *SE* = 0.035, *t* = -1.779).

3.3 Exploratory analyses

Figure 2 shows the mean fluency score per condition for each of the ten speakers. In each panel, the fluency scores given to a specific speaker on the whole of the experiment, and by all listeners, are plotted for each delay step and both speech rates. The different panels show

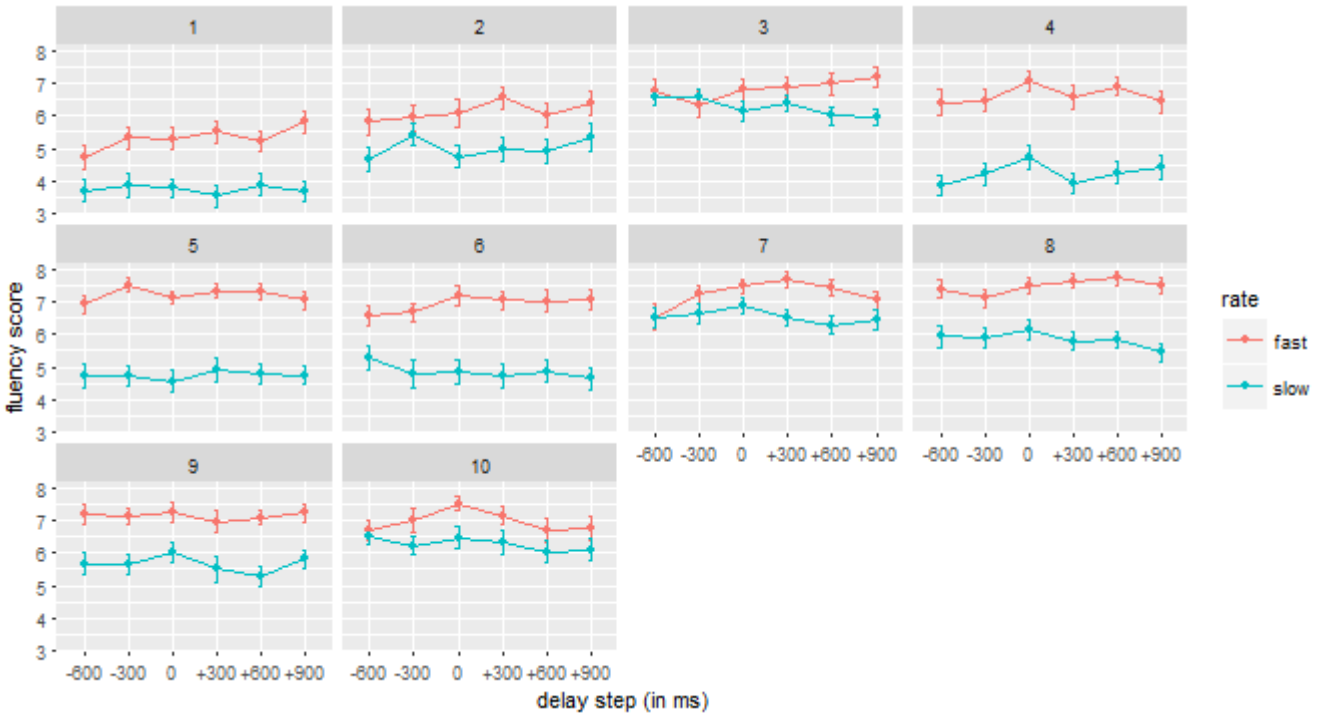

Figure 2 Mean fluency ratings for each condition per speaker. Error bars show standard error.

that some speakers were judged to be more fluent than others, and that some had large differences in fluency scores between fast and slow speech, while others had more similar fluency scores in both rate conditions.

Figure 3 shows the mean fluency score per condition for each of the forty-eight listeners. Here, each panel shows the fluency scores given by a specific listener on the whole of the experiment, plotted for each delay step and both speech rates. The plot shows that, on the whole, most listeners judged most speech to be fluent (high scores on the scale). Furthermore, the plot shows that some listeners very consistently gave similar fluency ratings to fast and slow speech, while others showed a clear effect of rate, and judged fast speech to be more fluent than slow speech.

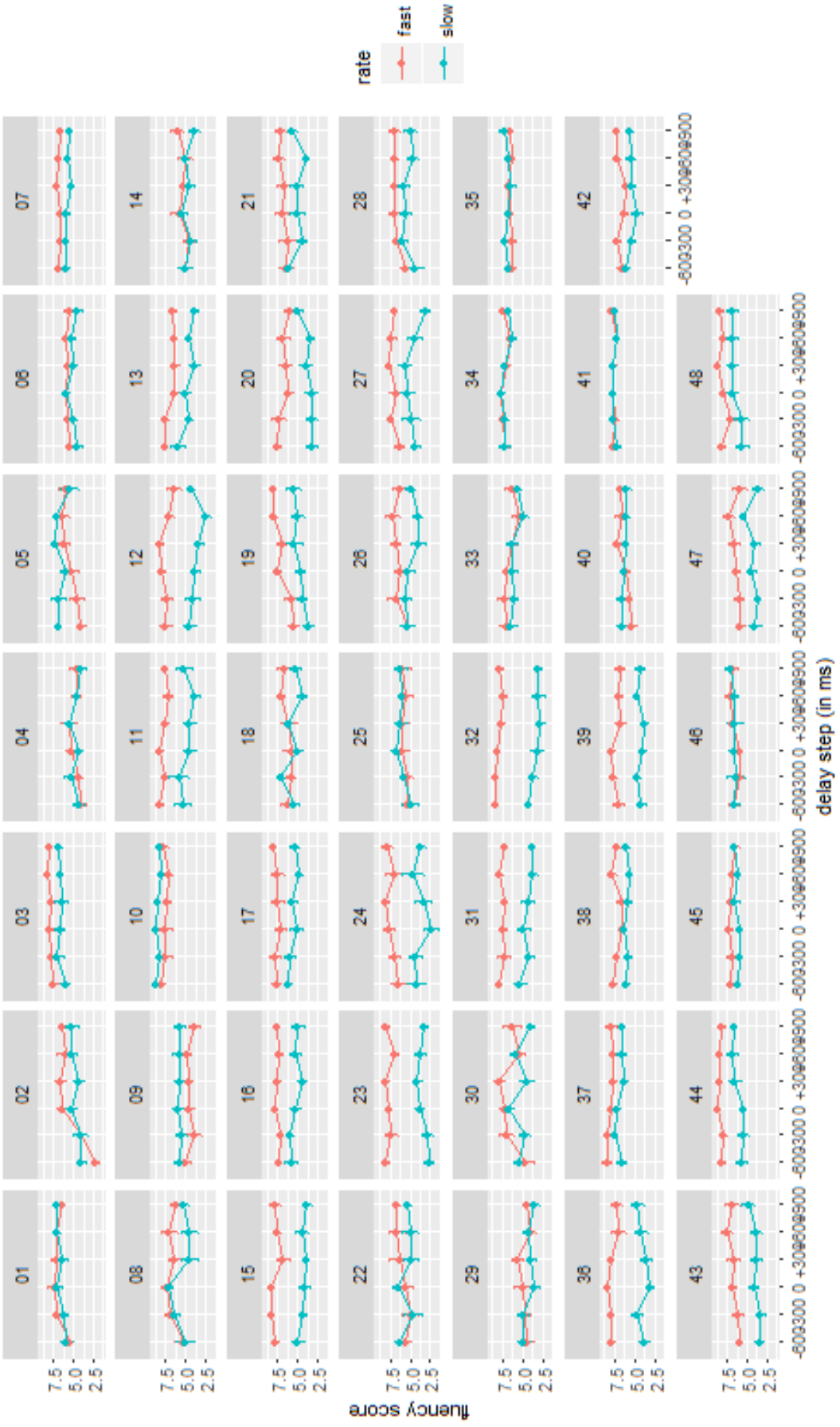

Figure 3 Mean fluency ratings for each condition per listener. Error bars show standard error.

4. Discussion

4.1 Summary of the present study

The present study investigated what factors contribute to fluency perception in dialogue, and specifically what the effect is of gaps and overlaps between question and answer turns in a dialogue between native speakers of Dutch. In order to test this, an experiment was set up. Recordings were made of questions and answers spoken by ten different native speakers of Dutch, and the questions and answers were concatenated with various delay steps, namely overlaps (-600 ms and -300 ms) or gaps (0 ms, +300 ms, +600 ms, and +900 ms) between the turns. Additionally, speech rate was manipulated to be fast or slow, resulting in twelve unique conditions. Participants listened to the fragments and rated the fluency of the answer on a nine-point scale, ranging from 'not fluent at all' to 'very fluent'. They were instructed to make their judgements based on the narrow definition of fluency and to pay attention to pauses, speech rate, and repairs and hesitations.

4.2 Speech rate

It was expected that an effect of speech rate would be found, where fast recordings would be rated as more fluent than slow recordings, thus replicating the results found by Bosker et al. (2013). This hypothesis was confirmed, as the present study indeed showed that fast fragments were rated as more fluent than slow fragments. These findings indicate that the experiment was measuring fluency in a way it was intended. Overall, the difference between fast and slow fragments was 1.45 on the nine-point scale. This suggests that speech rate is an important factor in determining fluency, both for non-native speech (Bosker et al., 2013) and for native speech as the present study shows.

About half of the participants commented in the post-experimental questionnaire that they noticed the speech rate manipulation. This is a larger number than Bosker et al. (2013) reported. A possible explanation for this is that in the present study native speech was manipulated to be slower or faster than the normal speech rate, while in Bosker et al (2013) native speech was slowed down to match the non-native speech rate, and non-native speech sped up to match the original native speech rate. As such, native speech was never actually sped up, as it was in the present study. Thus, the fast speech in the present study was faster than usual native speech, while the slow speech matched a typical non-native speech rate. This could have

led to more people noticing the speech rate manipulation. In fact, about a quarter of the participants commented specifically that only the fast fragments sounded unnatural, and that the slow fragments sounded natural.

Additionally, Bosker et al. (2013) manipulated exceptionally slow native speech fragments and exceptionally fast non-native speech fragments in such a way that they matched the slowest non-native speech fragment or the fastest native speech fragment respectively. No such normalization was done in the present study, which therefore had more variation. This may have led to larger variation in the fluency scores given to specific speakers, as also suggested by the exploratory analysis of mean fluency scores per speaker (see below).

Of course, one possible alternative explanation for the observed difference between fast and slow speech fragments, rather than speech rate being an important factor in (native) fluency, is the way participants were instructed to judge fluency in the experiment. They were explicitly instructed to judge fluency based on, among other factors, speech rate. It could be argued that these instructions caused the found effect of speech rate, rather than fluency judgements in itself. However, importantly, the instructions did not give any directionality (e.g. 'fast speech is more fluent than slow speech'), but only stated that judgements should be made based on speech rate, which could vary from very fast to very slow. Thus, the present results suggest that participants were paying attention to the task and following instructions. Additionally, the results suggest that a fast speech rate is in fact an important characteristic of fluent speech, as listeners were not told *how* to rate fast speech compared to slow speech.

4.3 Delay step

With regards to delay step, it was expected that the lowest fluency ratings would be found for the largest gaps between the question and answer, as this would signal that the speaker had trouble formulating the answer. Higher fluency ratings were expected for the condition with 0 ms overlap as no-gap-no-overlap turn-taking management strategies are preferred cross-linguistically (Stivers et al., 2009). The highest fluency ratings were expected for conditions with overlap as here the speaker is quickly ready to start speaking. No specific interaction effects were expected.

These hypotheses were partially confirmed by the results. In the slow speech rate condition it was indeed found that overlap was rated as more fluent than conditions with a gap. However, for the fast condition, the opposite pattern was found: Here fluency scores were

higher in conditions with a gap than in conditions with overlap. In both the fast and the slow condition, the change in scores happened at the gap of 0 ms. In the fast condition, the delay steps of -600 ms and -300 ms are rated with lower scores than the delay steps of 0 ms, +300 ms, +600 ms, and +900 ms. In the slow condition, the delay steps of -600 ms, -300 ms, and 0 ms are rated with higher scores than the delay steps of +300 ms, +600 ms, and +900 ms. In both conditions, as well as overall, the condition with 0 ms overlap has the highest fluency scores, suggesting that our participants did prefer the no-gap-no-overlap strategy and rated these fragments as more fluent than those with either a gap or with overlap.

The interaction that was found between speech rate and delay step shows that the various delay steps, either gap or overlap, have a different effect on fluency ratings for either fast or slow speech. While for fast speech, overlaps in turns lead to lower fluency ratings than gaps, this is the opposite in slow speech. In slow speech, larger gaps lead to lower fluency ratings than overlaps.

It could be the case that this interaction was found because participants interpreted the length of the gap relative to the speed of the answer. A segment of a certain length in fast speech sounds longer than the same segment in slow speech as it is interpreted relative to the speech rate it is embedded in (Reinisch & Sjerps, 2013; Summerfield, 1981). In the present experiment, this would mean that the overlap between question and answer in slow speech sounded shorter and thus more fluent than the overlap in fast speech. However, this does not explain why the large gaps are rated as less fluent in the slow condition compared to overlap as the gaps would be interpreted as relatively short, thus confirming to the no-gap-no-overlap standard. It also does not explain why the fast gaps were rated as more fluent as these would sound relatively long and thus less fluent.

Another possibility is that listeners combine cues from both speech rate and delay step to make their judgement. As listeners made their judgements only after hearing the entire speech fragment, they would take into account all acoustic cues available to them. Fast speech in itself is fluent, and larger gaps do not affect this fluency. However, overlap does, as the speaker then might sound too eager and not synchronized with the interlocutor, making the turn less fluent. Additionally, in the fast speech condition there was relatively more overlapping speech than in the slow condition, as speech was faster but the same absolute time of overlap was used. This might also have affected fluency ratings in the fast speech overlap condition. Slow speech in itself is less fluent, but in case of overlap rated more fluent as this shows that the speaker does not have trouble constructing their utterance. Larger gaps do affect fluency ratings in a negative

way for slow speech as these show that the slow speaker also needs more time to construct their response, leading to lower fluency ratings. Thus, listeners seem to take into account both the effects of speech rate on fluency and the effects of gaps or overlap on fluency and combine these two inferences to make their overall fluency judgement for the speaker. Here it seems that the extremes are rated as less fluent: Fast speech in itself is fluent, but with overlap it is *too fast* and becomes less fluent, slow speech in itself is fluent, but with gaps it is *too slow* and rates as less fluent.

4.4 Exploratory analyses

Some exploratory analyses were carried out to investigate trends with regards to speakers and listeners. These results are presented in Figure 2 and Figure 3, respectively.

Inspecting Figure 2 shows that for most speakers fast speech is rated as consistently more fluent than slow speech. However, some speakers, notably Speaker 3, Speaker 7, and Speaker 10, do not show such a consistent difference in fluency scores between the two speech rate conditions. Speaker 1 has received relatively low fluency scores in both the fast and slow condition, while for example Speaker 8 and Speaker 9 are rated relatively fluent in both conditions. This shows the large variability within speakers with regards to fluency, even though all are native speakers.

Turning to Figure 3, this can give more insight in what strategies listeners used to rate fluency. A few participants (such as Listener 5, Listener 9, and Listener 10) seem to have rated slow speech as more fluent than fast speech, thus going against the average direction. Two of these participants explicitly noted in the post-experimental questionnaire that only the fast fragments sounded unnatural. However, so did several other listeners (for example Listener 16, Listener 31, and Listener 44), who did rate fast speech as more fluent than slow speech. As such, naturalness does not seem to be a consistent factor for all participants to base their judgements on. Interestingly, some participants (Listener 25, Listener 34, and Listener 41, among others) show no difference between the fast and slow speech rate conditions, suggesting that they did not use this feature to base their fluency judgements on. Other listeners (for example Listener 12, Listener 23, and Listener 36) show a clear difference between fast and slow speech, and rated slow speech as less fluent than fast speech, suggesting that they have used speech rate as an important factor in their fluency judgements. Taking a closer look at Listener 8, we see that their judgements show an interaction between speech rate and delay step:

In the overlap conditions fast and slow speech are judged to be equally fluent, while in the gap conditions slow speech is judged to be less fluent than fast speech.

4.5 Implications and further research

Results from the present study show that turn-taking behaviour in a dialogue affects fluency ratings for the speaker. Overlap leads to higher fluency ratings in slow speech, but to lower fluency ratings in fast speech. Gaps between question and answer turns lead to lower fluency ratings in slow speech, but to higher fluency ratings in slow speech.

As previous studies have found that native and non-native speech are judged on similar factors when it comes to fluency (Bosker et al., 2014; Kahng, 2014; 2018), we assume that the findings from the present study can be generalized to non-native speakers as well. Therefore, these results can be of interest to the language testing practice. The present study shows that the current practices in language testing do not completely reflect reality. In language testing, fluency is assessed in monologues and according to the narrow definition, while in reality speech occurs in dialogues where speakers are at least partially judged on turn taking behaviour. Thus, while some language tests assess a learner to be fluent based on monologue tasks, this speaker might, for example, leave long gaps before answering questions in a dialogue, and thus be rated as less fluent in everyday communication. While the present study only showed a small effect and weak interaction, it suggests nonetheless that the language testing practice should implement some changes with regards to fluency assessments to better capture fluency in everyday communication.

All delay steps used in the present experiment are reported to occur in natural Dutch conversation, though the extremes (-600 ms and +900 ms) occur only rarely (Stivers et al., 2009). As such, the stimuli in the present experiment reflect natural behaviour in dialogues. Stivers et al. (2009) showed that disconfirmative answers and nonanswers are prefaced by longer gaps than confirmation responses. While most questions in this experiment were open questions, some were closed and paired with non-preferred answers. For these items, longer gaps might sound more natural and therefore more fluent. This might have led to variation between question-answer pairs that was not controlled in the present study. Additionally, in the present study within-speaker variation with regards to speech rate and fluency was not controlled. Future studies could implement a more controlled design. The design could be

expanded with other delay steps, spanning a different or larger range or using different steps than the 300 ms steps in the present study.

The present study investigated the effect of speech rate and various delay steps on fluency ratings in native speech. An interesting point for future research is to investigate the effect of speech rate and various delay steps on *non-native* speech, and compare these findings to those for native speech. These results would give more insight in how dialogue settings affect perceived fluency in non-native speakers. As Stivers et al. (2009) found slight differences in the distribution of turn transitions in milliseconds across languages, it would be interesting to see whether these differences are also reflected in the fluency ratings listeners of a specific language give (native or non-native) speakers of that language.

In conclusion, the present study investigated the effect of speech rate (fast or slow), and delay between question and answer (various gaps and overlaps) in a dialogue setting on fluency ratings for the speaker of the answer. Participants listened to short dialogues and were instructed to rate the fluency of the speaker giving the answer on a nine-point scale. Results showed that fast speech was rated as more fluent than slow speech, and additionally showed an interaction effect of speech rate and delay step. In fast speech, overlap was rated as less fluent than gaps, while in slow speech overlap was rated as more fluent than gaps. Suggestions for future research include a similar experiment carried out with non-native speech. The findings from the present study carry implications for language testing, as results show that larger gaps are not necessarily associated with lower fluency.

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Appendix

Overview of all questions and answers that were recorded in the experiment, as well as the syllable count of the answer.

Question	Answer	Syllables
Heb je ooit huisdieren gehad, eigenlijk?	Ja, ik heb een kat die Snuf heet, en twee goudvissen. Zij heten Elvis en Nemo.	21
Heb je ooit huisdieren gehad, eigenlijk?	Ik ben veel van huis voor mijn werk, dus heb geen huisdieren. Ze zouden dan teveel alleen zijn en dat wil ik niet.	28
Heb je een sport die je graag doet?	Nu niet meer, maar vroeger wel. Ik heb bijna tien jaar aan atletiek gedaan.	19
Heb je een sport die je graag doet?	Ik ga graag een stukje hardlopen, of squash spelen met een vriend. Dat is alleen lastig te plannen, want we hebben het beide erg druk.	34
Heb je al een vakantie voor de zomer geboekt?	Niet voor de zomer, maar ik ga in het najaar een rondreis van drie weken maken door Spanje.	24
Heb je al een vakantie voor de zomer geboekt?	Ik heb vorige week een vakantie geboekt naar Griekenland, een verblijf in een hotel bij het strand voor twee weken.	30
Wat wilde je worden toen je klein was?	Ik wilde toen ik klein was dierenverzorger worden, of dierenarts. Dat is het uiteindelijk niet geworden.	29
Wat wilde je worden toen je klein was?	Op deze vraag kan ik zoveel antwoorden geven! Astronaut, huisarts, leraar, bij de brandweer... Ik had elke maand een ander idee.	34
Hou je van koken, ben je er goed in?	Ik hou van koken, maar het moet niet te ingewikkeld zijn. Dan lukt het ook vaak wel goed.	22
Hou je van koken, ben je er goed in?	Zo lang ik een recept kan volgen, kan ik prima koken. Improviseren is niet mijn sterkste kant, dan mislukt het gerecht vaak.	33
Hoe reis je naar je werk, normaal gesproken?	Ik neem eigenlijk altijd de fiets om op mijn werk te komen, behalve als het regent. Dan ga ik met de bus.	29
Hoe reis je naar je werk, normaal gesproken?	Ik ga altijd met de auto. Ik woon vrij ver van mijn werk en het is voor mij niet handig om de trein te nemen.	29
Wat was je favoriete vak op de middelbare school?	Ik vond geschiedenis het leukst. Dat kwam ook door mijn leraar, hij kon ontzettend goed vertellen.	24
Wat was je favoriete vak op de middelbare school?	Scheikunde was mijn lievelingsvak. Ik vond het altijd zo leuk om de proefjes te doen en te zien wat er gebeurt.	29
Wat is je favoriete film, als je ééntje moet kiezen?	Ik moet toegeven dat mijn lievelingsfilm nog altijd de Titanic is. Ik heb hem al heel vaak gezien.	27
Wat is je favoriete film, als je ééntje moet kiezen?	Ik hou erg van horrorfilms, maar mijn favoriet is toch The Shining. Eigenlijk helemaal niet zo eng, maar wel een echte klassieker.	34
Hou je van koffie of helemaal niet?	Ja, ik ben gek op koffie! Ik drink het het liefst met melk en twee klontjes suiker, maar als het echt moet ook wel zwart.	28
Hou je van koffie of helemaal niet?	Nee, ik hou echt niet van koffie. Je maakt me wel blij met thee, ik lust echt alle soorten en smaken.	25
Tot hoe laat kun je mij helpen met verhuizen vandaag?	Ik moet uiterlijk om kwart over drie weg, zodat ik nog mijn trein kan halen.	19

Tot hoe laat kun je mij helpen met verhuizen vandaag?	Niet te lang, helaas, ik moet morgenochtend vroeg bij een afspraak zijn. Maar ik kan in ieder geval de hele middag blijven.	32
Weet jij wat voor weer het wordt deze week?	Ik geloof dat het vandaag droog blijft, maar morgen gaat het de hele dag regenen.	21
Weet jij wat voor weer het wordt deze week?	Deze week blijft het lekker warm en zonnig, maar na het weekend gaat het hard waaien en komt er regen aan.	26
Heb je al weekendplannen kunnen maken?	Zaterdagavond ga ik naar de film met vrienden, en zondag komen mijn ouders op bezoek.	24
Heb je al weekendplannen kunnen maken?	Het schijnt droog te blijven, en het wordt echt eens tijd om gras te maaien, dus dat staat op de agenda. En verder gewoon genieten van het mooie weer.	38
Ben je wel eens naar de Verenigde Staten op reis geweest?	Nee, nog nooit. Maar ik zou ontzettend graag een lange reis ernaartoe maken. Er is zoveel te zien en te doen!	28
Ben je wel eens naar de Verenigde Staten op reis geweest?	Ik ben vorig jaar een weekje naar New York geweest, maar ik zou graag nog eens terug gaan, en ook andere delen van het land zien.	32
Hoeveel tv kijk je normaal gesproken?	Ik kijk vaak 's avonds tv. Dan kijk ik het journaal en blijf ik hangen bij allerlei programma's. In het weekend zet ik zelf ook wel eens een film op.	38
Hoeveel tv kijk je normaal gesproken?	Niet zoveel. 's Ochtends kijk ik het nieuws tijdens het ontbijt, en verder af een toe een programma als het interessant is. Dat is het wel.	35
Ben je handig met computers of moet je altijd hulp inschakelen?	Ik kan mijn weg vinden op de computer en doen wat ik moet doen, maar je moet me absoluut niet vragen om iets te programmeren ofzo.	36
Ben je handig met computers of moet je altijd hulp inschakelen?	Ik werk veel met computers en kan de meeste problemen zelf gemakkelijk oplossen. Mijn ouders bellen me altijd als er iets met hun computer aan de hand is.	43
Ben je een ochtendmens of een avondmens?	Ik ben helemaal geen ochtendmens. Het liefst zou ik iedere dag tot twaalf uur in bed blijven liggen. 's Avonds ben ik echt productief.	34
Ben je een ochtendmens of een avondmens?	Ik heb er geen probleem mee 's ochtends vroeg op te staan, en na een kopje koffie ben ik gelijk wakker, maar af en toe uitslapen is zeker geen straf.	38
Kom je uit een grote familie of juist een kleine?	Zelf heb ik een oudere zus. Mijn ouders komen beiden uit een groot gezin, dus ik heb een heleboel neven en nichten.	32
Kom je uit een grote familie of juist een kleine?	Mijn familie is klein, maar erg hecht. We zien elkaar vaak en vieren feestdagen samen. Eén keer in het jaar gaan we met z'n allen een weekendje weg.	38
Wat voor werk doe je in je dagelijks leven?	Ik werk als project coordinator bij een bedrijf dat uitwisselingen regelt tussen scholen in Nederland en de Verenigde Staten.	38
Wat voor werk doe je in je dagelijks leven?	Ik werk bij een reisbureau. Vaak op kantoor, maar soms val ik in als reisleider bij een van onze tours, dat is altijd een leuke afwisseling.	37
Welk eten eet je het liefst en is echt je favoriet?	Mijn moeders kippensoep is mijn favoriet. Ze heeft me het recept gegeven, maar als ik het zelf maak smaakt het nooit helemaal hetzelfde.	35
Welk eten eet je het liefst en is echt je favoriet?	Ik ben gek op de Indonesische keuken. Mijn oma kwam uit Indonesië, en ze maakte altijd de lekkerste gerechten als we op bezoek kwamen.	42

Wat vindt je leuk om in je vrije tijd zoal te doen?	Als het goed weer is, ga ik graag een stuk fietsen of hardlopen. Als het regent kruip ik op de bank met een goed boek.	29
Wat vindt je leuk om in je vrije tijd zoal te doen?	Ik hou van muziek en speel zelf gitaar. Verder vind ik het in de zomer heerlijk om door de stad te slenteren of een terrasje te pakken.	37
Wat is het beste concert dat je ooit hebt bezocht?	Ik ben met vrienden naar Ed Sheeran geweest, dat was heel gaaf. Het is zo indrukwekkend hoe hij in zijn eentje alle muziek inspeelt.	34
Wat is het beste concert dat je ooit hebt bezocht?	Het is niet echt een concert, maar een festival. Een paar jaar geleden ben ik naar Pinkpop geweest, en dat was echt geweldig.	32
Heb je een favoriet museum dat je vaak bezoekt?	Mijn favoriete museum is het Louvre in Parijs. Ik raak daar nooit uitgekeken. Ik ben er al vijf keer geweest en ik denk dat ik nog steeds niet alles heb gezien!	43
Heb je een favoriet museum dat je vaak bezoekt?	Ik bezoek graag het Rijksmuseum. Ik kan uren naar alle schilderijen kijken, en dan zijn er ook nog de wisselende tentoonstellingen.	38
Heb je groene vingers of juist helemaal niet?	Helaas niet. Ik zou heel graag zelf groente verbouwen, maar een simpele vetplant laat ik al doodgaan, dus ik probeer het maar niet.	32
Heb je groene vingers of juist helemaal niet?	Ja, ik denk het wel. Ik heb dan wel geen tuin, maar de kamerplanten staan er altijd mooi bij en gaan eigenlijk nooit dood.	29
Heb je wel eens een bot gebroken of nog nooit?	Toen ik zeven jaar oud was, dacht ik dat ik op een skippybal zou kunnen staan. Dat bleek een slecht idee, en ik brak mijn arm toen ik viel.	33
Heb je wel eens een bot gebroken of nog nooit?	Nee, nog nooit. Ik heb veel geluk gehad, denk ik. Ik heb wel eens mijn enkel zwaar gekneusd, dat was al erg pijnlijk.	28
Van welk jaargetijde hou je het meest en waarom?	Mijn favoriete jaargetijde is de winter. Ik vind de kou heerlijk, en met wat geluk kunnen we schaatsen op natuurijs!	32
Van welk jaargetijde hou je het meest en waarom?	Ik hou het meest van de lente. Dan worden de dagen weer langer na de donkere winter en begint alles weer te groeien en te bloeien. Heerlijk!	39
Hoe heb je je verjaardag gevierd de laatste jaren?	Ik ben midden in de zomer jarig, dus vaak kan ik lekker met de visite in de tuin zitten. Helaas zijn veel vrienden vaak op vakantie rond mijn verjaardag.	42
Hoe heb je je verjaardag gevierd de laatste jaren?	Mijn vader is een week later jarig dan ik, en meestal gaan we met het gezin uit eten om beide verjaardagen te vieren. Het is een soort traditie geworden.	44
Ben je goed in talen leren, heb je een talenknobbel?	Ik spreek redelijk goed Engels, maar daar houdt het wel op. Op school heb ik Frans en Duits zo snel mogelijk laten vallen, ik heb echt geen talenknobbel.	39
Ben je goed in talen leren, heb je een talenknobbel?	Ja, best wel. Ik vind het in ieder geval erg leuk om nieuwe talen te leren. Ik wil heel graag Chinees leren. Ik ben al op zoek naar een cursus.	38
Een favoriete dag van het jaar, heb je die toevallig?	Mijn favoriete dag? Ik zou het echt niet weten! Het hangt er heel erg vanaf wat er gebeurt... Ik kan echt niet één favoriete dag kiezen.	36
Een favoriete dag van het jaar, heb je die toevallig?	Ik hou het meest van Kerst, ookal zijn dat eigenlijk twee dagen. Ik hou van de kerstsfeer en kerstmuziek, en dan gezellig met de hele familie kerst vieren!	41

Wat zou je absoluut niet nog eens doen van alle dingen die je ooit hebt gedaan?	Ik ben begonnen aan een studie rechten, maar dat was echt helemaal niets voor mij. Rechten studeren is dus zeker iets dat ik niet nog eens zou doen.	38
Wat zou je absoluut niet nog eens doen van alle dingen die je ooit hebt gedaan?	Vrienden hebben me vorig jaar overtuigd om mee te gaan bungee jumpen. Het was echt verschrikkelijk eng, en ik was blij toen ik weer op de grond stond.	37
Als je strandt op een onbewoond eiland, welke drie dingen zou je mee willen nemen?	Oh, over deze vraag heb ik al eens nagedacht. Ik zou een satelliettelefoon meenemen, een waterfilter, en een surfplank. Ik word toch snel gered!	40
Als je strandt op een onbewoond eiland, welke drie dingen zou je mee willen nemen?	Ik zou een tent meenemen, een survivalhandboek, en misschien vuurpijlen om een hulpsignaal af te geven.	28
Waar zou je liever wonen, een grote stad of juist een heel klein dorpje?	Ik zou het liefst in een grote stad willen wonen. Ik hou van de drukte om me heen, en dan is er altijd iets te doen	31
Waar zou je liever wonen, een grote stad of juist een heel klein dorpje?	Iets ertussenin, denk ik, een stad is me te druk, maar het moet ook geen dorpje zijn van drie straten, dat is weer te klein.	30
Welke superkracht zou je willen hebben als je kon kiezen?	Ik zou de tijd willen kunnen manipuleren. Dan kan ik de saaie treinreis van en naar mijn werk doorspoelen, en het weekend wat langer maken.	38
Welke superkracht zou je willen hebben als je kon kiezen?	Ik zou willen kunnen teleporteren. Even snel een uurtje naar een tropisch eiland, of even snel terug naar huis als ik iets vergeten ben. Lekker handig!	42
Een favoriete dag van de week, heb je die?	Mijn favoriete dag is de maandag. Ik hou ervan om weer van start te gaan met de week. Bovendien heb ik maandag dansles waar ik altijd erg blij van word.	40
Een favoriete dag van de week, heb je die?	Ik heb er nooit echt over nagedacht, maar ik denk dat vrijdag mijn lievelingsdag is. Lekker het werk van de week afronden en dan is het weekend.	37
Wat is het eerste baantje dat je ooit hebt gehad?	Toen ik veertien was, had ik een krantenwijk. Ik vond het echt verschrikkelijk om elke ochtend vroeg op te staan, vooral als het regende. Ik ben snel gestopt.	39
Wat is het eerste baantje dat je ooit hebt gehad?	Mijn eerste baantje was als vakkenvuller bij een supermarkt. Ik vond het heel leuk om te doen, het team was gezellig en ik heb veel vrienden gemaakt.	38
Wat is het mooiste cadeau dat je ooit hebt gekregen van iemand?	Een paar jaar geleden namen vrienden me voor mijn verjaardag mee op een stedentrip naar Kopenhagen. Dat was echt een hele leuke verrassing!	38
Wat is het mooiste cadeau dat je ooit hebt gekregen van iemand?	Op mijn achttiende verjaardag gaven mijn ouders me een ketting die van mijn oma is geweest, en die heeft veel emotionele waarde.	37
Als je kon tijdreizen, wat zou je dan willen doen?	Als ik kon tijdreizen zou ik naar de toekomst gaan. Ik ben zo benieuwd hoe de wereld eruit ziet over honderd of tweehonderd jaar!	33
Als je kon tijdreizen, wat zou je dan willen doen?	Ik zou naar allerlei belangrijke gebeurtenissen in het verleden reizen, om te zien hoe het er echt aan toe ging, en om er zelf bij geweest te zijn.	41
Als je de loterij zou winnen, wat zou je dan met al het geld gaan doen?	Ik ben nu al een tijdje op zoek naar een nieuw huis, dus ik zou het geld gebruiken om echt mijn droomhuis te kopen.	29

Als je de loterij zou winnen, wat zou je dan met al het geld gaan doen?	Als ik de loterij zou winnen, zou ik eerst mijn studieschuld afbetalen, een deel aan een goed doel geven, en dan eens lekker op vakantie!	37
Heb je een verzameling van het een of ander?	Nee, niet meer. Toen ik klein was, had ik een grote verzameling sleutelhangers. Ik kocht ze op elke vakantie.	29
Heb je een verzameling van het een of ander?	Ik heb plakboeken vol gedroogde bloemen. Ik begon die verzameling samen met mijn oma, en voeg nu af en toe zelf nieuwe toe.	35
Hou je ervan om naar het strand te gaan voor een dagje uit?	Ik vind het heerlijk om de zomer naar het strand te gaan als het warm is. Lekker zonnebaden en af en toe afkoelen in zee!	33
Hou je ervan om naar het strand te gaan voor een dagje uit?	Ik heb een hekel aan het zand dat overal in komt, dus ik ga niet zo graag naar het strand. Een korte strandwandeling gaat nog wel.	33
Ben je bijgelovig, of helemaal niet misschien?	Ik ben een beetje bijgelovig. Ik pas op met dingen zeggen als 'Het regent nu niet', want het is te vaak gebeurd dat het dan spontaan begon te regenen.	41
Ben je bijgelovig, of helemaal niet misschien?	Nee, dat ben ik totaal niet. Ik schrik niet van zwarte katten, en loop gerust onder een ladder door. Ik geloof niet dat ik dan een ongeluk krijg.	37