The Effect of Recreational Video Watching on Adult Dutch Learners: An In-situ DELFTSE METHODE Classroom Observation

Xiaotong Shang

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Media Technology MSc program, Leiden University
Supervisor: Crit Cremers and Enrico Odelli
shangxiaotong@gmail.com

Abstract—Second language (L2) acquisition has become a popular and important topic nowadays because of the rapid globalization. This study focuses on Dutch learning for adults, since there is a large number of immigrants and international students coming into the Netherlands every year. This population normally needs to acquire Dutch in a relatively short term. Given the situation of this population, there is a need for a self-reliant and easily held way for them to get use to the language environment. Motivated by this need, this study inspect into the impact of recreational video watching. Another drive is that watching recreational video is a popular but unevidenced method of self-studying of a foreign language. With this purpose, based on Krashen's Affective Filter Theory, this study takes the Foreign Language Anxiety and the Utterance Fluency as the measurements for the impact, and a non-laboratorial observational controlled experiment was conducted with the 14 participants who were attending "Nederlands voor Buitenlanders, de Delftse Methode" course in Delft University of Technology. The participants were divided into a experiment group and the a group, both having 7 people. The experiment time span is four weeks. During these four weeks, the experiment group participants would watch recreational videos in Dutch with captions every week, whereas the control group participants were asked to avoid watching recreational video in Dutch. Questionnaires for assessing the Language Anxiety were handed out before and after the experiment to all the participants to evaluate the change of it during the four weeks, and eight real classroom recordings were acquired during the eight class sessions of the four weeks. In this way the impact of recreational video watching in Dutch on the Language Anxiety and Utterance Fluency was evaluated. The results show that there is a meaningful reduction in the experiment group's Language Anxiety where as there is no meaningful reduction in the control group's Language Anxiety. Moreover, the experiment group was making a more rapid progress on the Utterance Fluency during the eight class sessions than the control group. Thus the conclusion can be drawn that the recreational video watching has helped with reducing the Language Anxiety and promoting the Utterance Fluency, and this self-teaching or exercise method is recommendable. However, further research is needed to reach a more generally applicable conclusion.

I. INTRODUCTION

The number of immigrants coming into the Netherlands has increased sharply since 1995 [1]. According to the estimation of Statistics Netherlands, until 2014 August, 440 immigrants are registered in the Netherlands every day on average [31], which is a rather noticeable number compare to the number of newborns every day, which is 470 on average. According to the Dutch government, there are three ways to meet the civic integration requirement: to pass the civic integration exam (inburgeringstoets) within three years, to pass the state examinations in Dutch as a L2 (NT2), or to take a course of vocational or professional education. In any case, immigrants have to show their fluency in Dutch language. Also, more than one fifth of students in higher education in 2007 have a foreign background, and it is still a growing number [2]. Most of these immigrants and international students come to the Netherlands with English as their main communication tool, but there is a need of acquiring Dutch for this population within a relatively short period for an academic purpose or for the residence purpose.

On a larger scope; with the progress of globalization, international business and knowledge exchange, overseas studying, and migration have been making foreign language acquisition an increasingly popular and important topic. Various foreign language teaching and self-teaching methods have been springing up to suit for different needs. For example, employing creative materials like multi-media, and integrating all kinds of technologies such as the Language Laboratory (LL). For decades, trails, experiments and studies of new practices have been carried out in scientific, commercial, informal and even grass-root manners. This is especially common in Asia. For example, in China, learning English by watching American or British TV series and movies is a rather popular self-teaching method and is still attracting more and more attention and practice. There are an overwhelming number of forums, tutorials, software applications, and even courses to provide guidance for it. However, whether this TV

watching frenzy is reasonable regarding foreign language learning, remains open to discussion. For example, it has been suggested that the difficulty of using television as an educational resource lies "*in the leisure mental sets of viewers towards television watching*" [16]. This theory asserts that the viewers' casual and relaxed mental state hinders the TV watching of helping with language learning, which also calls for evidence.

Given this situation, this study is devoted to the possibility for Dutch learners to use entertaining video materials to help themselves to reduce their negative affection and build up their confidence with using the language, and to prompt the language internalization process. So the research experiment strives to simulate an entertaining video watching experience that the learner is likely to have in real life and to inspect the effects on these learners.

The purpose is to try to find a method for the adult Dutch learners to help themselves in a way that is easy to keep up to and possibly life-long so that they can keep their language updated in this dynamic era. Thus this study takes from the language learners' instead of instructors' or educators' perspective, and the reason of this is that, like mentioned by the founder of DE DELFTSE METHODE, Sciarone, "*Leren doen mensen zelf. Onderwijs is slechts hulpmiddel.*" [17] (People learn by themselves. Education is only a help.)

Note that when discussing the effect or difference potentially made by the recreational video watching, evaluating the change in the real knowledge or mastery of Dutch for the participants is not part of the purpose of this study, and the reason for this will be further explained in the *Second Language Fluency* section below.

A. Research Background and Context

  1) Foreign Language Anxiety

    a) Definition

According to the scale given by Spielberger, Gorsuch, and Lushene in the 1970, anxiety in general consists of two components or dimensions: state anxiety, "*consisting of subjective feelings of tension, apprehension, nervousness and worry, with associated arousal of the autonomic nervous system*", and trait anxiety, "*stable individual differences in anxiety proneness in situations perceived as dangerous and threatening*" [32][33][39]. In 1980s, Elaine K. Horwitz, Michael B. Horwitz, and Joann Cope have defined foreign language anxiety as "*a distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process.*" [34] It is a specific anxiety reaction that results in symptoms such as:

- Negative affections: "*apprehension, worry, even dread*";
- Difficulties in concentrating, remembering, etc.;
- Avoidance behaviors: skipping classes, postponing homework, aversion of making mistakes or guesses;
- Careless errors or forgetting what is known in tests;
- Over-studying.

Regarding both the academic and the social context, it has been specified with three components:

- Communication apprehension, "*a type of shyness characterized as fear of, or anxiety about communicating with people*";
- Test anxiety, "*the type of performance anxiety resulting from a fear of failure in an academic evaluation setting*";
- Fear of negative evaluation, "*apprehension about others' evaluations, and avoidance of evaluative situations*".

Beyond the three components, Language Anxiety is a "*distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning*". [35]

A summary of the development with 44 milestones on the subject of Language Anxiety can be found in Elaine K. Horwitz's paper in 2010, FOREIGN AND SECOND LANGUAGE ANXIETY, where she summarizes that in the early phase, the researches mainly "*address the nature of Language Anxiety as contrasted with or related to other anxiety types and the effects of Language Anxiety especially on language achievement*", and later it mainly focuses on "*sources of Language Anxiety and its stability or variation under different instructional or socio-cultural conditions, the relationship of Language Anxiety with other learner factors, anxieties in response to specific aspects of language learning such as listening, reading, or writing, and instructional strategies to reduce Language Anxiety*"[36].

  b) Significance

"*Research on the affective domain of second language acquisition and learning has been accumulating steadily for a number of years.*" [37], and "*research in this field has asserted that language anxiety is the most powerful predictor on the students' performance among the affective factors*" [38] [40]. One reason of this might lie in the relation to Stephen Krashen's famous Affective Filter Theory. It is mentioned in Horwitz et al's original paper, FOREIGN LANGUAGE CLASSROOM ANXIETY, that "*anxiety contributes to an affective filter, according to Krashen, which makes the individual unreceptive to language input ; thus the learner fails to "take in" the available target language message and language acquisition does not progress.*" [41] More detailed explanations about the Affective Filter Theory and its relevance will be found in the later part of this paper.

Overall, there is a "*consistent and reasonable*"[42] negative influence of Foreign Language Anxiety on language learners' achievement or performance proven by plenty of research. This negative influence was disputable given that there were studies that deemed that the poor target language performance was the cause rather than result of the Language Anxiety, or that under some circumstances the Foreign Language Anxiety could have positive influence on the corresponding language performance, until Elaine K. Horwitz clarified the relationship between Language Anxiety and the language performance in 2001. Based on the result of research of Horwitz [43], MacIntyre and Gardner [44], Aida [45], Rodriguez [46], etc., Elaine concludes that there indeed is a negative correlation between Language

Anxiety and the language achievement. However, there is a difference between the role of the anxiety in language performance and the role of the anxiety in language learning experience, which could be potentially more interesting to look into.

c) Causes and solutions

It is pointed out that "*second language communication entails risk taking*"[47] due to the person's uncertainty or even unawareness of the "*linguistic and socio-cultural standards*"[48], and "*because complex and non-spontaneous mental operations are required in order to communicate at all, any performance in the L2 is likely to challenge an individual's self-concept as a competent communicator and lead to reticence, self-consciousness, fear, or even panic*"[49], and Elaine later summarized this as "*anxiety stems from the inherent inauthenticity associated with immature second language communicative abilities*"[50].

The Language Anxiety could be addressed on both the teacher's and the student's side. Generally speaking, according to Horwitz et al., the teacher "*can help them learn to cope with the existing anxiety-provoking situation*" or "*make the learning context less stressful*", and a few specific techniques are given, such as "*relaxation exercises, advice on effective language learning strategies, behavioral contracting, and journal keeping*"[51]. However, until today there is no proven radical panacea for Language Anxiety.

2) Affective Filter Theory and de Delftse Methode

The Affective Filter theory is part of the Monitor Model, which is a group of five hypotheses of L2 acquisition developed by Stephen Krashen in the 1970s and 1980s [18] [19]. DE DELFTSE METHODE (*the Delft Method*) is originally a Dutch teaching method developed by A.G.Sciarone et al. and instructors of Delft University of Technology for the purpose of helping foreign students to quickly adjusting to the Dutch language and cultural environment in both academic and personal lives, and it is widely adopted in the Netherlands for Dutch teaching in various situations and to diverse audiences. The relationship between this theory and this method is that many ideas of DE DELFTSE METHODE are derived from the Monitor Model. This could be seen from the following comparison. Firstly, according to the Monitor Model, sufficient comprehensible input is a better method than explicit and pure grammatical instruction in terms of developing grammatical knowledge [20]. DE DELFTSE METHODE advocates explaining the grammar via the examples in the texts [21]. Secondly, the Input Hypothesis of the Monitor Model states the idea of "i+1", the "i" referring to the current level of the language input and the "1" referring to the step towards the higher level of input, meaning that the learners progress when they comprehend the language input that is slightly beyond their reach. Meanwhile DE DELFTSE METHODE tries to offer the maximum work load to the learners: always to make sure to saturate the capability of the learners [22]. Thirdly, DE DELFTSE METHOD*e* adopts the idea from the Monitor Model that the order of the instruction does not influence the order of language acquisition, i.e. no matter in what order the learners are taught of the language elements such as the grammar, they always acquire them in an order that is similar to the natural acquisition of the first language [23]. Moreover, the Monitor Hypothesis of the Monitor Model claims that conscious learning puts the learners under a Monitor of self-checking and self-correcting before and during an utterance, which makes them unable to speak spontaneously. According to Conny Wesdijk, one of the authors of DE DELFTSE METHODE textbook, the reason why they try to teach grammar via examples is to avoid the unnecessary checking before utterances. This is in line with the Monitor Hypothesis. Hence it is clear that there is a strong correlation between the Monitor Model and DE DELFTSE METHODE.

One important part of the Monitor Model, the Affective Filter theory, is one of the sources of or inspirations for the Language Anxiety. Thus this "*socio-affective filter*" also offers a possible explanation for the Language Anxiety [8]. According to the Affective Filter theory, certain negative affections function as a filter that prevents the language learners from comprehending and digesting the language input. There are two key factors to help lowering the Affective Filter: allowing a silent period for the learners to acquire adequate amount of input, and not correcting the errors too early. The idea of allowing a silent period is also the reason why this study has chosen watching videos as a focus. It does not impose the pressure of interaction and purely provides input. Also, this theory provides a reason for this study to suspect that given the entertaining nature, watching recreational Dutch TV programs might be able to help reducing the learners' anxiety about the language. This might enlarge the learners' acceptance of the language input. With this larger input to help coping with the silent period, the learners might be less hesitant during an utterance. Another hypothesis of the Monitor model, the Acquisition–learning hypothesis, states that there is a strict distinction between language acquisition and language learning. The former one is subconscious and natural, and the later one is conscious and painful, and only the former one is the decisive factor for improvement in the target language, which also backs up the hypothesis of this study that watching entertaining videos in a natural way could help the Dutch learners to make progress. Last but not the least, based on the Monitor Hypothesis, the hypothesis of this study is that the unconscious learning process offered by the recreational video watching could reduce the effect of the Monitor and thus make the utterance process more spontaneous. So the Monitor Model, and more specifically the Affective Filter Theory, is the conjunction of the critical elements of this study: Language Anxiety, DE DELFTSE METHODE, and the Utterance Fluency (see the *Second Language Fluency* section below).

3) Digital Media and Technology in Foreign Language Learning

Television, video, LL, multimedia, and digital technology, these terms are nothing new to the L2 acquisition research field. The excitement about the LL in the 1960s, about television and video in the 1980s, and the digital technology since the 1990s have induced lots of researches and discussions, and yet very little revolutionary or practical establishment has been yielded. The real start for the use of

television and digital technology is during the 1990s mainly because of the technology and internet advance. A well-rounded summary of the research activities since then up to 2010 is **DEJA VU? A DECADE OF RESEARCH ON LANGUAGE LABORATORIES, TELEVISION AND VIDEO IN LANGUAGE LEARNING** by Robert Vanderplank in 2010. It is mentioned in this review that excessive attention has been paid to following the latest technology and not enough to designing the methodology to use it to the full potential [25]. In practice, the simple, familiar and reliable technologies with a wide range of available materials were the most popular among teachers [26], and thus video and television materials were much more widely and frequently adopted than more advanced technology [27]. These findings support this current research to pay attention to the more basic and easily accessible media and technology, namely the public TV programs and movies online. Around the same time, a connectionist view shows that computers could help with the automatization of word-by-word understanding process, which is a critical factor for boosting L2 acquisition [28]. This is also a position that this current study takes. Plenty of studies and surveys have shown that aside from language instruction, multimedia technology (audio-visual essentially) also affords authentic cultural context, for both high culture and low culture. Even learners at a relatively low (intermediate) level could gain a significant amount of knowledge on both high culture and low culture without being overwhelmed [29]. Given these positive features of digital media, researches have been trying out specific methods to integrate them into the curriculum effectively. For example, an informative study in Hong Kong has shown that the use of film in an English as a Second Language environment yielded an improvement in their language skills, especially listening and speaking, and their confidence in using English. However, little has been done on the learners' side for them to do self-study or to have easy and enjoyable exercises outside the classroom as a supplement to the curriculum. This perspective is actually worth exploring because studies have shown that learners value the up-to-date authentic TV material as learning opportunities, and they enjoy the passive, informal, and basic learning experience of watching TV [30].

Overall, there are plenty of issues remaining to be further discussed. Such as training of the instructors, being mindful and selective with the technological sophistication, integrating technologies into the curriculum, the choice among active producing, interactive reacting and passive receiving, whether and how to use captions, the differences and similarities between children and adults learning from TV watching, material choosing regarding the genre, the language complexity, and the language style, and the starting level for video exposure, etc..

4) Second Language Fluency

Fluency is a common and all-encompassing word when talking about L2 ability. However, to measure, describe and represent the fluency of a L2 learner authentically, directly and unbiased, a definition of it is needed. In 1984, Brumfit C. J. summarized the characters of fluency as: "

- *'Filling time with talk', which implies automaticity of language processing;*
- *The production of coherent sentences using the 'semantic and syntactic resources of the language' appropriately;*
- *Selecting appropriate content for context;*
- *Being creative with the language."*[9]

Later the fluency research split up into "*two paths: the cognitive science route and the linguistic route*"[24]. This study follows the path of cognitive science, in which a milestone is the book **COGNITIVE BASES OF SECOND LANGUAGE FLUENCY**, written by Norman Segalowitz in 2010. It proposes three components of fluency: (a) cognitive fluency, "*ability of the L2 speaker to smoothly translate thoughts to L2 speech*" [53]; (b) utterance fluency, "*objective acoustic measures of an utterance*" [54]; and (c) perceived fluency, "*subjective measure of what listeners perceive about L2 speaker's cognitive fluency*" [52]. According to Segalowitz, cognitive fluency model can serve as a measure of "*general proficiency and L2 experience*" [55]. Thus the observable features of it, which could be measured with computer technology, can reflect the L2 proficiency [59]. Thus the script used in this study was developed by Nivja de Jong and Ton Wempe in 2007 to measure the Utterance Fluency, and a description about it can be found in the *Material* section of this paper. With this script, this study measures the 3 sub-categories of the Utterance Fluency: speed fluency, breakdown fluency, and repair fluency, and the basis of it is Judit Kormos' summary of the 10 measures of fluency that have been proposed in the literature (see TAB I.) [11][56][57].

The detailed analysis of the Utterance Fluency of the participants based on these measures can be found in the *Discussion* part of this paper.

However, one thing worth noticing is that fluency does not equal proficiency, efficiency or mastery. In the literature, fluency has been described as "*the movement-like or fluidity aspects of speech*" [60][61][62][63][64][65]. This is to say, fluency has little to do with the semantics aspect of the speech. For example, people who suffer from a speech disorder called Wernicke's Aphasia could talk perfectly fluently when their sentences don't make any sense at all. Thus the fluency being discussed in this study doesn't relate to the participants' real Dutch skill: it might happen that one participant could speak fluently but all his or her sentences are filled with grammatical mistakes. This approach was chosen because, like mentioned in the introduction, the study simply pursuits to answer whether watching recreational videos could make the participants more confident and less hesitant in Dutch, or in other words, could it make communication in Dutch more automatic for the participants. This is in line with the question about the change in Language Anxiety level, and together they tackle the question whether watching recreational videos could put the participants more at ease and make them have a better subjective feeling about Dutch.

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TABLE I. OVERVIEW OF MEASURES OF FLUENCY

Measure (units)	Definition
(1) Speech rate (syllables/minute)	60 sec./min. times the total number of syllables divided by total time (including pauses) in seconds
(2) Articulation rate (syllables/minute)	60 sec./min. times the total number of syllables divided by total time (excluding pauses) in seconds
(3) Phonation-time ratio (percentage ratio)	Percentage ratio of time speaking to time to take the whole speech sample
(4) Mean length of runs (number of syllables)	Average number of syllables between pauses (period of silence >= 250 ms)
(5) Silent pauses per minute (number of silent pauses/minute)	60 sec./min. times total number of pauses (periods of silence > 200 ms) divided by the total time speaking in seconds
(6) Mean length of pauses (seconds)	Mean length of all pauses (periods of silence > 200 ms)
(7) Filled pauses per minute	60 sec./min. times total number of filled pauses (pauses filled with uhm, mm, er, etc.) divided by the total time speaking in seconds
(8) Dysfluencies per minute (dysfluencies/minute)	60 sec./min. times total number of dysfluencies (repetitions, restarts, repairs) divided by the total time speaking in seconds
(9) Pace (stressed words/minute)	Number of stressed words per minute
(10) Space (ratio of stressed words/total words)	Proportion of stressed words to total number of words

Based on Kormos [58]

B. Question Statement and Research Purpose

The question that this study strives to answer is: does Dutch TV watching have an effect on the Foreign Language Anxiety level and the Utterance Fluency of adult Dutch learners, especially DE DELFTSE METHODE followers. Is it possible for Dutch learners to use entertaining video materials to help themselves to reduce their negative affection and build up their confidence about the language, and to make Dutch more familiar and internalized for them? The purpose of this study is to set one step towards answering whether, how much, and in what way does watching TV programs and movies help with foreign language learning among adults, in order to suggest a method for the adult Dutch learners to help themselves in a way that is easy to keep up to and possibility life-long.

II. MATERIAL AND METHOD

A. Material

Three main materials were used during the research: three questionnaires to evaluate the participants' Foreign Language Anxiety (Language Anxiety) level, four video materials for the experiment group participants to watch during the four experiment weeks, and a Praat Script based on Kormos' summary of fluency measures to run a statistical analysis of the classroom recordings.

1) Foreign Language Classroom Anxiety Scale

To assess the participants' Foreign Language (in this case Dutch) Anxiety level, three questionnaires were used: the Foreign Language Classroom Anxiety Scale (referred to as "Classroom Anxiety Scale" from hereafter), the Foreign Language Listening Anxiety Scale (referred to as "Listening Anxiety Scale" from hereafter), and the Foreign Language Speaking Anxiety Scale (referred to as "Speaking Anxiety Scale" from hereafter). Among them the most fundamental one, the Classroom Anxiety Scale, developed by Horwitz et al. during the self-report research, is adopted to monitor the Language Anxiety level in the five aspects: lack of confidence, fear of failure, lack of eagerness to participate in speaking classes, competitiveness, and perfectionism. The scale is a 5 point (ranging from "strongly agree" to "strongly disagree") Likert scale survey with 33 questions, possible score ranging from 33 to 165, and the higher the score is, the more anxious it indicates the student to be. The alpha coefficient (0.93) of all the questions has testified the internal reliability of this scale, and test-retest result of (r= .83, p< .001) has shown the reliability of the scale in this regard as well. The scale is widely used in research studies, and *"has been found to be a highly reliable scale to measure foreign language anxiety."*[3] Following the success of the Foreign Language Classroom Anxiety scale, similar instruments have been devised for measuring Foreign Language Listening Anxiety (referred to as "Listening Anxiety" from hereafter)[4] and Foreign Language Speaking Anxiety (referred to as "Speaking Anxiety" from hereafter) [5].

2) Video materials

During the four weeks of the experiment, four video materials were provided to the experiment group participants. The video source is the website www.uitzendinggemist.nl. The reasons why this platform was chosen are:

- It provides videos that are broadcasted on TV in the Netherlands, which makes it closer to the authentic and original life, culture, and Dutch language in the Netherlands;
- A lot the experiment group participants did not have a TV set at home but they all had a computer, so this online channel was easier and the most suitable for the experiment;
- Access to the videos on this website is for free, so the participants did not have to pay for watching;
- The quality of the videos on the website is high enough so that the watching experience could be enjoyable;

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For most of the videos on the website, it is possible to turn on the captions(called TELETEXT SUBTITLES in the UK, CLOSED CAPTIONS in North America and elsewhere, and SAME LANGUAGE SUBTITLES in India and other countries), and all the experiment group participants were asked to do so for all the videos they were watching. This is essential to this experiment because all the participants were at the beginning of the intermediate level according to DE DELFTSE METHODE, which means that their Dutch vocabulary was around 2300 words, and they would have a great difficulty understanding spoken Dutch even with the aid of the images because a 3000 words vocabulary is the basis for understanding and using a language [12]. Thus the subtitles could help them a lot with understanding the videos so that they could have an enjoyable experience, and also according to the literature (e.g.), there is a reason to believe captioned programs might be helpful for improving some of the learner-viewers' skills in the target language and reduce their anxiety[1][13], which suits the objective of this study.

The specific videos used in the experiment are:

Week 1, ZAPPBIOS TELEFILMS: RABARBER.

(http://www.uitzendinggemist.nl/afleveringen/1397638)

It is a family movie from two children's perspective.

Week 2, the first part of REMBRANDT EN IK.

(http://www.uitzendinggemist.nl/afleveringen/1048594)

It is a movie that tells the famous painter Rembrandt's life through the eyes of his friend, an ordinary Leiden boy Jan Lievens.

Week 3, the first two episodes of STARTUP.

(http://www.uitzendinggemist.nl/afleveringen/1388043, http://www.uitzendinggemist.nl/afleveringen/1388175)

It is a contemporary TV series about young people with big dreams, entrepreneurs. It is about seizing opportunities, pursuing ideals, limits retrieval and the challenges associated with entrepreneurship.

Week 4, the episode WORDT NEDERLAND MINDER MANNELIJK? of the popular science show FACTCHECKERS.

(http://www.uitzendinggemist.nl/afleveringen/1412829)

It talks about questions such as has Dutch males become wimpier, what happens to the testosterone levels of young fathers, and is male-female friendship possible.

These four videos were chosen because of three reasons:

- Their language complexity are neither too low nor too overwhelming to the participants;
- Given the situation of the participants (find the basic personal information of the participants in the appendix, Table II), their contents are close to the participants own life, so that the participants would stay interested and feel related.
- These four videos belong to different genres, and this is to cover potentially different interests of the participants and to simulate programs that they would watch in their leisure time every day.

3) Praat Script

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[1] It is unclear if this "anxiety" here is the Foreign Language Classroom Anxiety

Praat is a speech phonetics analysis software application developed by Paul Boersma and David Weenink of the University of Amsterdam in 1990s, and it has been widely adopted in scientific studies. It is provided for free and can be run on a wide range of operating systems. The details and tutorials of it can be found on the website:

http://www.fon.hum.uva.nl/praat/

Various scripts for Praat have been developed for different research purposes, among which is the one developed by Nivja de Jong and Ton Wempe for "*automatically detecting syllable nuclei in order to measure speech rate without the need for a transcription*"[14](see Nivja de Jong & Ton Wempe, 2009). The introduction, tutorial and the script itself can be found on the website:

https://sites.google.com/site/speechrate/Home

The script produces a text file with the statistical profile of the analyzed recordings under 7 measures: number of syllables, number of (silent) pauses, phonation time (in seconds), speech rate (syllables/second), articulation rate (syllables/second), and mean syllable duration (seconds). It also plots out the analysis result for a clearer reviewing (see Fig. 1.).

Also, in 2013, Nivja de Jong gave a LANGSNAP workshop, guiding users through analysing speech recordings in Praat using the script mentioned above. Nine acoustic measures of the Utterance Fluency based on Kormos' ten measures were proposed during the workshop. The speech recording analysis part of this study was done using this script and following this workshop instruction.

B. Participants

The participants were 14 adults with diverse international background: Asian, South American, North American, East European, South European, and North European, and they were all following the course "Nederlands voor Buitenlanders, De Delftse Methode" in Delft University of Technology. The participants were in the intermediate course group, using the second textbook of DE DELFTSE METHODE, TWEEDE RONDE. NEDERLANDS VOOR BUITENLANDERS. DELFTSE METHODE, and they were all at a similar level at the beginning of the course with an approximately 2300 words' vocabulary [15]. Table II shows all the personal details of the participants.
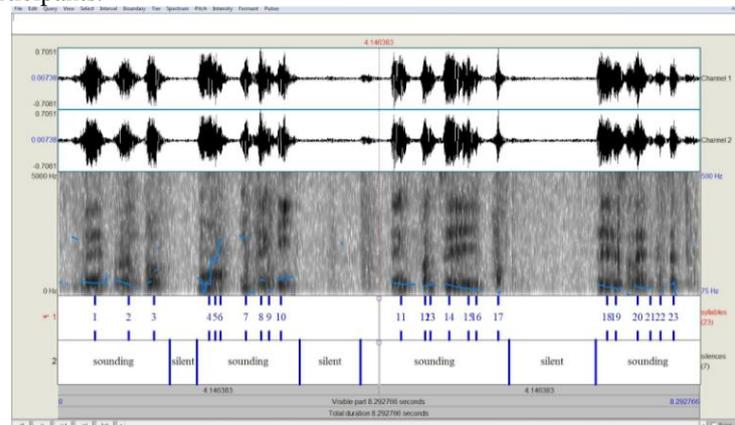
Fig. 1. Figure 1Plot of Praat analysis result

C. Setting

In order to answer the question, a controlled experiment was conducted within DE DELFTSE METHODE course in Delft University of Technology. During the course there would be two class sessions per week: Monday from 18:00 to 19:00 and Thursday from 18:00 to 19:00. The course followers and also the experiment participants would get familiarized with the texts before class and they would talk about the text during the class, and being led by the teacher's questions, everybody would have a chance for several minutes spontaneous conversations developed upon the text. The researcher of this study, Xiaotong Shang, also took part in the course. In addition to the researcher, there were 14 course followers, and they all participated in the research. The 14 participants were divided into two groups: 7 in the experiment group (EG) and 7 in the control group (CG), and this division was not random but based on the personal relationship with the researcher and asked as a personal favor, but since the research had no personal influence on the class conversation, this factor is irrelevant to the experiment result. Before the experiment, the Classroom Anxiety Scale, Speaking Anxiety Scale, and Listening Anxiety Scale questionnaires were handed out to all the participants to get the initial anxiety level of all participants. The experiment started on Thursday, May 8th, 2014. Every Monday and Thursday after that until Thursday June 5th, the researcher would go to the class and record the whole class session without mentioning to the participants (permission to use was acquired after closing the experiment). Every Friday she would send a link to all the participants in the experiment group via email, directing them to video materials that were longer than 30 minutes on *uitzendinggemist* website (see the *Material* section), and they would watch the videos for at least 30 minutes. This was going on for four weeks, so the experiment group watched videos in Dutch for four weeks, minimum 120 minutes in total, but could be longer if the participants personally decided to keep watching. At the same time, the control group participants were told to avoid watching entertaining videos in Dutch. After the four weeks, the above mentioned three questionnaires were handed out to all the participants again to measure the level of anxiety. On receiving all the questionnaires back, scores were calculated by adding up all the items in the scales, and all the scores of before and after the experiment were put into a Google spreadsheet for analysis. Also during the four weeks, eight audio recordings of the class sessions were acquired. After the experiment, all the recordings were augmented and cut into speech fragments of each person in Adobe Audition, and after that all the fragments were analyzed in Praat with the script mentioned in the *Material* section above, and in the end statistics of the Utterance Fluency measurements were generated and put into a Google spreadsheet file. Note that there were one measure being calculated in addition to the nine measures proposed in de Jong's workshop to include the measure for Repair Fluency, and that is the number of repairs per second (phonation time). This measure was not generated automatically with the script in Praat due to the natural language processing limitation of it, and all the numbers of repairs were manually counted by the researcher.

D. Data Evaluation and Analysis

For the question about the Classroom Anxiety Scale, based on the calculated total scores mentioned above, a paired sample t-test was done for the experiment group to see if there was a significant change in it between before and after the experiment, and the same was done for Speaking Anxiety Scale and Listening Anxiety Scale of the experiment group, and the same procedure for the three questionnaire results was done for all the three scales for the control group. For both groups, if there was a change in Classroom Anxiety Scale, Speaking Anxiety Scale, and Listening Anxiety Scale, the significant value should be below 0.05, and otherwise it would suggest that there is no change, and watching recreational videos in Dutch did not have an influence on the correspondent anxiety in this case.

As for the Utterance Fluency, for every session, and for every participant, a mean number was calculated for every measure, based on all the utterance fragments of this session and this person. Thus within every session, every participant has 10 mean numbers for the 10 measures. Then a comparison was drawn between the experiment group and the control group. First, for every measure, the mean number x was calculated for the whole experiment group and the mean number y for the control group, and upon that a ratio x/y was calculated. In the end, the ratios (x/y) for all the parameters were drawn into line charts to show the change of this ratio for the correspondent parameter during the eight sessions. According to the patterns and trends of the lines in the charts, a rudimental conclusion could be drawn about whether the experiment group was progressing faster (or potentially slower) than the control group in Utterance Fluency, which would suggest whether and how watching recreational videos in Dutch could influence the Utterance Fluency in L2 acquisition.

Analysis has also been done on the individual level. For every participant in both groups, the change of Classroom Anxiety Scale, Speaking Anxiety Scale, and Listening Anxiety Scale, and the change of Utterance Fluency during the four weeks were put together for evaluation to gain further insights of the dynamics of the condition of the participants during the experiment period. Further discussion on this will be presented in the *Discussion* part of the thesis.

III. RESULTS

A. Questionnaire Results

During the questionnaire collection, everything carried out as the experiment design, except that one participant in the control group (CG) refused to fill in the questionnaires, so the data from one person are absent in the CG result, and potentially that might have influenced the total result and the conclusion to some extent.

For the rest, the statistical analysis in PASW Statistics 18 reveals the result as follows:

1) Classroom Anxiety Scale

All the Classroom Anxiety Scale results for both groups for before and after the experiment obey normal distribution (see Fig. 2 and Fig. 3).

The paired-sample t-test results show that at 5% significant level, the EG did have a significant change in Classroom Anxiety Scale ($p = 0.016$, $p < 0.05$), whereas the CG did not have a significant change in Classroom Anxiety Scale ($p = 0.515$, $p > 0.05$) (see Fig. 4 and Fig. 5).

One-Sample Kolmogorov-Smirnov Test

		Before
N		7
Normal Parameters[a,b]	Mean	94,1429
	Std. Deviation	11,66803
Most Extreme Differences	Absolute	,260
	Positive	,260
	Negative	-,244
Kolmogorov-Smirnov Z		,689
Asymp. Sig. (2-tailed)		,729

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		After
N		7
Normal Parameters[a,b]	Mean	87,1429
	Std. Deviation	12,30757
Most Extreme Differences	Absolute	,187
	Positive	,187
	Negative	-,099
Kolmogorov-Smirnov Z		,493
Asymp. Sig. (2-tailed)		,968

a. Test distribution is Normal.

b. Calculated from data.

Fig. 2. Classroom Anxiety Scale test result for normal distribution for before and after the experiment for the EG

One-Sample Kolmogorov-Smirnov Test

		Before
N		6
Normal Parameters[a,b]	Mean	85,3333
	Std. Deviation	13,95230
Most Extreme Differences	Absolute	,233
	Positive	,233
	Negative	-,136
Kolmogorov-Smirnov Z		,571
Asymp. Sig. (2-tailed)		,900

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		After
N		6
Normal Parameters[a,b]	Mean	82,8333
	Std. Deviation	9,38971
Most Extreme Differences	Absolute	,160
	Positive	,160
	Negative	-,147
Kolmogorov-Smirnov Z		,392
Asymp. Sig. (2-tailed)		,998

a. Test distribution is Normal.

b. Calculated from data.

Fig. 3. Classroom Anxiety Scale test result for normal distribution for before and after the experiment for the CG

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	94,1429	7	11,66803	4,41010
	After	87,1429	7	12,30757	4,65182

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	7	,893	,007

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	7,00000	5,56776	2,10442	1,85068	12,14932	3,326	6	,016

Fig. 4. EG Classroom Anxiety Scale paired-sample t-test result

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	85,3333	6	13,95230	5,69600
	After	82,8333	6	9,38971	3,83333

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	6	,788	,063

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	2,50000	8,73499	3,56604	-6,66681	11,66681	,701	5	,515

Fig. 5. CG Classroom Anxiety Scale paired-sample t-test result

2) Speaking Anxiety Scale

All the Speaking Anxiety Scale results for both groups for before and after the experiment obey normal distribution (see Fig. 6 and Fig. 7).

One-Sample Kolmogorov-Smirnov Test

		Before
N		7
Normal Parameters[a,b]	Mean	51,1429
	Std. Deviation	8,53285
Most Extreme Differences	Absolute	,155
	Positive	,155
	Negative	-,144
Kolmogorov-Smirnov Z		,411
Asymp. Sig. (2-tailed)		,996

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		After
N		7
Normal Parameters[a,b]	Mean	45,5714
	Std. Deviation	7,95523
Most Extreme Differences	Absolute	,286
	Positive	,286
	Negative	-,141
Kolmogorov-Smirnov Z		,756
Asymp. Sig. (2-tailed)		,616

a. Test distribution is Normal.

b. Calculated from data.

Fig. 6. Speaking Anxiety Scale test result for normal distribution for before and after the experiment for the EG

One-Sample Kolmogorov-Smirnov Test

		After
N		6
Normal Parameters[a,b]	Mean	43,8333
	Std. Deviation	6,85322
Most Extreme Differences	Absolute	,207
	Positive	,207
	Negative	-,176
Kolmogorov-Smirnov Z		,507
Asymp. Sig. (2-tailed)		,960

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		Before
N		6
Normal Parameters[a,b]	Mean	45,0000
	Std. Deviation	5,79655
Most Extreme Differences	Absolute	,198
	Positive	,198
	Negative	-,183
Kolmogorov-Smirnov Z		,484
Asymp. Sig. (2-tailed)		,973

a. Test distribution is Normal.

b. Calculated from data.

Fig. 7. Speaking Anxiety Scale test result for normal distribution for before and after the experiment for the CG

Before the experiment, for the 7 participants of the experiment group (EG), the mean Speaking Anxiety Scale score is 51.143 with the standard deviation being 8.533. As for the 6 participants of the CG, the mean Speaking Anxiety Scale is 45.000 with the standard deviation being 5.797. After the experiment, for the 7 participants of the experiment group (EG), the mean Speaking Anxiety Scale score is 45.571 with the standard deviation being 7.955. As for the 6 participants of the CG, the mean Speaking Anxiety Scale is 43.833 with the standard deviation being 6.853.

The paired-sample t-test results show that at 5% significant level, the EG did have a significant change in Speaking Anxiety Scale ($p = 0.034$, $p < 0.05$), whereas the CG did not have a significant change in Speaking Anxiety Scale ($p = 0.677$, $p > 0.05$) (see Fig. 8 and Fig. 9).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	51,1429	7	8,53285	3,22511
	After	45,5714	7	7,95523	3,00680

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	7	,787	,036

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	5,57143	5,41163	2,04540	,56651	10,57635	2,724	6	,034

Fig. 8. Speaking Anxiety Scale paired-sample t-test result

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	45,0000	6	5,79655	2,36643
	After	43,8333	6	6,85322	2,79782

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	6	,488	,326

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	1,16667	6,46271	2,63839	-5,61554	7,94887	,442	5	,677

Fig. 9. CG Speaking Anxiety Scale paired-sample t-test result

3) Listening Anxiety Scale

All the Listening Anxiety Scale results for both groups for before and after the experiment obey normal distribution (see Fig. 10 and Fig. 11).

One-Sample Kolmogorov-Smirnov Test

		Before
N		7
Normal Parameters[a,b]	Mean	97,4286
	Std. Deviation	15,10913
Most Extreme Differences	Absolute	,326
	Positive	,326
	Negative	-,187
Kolmogorov-Smirnov Z		,864
Asymp. Sig. (2-tailed)		,445

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		After
N		7
Normal Parameters[a,b]	Mean	86,1429
	Std. Deviation	14,02888
Most Extreme Differences	Absolute	,247
	Positive	,247
	Negative	-,162
Kolmogorov-Smirnov Z		,653
Asymp. Sig. (2-tailed)		,788

a. Test distribution is Normal.

b. Calculated from data.

Fig. 10. Listening Anxiety Scale test result for normal distribution for before and after the experiment for the EG

One-Sample Kolmogorov-Smirnov Test

		Before
N		6
Normal Parameters[a,b]	Mean	93,6667
	Std. Deviation	13,32166
Most Extreme Differences	Absolute	,218
	Positive	,218
	Negative	-,175
Kolmogorov-Smirnov Z		,533
Asymp. Sig. (2-tailed)		,939

a. Test distribution is Normal.

b. Calculated from data.

One-Sample Kolmogorov-Smirnov Test

		After
N		6
Normal Parameters[a,b]	Mean	88,6667
	Std. Deviation	14,26417
Most Extreme Differences	Absolute	,296
	Positive	,296
	Negative	-,153
Kolmogorov-Smirnov Z		,725
Asymp. Sig. (2-tailed)		,669

Fig. 11. Listening Anxiety Scale test result for normal distribution for before and after the experiment for the CG

Before the experiment, for the 7 participants of the experiment group (EG), the mean Listening Anxiety Scale score is 97.429 with the standard deviation being 15.109. As for the 6 participants of the CG, the mean Listening Anxiety Scale is 93.667 with the standard deviation being 13.322. After the experiment, for the 7 participants of the experiment group (EG), the mean Listening Anxiety Scale score is 86.143 with the standard deviation being 14.029. As for the 6 participants of the CG, the mean Listening Anxiety Scale is 88.667 with the standard deviation being 14.264.

The paired-sample t-test results show that at 5% significant level, the EG did have a significant change in Listening Anxiety Scale ($p = 0.007$, $p < 0.05$), whereas the CG did not have a significant change in Listening Anxiety Scale ($p = 0.333$, $p > 0.05$) (see Fig. 12 and Fig. 13).

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	97,4286	7	15,10913	5,71071
	After	86,1429	7	14,02888	5,30242

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	7	,872	,010

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	11,28571	7,43223	2,80912	4,41204	18,15938	4,018	6	,007

Fig. 12. EG Listening Anxiety Scale paired-sample t-test result

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	93,6667	6	13,32166	5,43855
	After	88,6667	6	14,26417	5,82332

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before & After	6	,658	,155

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Before - After	5,00000	11,43678	4,66905	-7,00217	17,00217	1,071	5	,333

Fig. 13. CG Listening Anxiety Scale paired-sample t-test result

B. Acoustic Measures of Utterance Fluency with Praat

Firstly, after running the script mentioned in the *Material* session above in Praat, the statistics for all the recordings were generated for the 7 measures, and in addition, the numbers of repairs were counted manually by the researcher for all the recordings so that the change in Repair Fluency could also be shown. With these statistics, based on de Jong's workshop instruction and the 10 measures summarized by Kormos, statistics of 10 measures of Utterance Fluency of the 14 participants during the 8 sessions were calculated in Google Spreadsheet, and they are:

- For Speed Fluency: Speech rate (syllables divided per total time) and Articulation rate (syllables divided by phonation time);
- For Breakdown Fluency: Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1)), Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1)), Number of pauses per second (total time), Number of pauses per second (speaking time), Mean pause duration (total length of silent pauses divided by total number of silent pauses+1), Phonation time ratio (phonation time divided by total time), and Mean length of runs (number of syllables divided by (number of silent pauses+1));
- For Repair Fluency: Number of repairs per second (phonation time).

Note that in this study, all the statistics involving time dimension are on the second scale to simplify the calculation. When running the script, there are three thresholds to be set: silence threshold (the minimum dB to be considered as silence), minimum dip between peaks (the minimum dB between two peaks to separate two syllables), and minimum pause duration (the minimum time span for a silent slot to be considered as a pause). In this analysis, the silence threshold was set to -25 dB and the minimum dip between peaks was set to 2 dB, both based on the suggestion written in the script. As for the minimum pause duration, the literature is rather unclear about it, and a wide range of minimum pause durations could be found across studies. However, most researchers agree on the criterion of no less than 200 ms and no more than 300 ms. Thus 250 ms was chosen for the minimum pause duration for this analysis.

Secondly, like mentioned in the *Data Evaluation and Analysis* session, since in most cases, in every session, each

participants has spoken more than one sentences, thus within every session, 10 mean numbers for the 10 measures were calculated upon all the sentences from one person, and this is done for all the participants from both groups, i.e. within every session, every participant has a set of mean numbers for the 10 measures, and this set of numbers together profiles this person's Utterance Fluency of this session.

Table III to Table XVI in the appendix shows all the results mentioned above.

IV. DISCUSSION

The questionnaire results show that for the EG, comparing the Classroom Anxiety Scale, Speaking Anxiety Scale and Listening Anxiety Scale of pre- and post-experiment scores, there are meaningful changes in all of them, whereas for the CG there is no meaningful change in any of the three anxiety scales. This shows clearly that in this setting, there is a factor that has made a difference between the two groups, and given the controlled situation of the experiment, there is a very high probability that this factor is the recreational video watching. In other words, watching recreational videos in Dutch has caused a decrease in Foreign Language Classroom Anxiety (referred to as "Classroom Anxiety" from hereafter), Speaking Anxiety, and Listening Anxiety among the experiment group.

Further, a more detailed insight into the five specific aspects of Classroom Anxiety is worth taking by clustering the results of items in Classroom Anxiety Scale:

A. Lack of Confidence.

This involves items 1, 12, 15, 17, 22 and 29 in Classroom Anxiety Scale. For the EG, before the experiment, the mean of the sum of these six scores is 18.143 with a standard deviation of 2.734, and the post-experiment mean sum is 15.000 with a standard deviation of 3.338. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.150$). For the CG, the pre-experiment mean sum is 16.167 with a standard deviation of 4.195, and the post-experiment mean sum is 14.500 with a standard deviation of 2.563. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.122$).

B. Fear of Failure.

This is shown through items 2, 4, 9, 14, 18, 23, 28 in Classroom Anxiety Scale. Before the experiment, the mean of the sum of these seven scores is 21.286 with a standard deviation of 3.094, and the post-experiment mean sum is 18.571 with a standard deviation of 4.541. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.083$). For the CG, the pre-experiment mean sum is 18.500 with a standard deviation of 4.680, and the post-experiment mean sum is 18.667 with a standard deviation of 3.615. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.930$).

C. Lack of Eagerness to Participate in Speaking Classes.

Items 5, 6 and 16 in Classroom Anxiety Scale are relevant to this aspect. Before the experiment, the mean of the sum of these three scores is 7.429 with a standard deviation of 1.718, and the post-experiment mean sum is 7.857 with a standard deviation of 1.215. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.573$). For the CG, the pre-experiment mean sum is 7.833 with a standard deviation of 1.941, and the post-experiment mean sum is 7.667 with a standard deviation of 1.506. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.695$).

D. Competitiveness.

This concerns items 7 and 21 in FLSCA. Before the experiment, the mean of the sum of these two scores is 5.429 with a standard deviation of 1.134, and the post-experiment mean sum is 5.143 with a standard deviation of 1.464. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.715$). For the CG, the pre-experiment mean sum is 4.667 with a standard deviation of 1.751, and the post-experiment mean sum is also 4.667 with a standard deviation of 1.506. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 1.000$).

E. Perfectionism.

This aspect is assessed by items 8, 20, 27 and 31 in Classroom Anxiety Scale. Before the experiment, the mean of the sum of these four scores is 10.286 with a standard deviation of 2.889, and the post-experiment mean sum is 9.714 with a standard deviation of 1.254. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.356$). For the CG, the pre-experiment mean sum is 8.500 with a standard deviation of 1.871, and the post-experiment mean sum is 8.667 with a standard deviation of 1.751. Thus the paired-sample t-test result shows that there is no meaningful change at 5% significant level ($p = 0.833$).

Hence, these results show that in this case, the decrease in the EG's Classroom Anxiety is a compound of all the five aspects and there is no outstanding source to account for it. However, this does not mean that given a longer experiment time span, the situation would be the same: the change in one or a few aspects, for example lack of confidence and perfectionism, might become more significant.

As for the result of acoustic measures of the Utterance Fluency, further analyses were done both on the group level and the individual level.

On the group level, a comparison was drawn between the two groups. Within every class session, for every measure mentioned in the *Results* section, based on the result of every person, a mean result number x was calculated for the whole experiment group, and a mean number y for the control group, and upon that the ratio x/y was calculated. Thus for every session, 10 ratios was calculated, and this was done for all the 8 sessions. In other words, looking horizontally, for every measure, a ratio between the EG and CG was calculated for the 8 sessions, so that the change of this ratio during the 8 sessions is shown. In this way, the comparison of the Utterance Fluency performance of the two groups was demonstrated. This is done to exclude other factors, for example the difficulty increase in

the classes, that might influence the Utterance Fluency performance and to look at the effect that watching these videos might have produced on the Utterance Fluency alone. Line charts (see Fig. 14 to Fig. 23) of these ratios were drawn to illustrate the trend of them, and these charts also indirectly illustrate the effect of the recreational video watching which should have the same trend, given that other factors were excluded by the comparison.
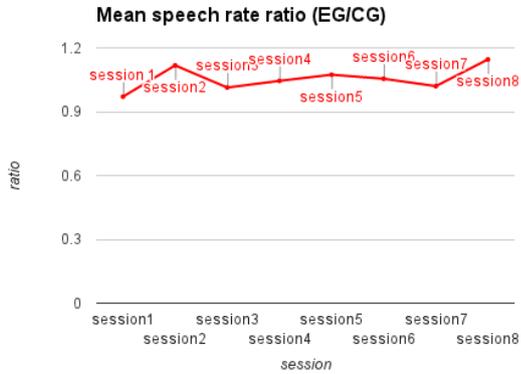
Fig. 14. The ratio (EG/CG) of mean speech rate
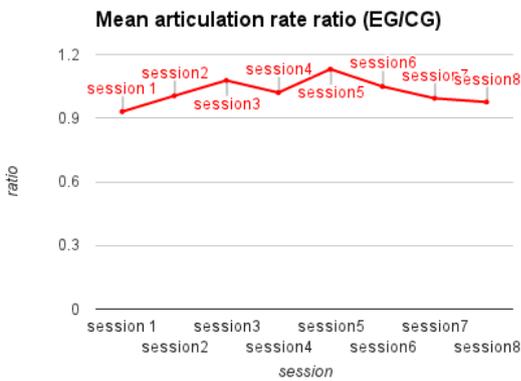
Fig. 15. The ratio (EG/CG) of mean articulation rate
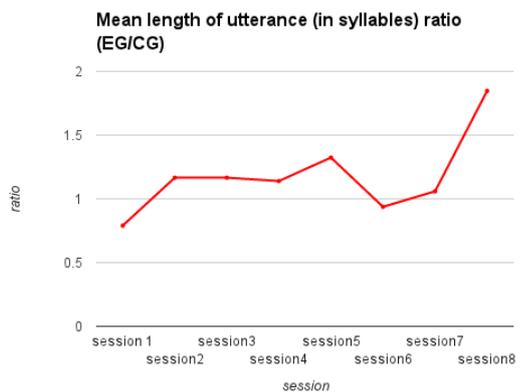
Fig. 16. The ratio (EG/CG) of mean length of utterance (in syllables)
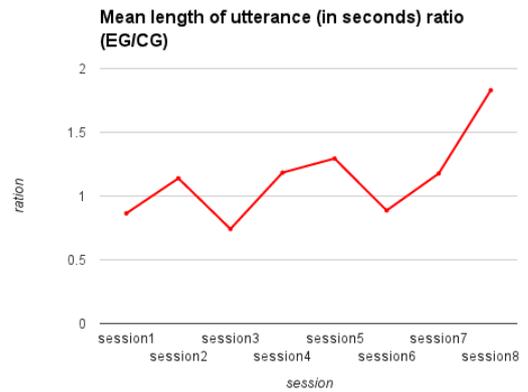
Fig. 17. The ratio (EG/CG) of mean length of utterance (in seconds)
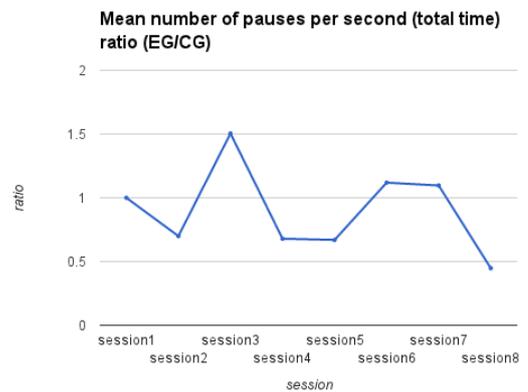
Fig. 18. The ratio (EG/CG) of mean number of (silent) pauses per second (total time)
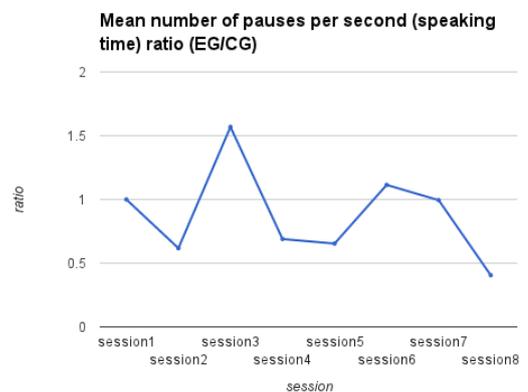
Fig. 19. The ratio (EG/CG) of mean number of (silent) pauses per second (speaking time)

12
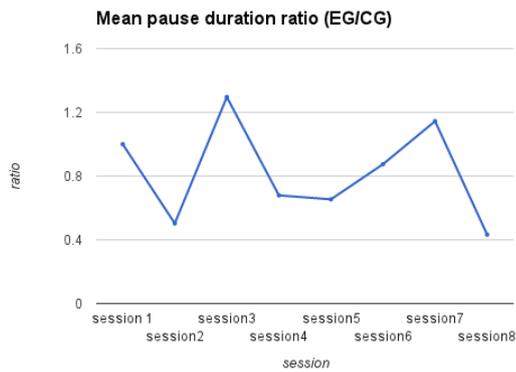
Fig. 20. The ratio (EG/CG) of mean (silent) pause duration
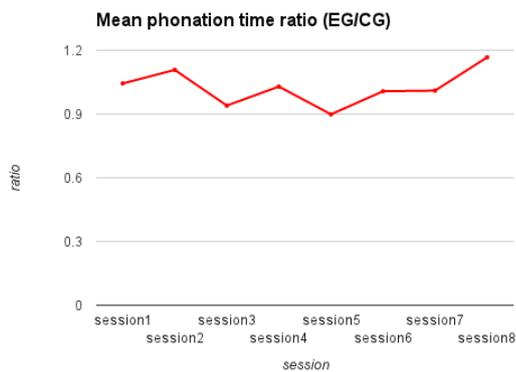
Fig. 21. The ratio (EG/CG) of phonation time ratio
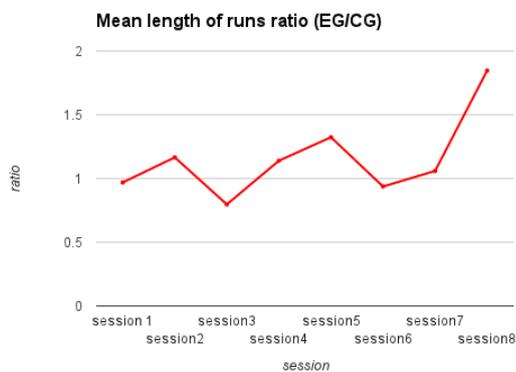
Fig. 22. The ratio (EG/CG) of mean length of runs
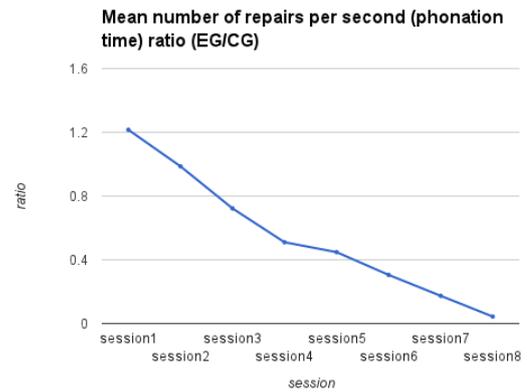
Fig. 23. The ratio of mean number of repairs per second

The speech rate is related to Utterance Fluency positively, meaning that the larger the number is, the better Utterance Fluency it shows. A scattered plot was drawn and it seems to show a trend of development, so a linear regression line was drawn for a clearer illustration. This plot shows that during the 8 sessions, comparing with the CG, the EG was progressing on the speech rate more rapidly. (See Fig. 24.)

The articulation rate is related to Utterance Fluency positively. The result does not show any obvious trend of the curve, but every point is higher than the first one. So despite that the comparison between EG and CG doesn't have a clear development, in total the EG did have a slightly bigger progress on articulation rate than the CG.

The length of utterance, both in syllables and in seconds, is related to Utterance Fluency positively. Scattered plots were drawn and it seems to show a trend of development, and this trend is consistent in both syllables and seconds, so linear regression lines was drawn for a clearer illustration. The plots show that during the 8 sessions, comparing with the CG, the EG was progressing on the length of utterance more rapidly. (See Fig. 25 and Fig. 26.)
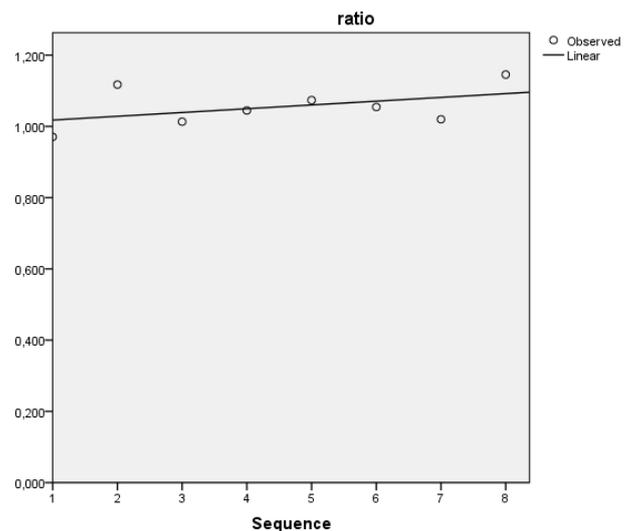
Fig. 24. Linear regression of the ratio (EG/CG) of mean speech rate

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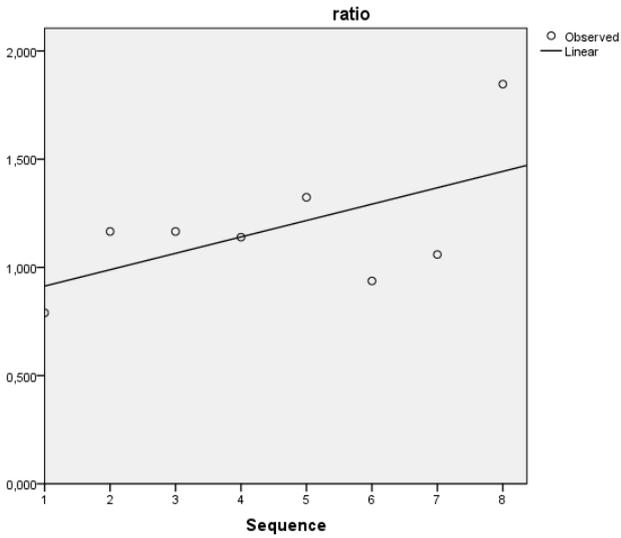
Fig. 25. Linear regression of the ratio (EG/CG) of mean length of utterance (in syllables)
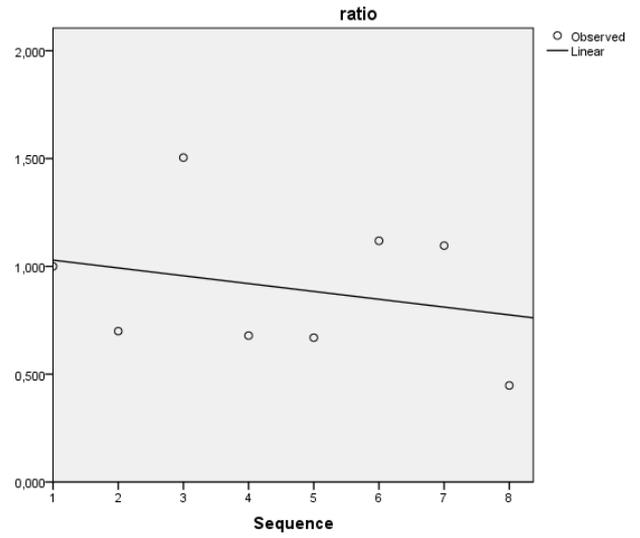
Fig. 27. Linear regression of the ratio (EG/CG) of mean number of (silent) pauses per second (total time)
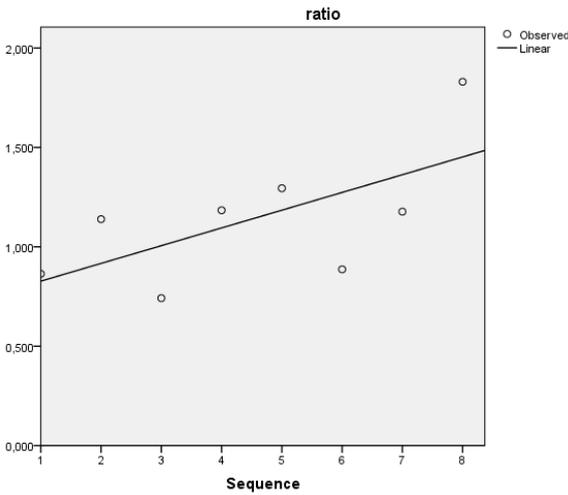
Fig. 26. Linear regression of the ratio (EG/CG) of mean length of utterance (in seconds)
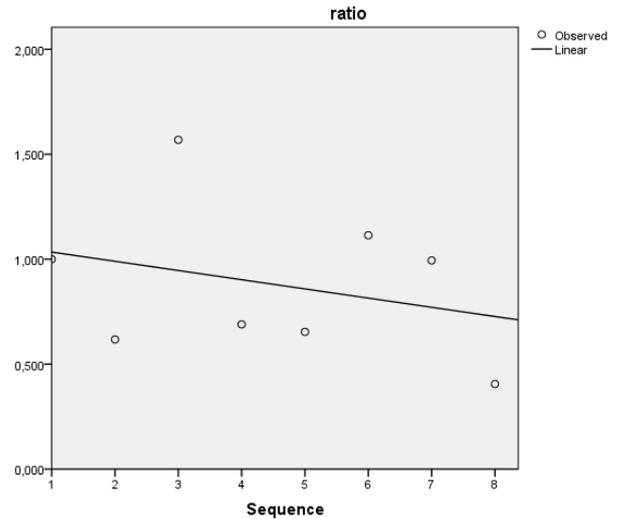
Fig. 28. Linear regression of the ratio (EG/CG) of mean number of (silent) pauses per second (speaking time)

The number of pauses per second is related to Utterance Fluency negatively, meaning that the lower the number is, the better Utterance Fluency it shows. Scattered plots were drawn and it seems to show a trend of decrease, and this is consistent both in total time and phonation time, so linear regression lines was drawn for a clearer illustration. The plots show that during the 8 sessions, comparing with the CG, the EG was progressing on making less pauses more rapidly. (See Fig. 27 and Fig. 28.)

The pause duration is related to Utterance Fluency negatively. The result does not show any obvious trend of the curve, and despite the fact that the ratio of the last session is the lowest, the third session has a higher ratio than the first one. So the result of this measure is not conclusive.

The phonation time ratio is related to Utterance Fluency positively. The result does not show any obvious trend of the curve, and despite the fact that the ratio of the last session is the highest, there are five ratios in between that are lower than the first one. So the result of this measure is not conclusive.

Mean length of runs is related to Utterance Fluency positively. Scattered plots were drawn and it seems to show a trend of development, so linear regression lines was drawn to a clearer illustration. The plots show that during the 8 sessions, comparing with the CG, the EG was progressing on making longer runs more rapidly. (See Fig. 29.)
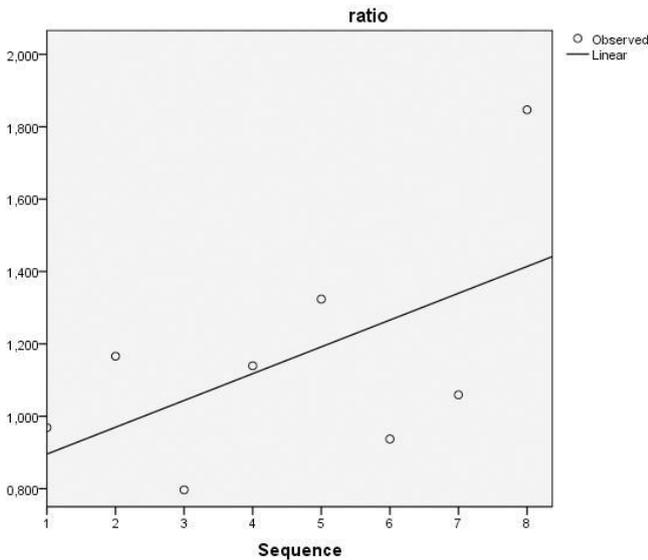
Fig. 29. Linear regression of the ratio (EG/CG) of mean length of runs

Fig. 31. Mean speech rate results of EGP4

The number of repairs per second (phonation time) is related to Utterance Fluency negatively. The line chart itself shows a clear trend for decrease, and linear regression lines was drawn for a clearer illustration. The plots show that during the 8 sessions, comparing with the CG, the EG was progressing on making less repairs more rapidly. (See Fig. 30.)

Further, discussions and analyses were done on the individual level over both the Language Anxiety and the Utterance Fluency performance. For the EG participants, most of the individual results on both the Language Anxiety and the Utterance Fluency are consistent with the group average results, except for participant EGP4 (experiment group participant number 4). Despite that his Classroom Anxiety Scale, Speaking Anxiety Scale, and Listening Anxiety Scale all had a decrease during the four weeks, his initial Speaking Anxiety Scale is much higher than the group average (57 comparing with 51.143), and both his initial and final Listening Anxiety Scale are significantly higher than the group average (119 comparing with 97.429, and 100 comparing with 86.143). His results of the Utterance Fluency measures are rather inconsistent throughout the four weeks (see Fig. 31 to Fig. 40).

Fig. 32. Mean articulation rate results of EGP4
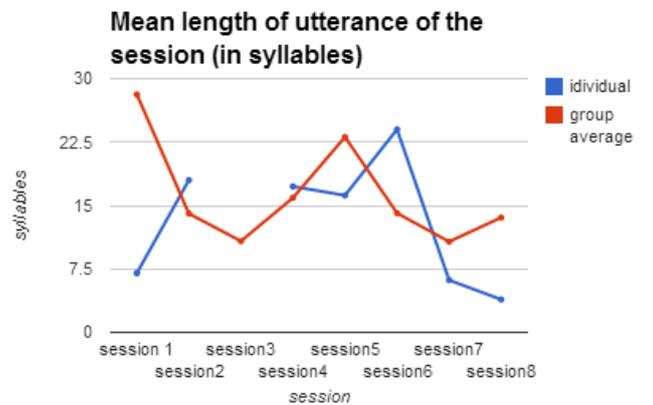
Fig. 33. Mean length of utterance (in syllables) results of EGP4

Fig. 30. Linear regression of the ratio (EG/CG) of mean number of repairs per second

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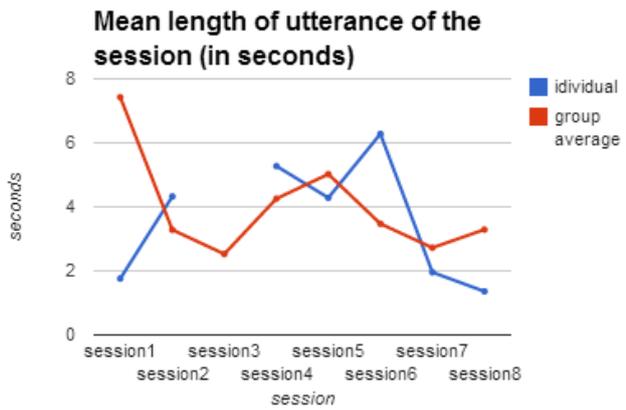
Fig. 34. Mean length of utterance (in seconds) results of EGP4
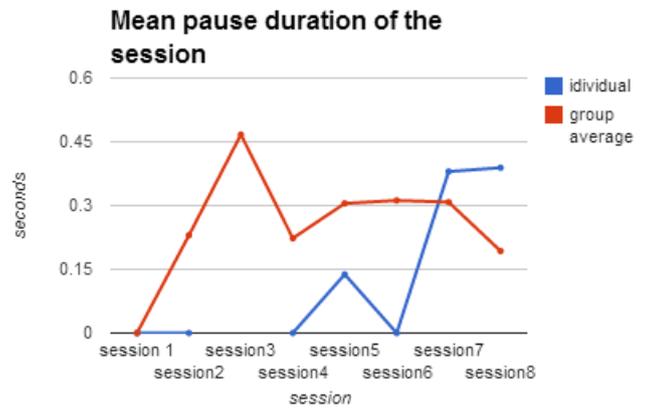
Fig. 37. Mean pause duration results of EGP4
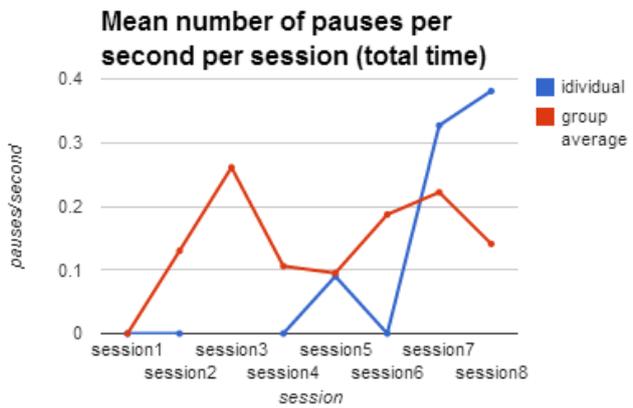
Fig. 35. Mean number of pauses per second (total time) results of EGP4
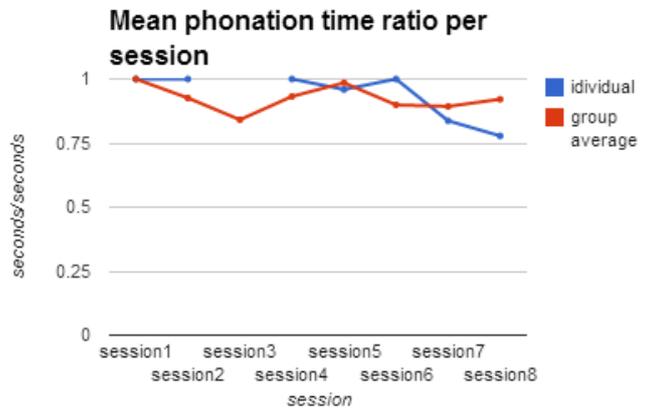
Fig. 38. Mean phonation time ratio results of EGP4
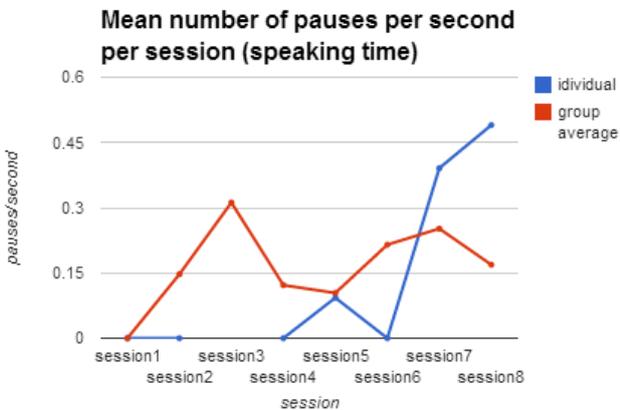
Fig. 36. Mean number of pauses per second (speaking time) results of EGP4
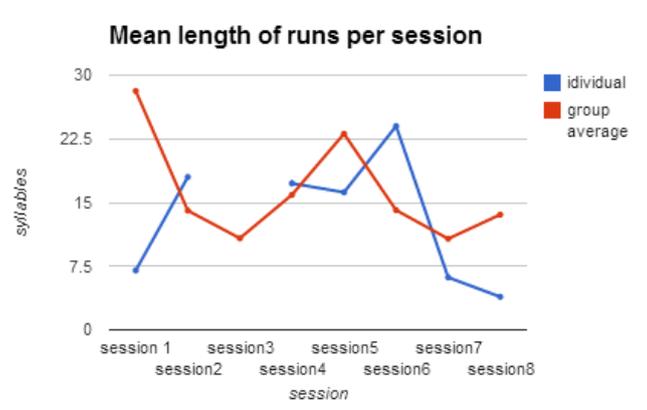
Fig. 39. Mean length of runs results of EGP4
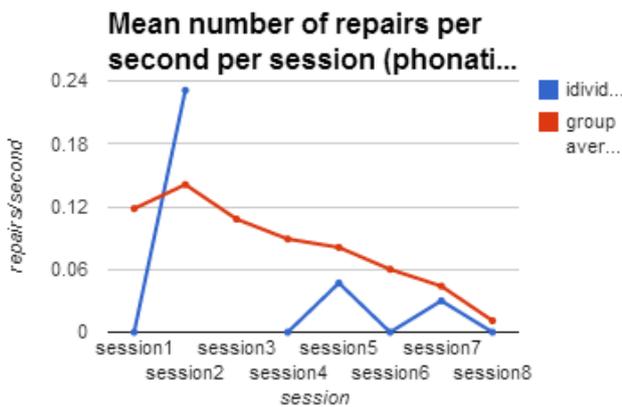
Fig. 40. Mean number of repairs per second (phonation time) results of EGP4

These results illustrate that his speed fluency was decreasing, and he was making more pauses during the eight sessions, and the results in other aspects are inconclusive. The real-life classroom observation of this person is that his knowledge related to semantics (e.g. grammar, sentence structures, and vocabulary) was rather satisfying comparing with other learners, but he would tend to be more hesitant, which is consistent with his high Language Anxiety level. Hence the case might be that this anxiety made him more sensitive to the constant increase in the difficulty of the class and thus the fluctuation in the Utterance Fluency of his classroom performance. This could be supported by the fact that in the CG, there are three participants whose Language Anxiety had a significant increase during the four weeks. To be more specific, the first one is CGP3, and his Classroom Anxiety Scale ascended from 70 to 84, and his Listening Anxiety Scale from 85 to 90; the second one is CGP4, whose Listening Anxiety Scale increased from 109 to 115; and the last one is CGP6, whose Speaking Anxiety Scale leaped from 42 to 53. For the CG in general, the performance with all the measures of Utterance Fluency deteriorated during the four weeks. These two phenomena are highly likely to be caused by the increase in difficulty of the class content, and this increase in difficulty might have been suppressing the effect of watching the video materials for the EG.

Meanwhile, it is clear from the results that for the EG, there is no significant increase in any of the Language Anxiety aspects, and none of the Utterance Fluency measures showed an obvious deterioration.

V. CONCLUSION

From all the results and discussions, the conclusion could be drawn that in this specific scenario and with this specific setting, the four sessions of recreational video watching did have a positive impact on the EG's affection with Dutch. To be more specific, the EG's negative affection with listening to Dutch, speaking in Dutch, and learning Dutch in general has had a meaningful reduction according to the results of the paired sample t-test for the EG (p = 0.007 for Listening Anxiety Scale, p = 0.034 for Speaking Anxiety Scale, p = 0.016 for the Classroom Anxiety Scale). Whereas for the CG, there is no decrease in listening, speaking or learning in general

of the Dutch language according to the results of paired sample t-test for the CG (p = 0.333 for Listening Anxiety Scale, p = 0.677 for Speaking Anxiety Scale, p = 0.515 for the Classroom Anxiety Scale). So this is to say, the EG participants' became less apprehensive about communication, less anxious about tests, experienced less fear of failure, and were more confident, etc.. Hence during these four weeks of experiment time, there was one factor that has induced a positive change in the EG's affection with Dutch: they became less anxious and apprehensive and more acceptive and confident about Dutch learning. Since all other factors are the same for EG and the CG, they were following the same course, they had equal chance to communicate during the class, and they are in the similar age, etc., except that the EG participants were watching recreational videos in Dutch every week and the CG participants were avoiding watching recreational videos in Dutch. Thus it is reasonable to conclude that this positive change in the affection with Dutch (the decrease of Language Anxiety) is resulted from the recreational video watching. Moreover, the EG's decrease of Classroom Anxiety Scale is a compound result of the drop of five negative affections: lack of confidence, fear of failure, lack of eagerness to participate in speaking classes, competitiveness, perfectionism, and the none of these five negative affections have had a significant decrease according to the questionnaire result of the EG.

As for the Utterance Fluency, comparing to the CG, the EG's performance developed more rapidly, or deteriorated less, in 1 out of the 2 measures of Speed Fluency, 5 out of the 7 measures of Breakdown Fluency, and the 1 measure of Repair Fluency. These effects are highly likely to be caused by the EG's recreational video watching.

Hence there is a high possibility that even with the leisure mind set, watching videos in Dutch (with captions) could benefit the learners by making them more relaxed, less apprehensive, and more confident in a Dutch environment (suggested by the decrease of the Language Anxiety scales among the EG), and subconsciously more familiar with the language (suggested by both the reduction in Language Anxiety scales of the EG and the fact that comparing with the CG, the EG was making a more rapid progress on the Utterance Fluency, i.e. the EG participants were becoming less hesitant or inept in the utterance than the CG participants). So the adult Dutch learners could be suggested to watch recreational Dutch TV programs and movies in the leisure time, and ideally with captions, and a benefit from it can be expected in a relatively long term.

Although there are several flaws in this study experiment that might have had unknown influence on the result and conclusion:

- One participant from the CG refused to fill in the questionnaires, so there are only questionnaire data from the 6 participants in the CG.
- Several participants from both groups were absent for some class sessions, so the statistics based on the classroom recordings do not cover every participant's full performance during the four weeks.

- The first class session had a much lower difficulty than the rest, and there was no silent pause made by any of the participants, and this might have had an influence on the analysis of the Utterance Fluency development.
- In some class sessions, some participants had much less utterance, i.e. they talked much less, and this might have had an influence on the mean numbers of the Utterance Fluency measures: the numbers might be an accidental result of one or two pieces utterance rather than showing the participant's Utterance Fluency performance of this session fairly.
- Four weeks' experiment period might not be sufficient for some effects to be clearly and correctly manifested. For example, given a longer experiment period, the decrease of some of the aspects of Classroom Anxiety of the EG might be more significant, which would make the decrease in EG's Classroom Anxiety more explainable and clearer, and the effect might be significant enough to influence more measures of Utterance Fluency more clearly.
- The amount of participants, of the experiment,14, is relatively small, so it might not have demonstrated the effect fairly and there is a small chance that the results are accidental.
- Due to the nature of the course that it was a held in Delft University of Technology, all the participants are highly educated (bachelor or above) and have science, technology, or engineer related background, which might have influenced the result and conclusion of the research.

Due to all these flaws and limitations, further research and discussions are needed to reach more solid and generally applicable conclusions. Further, there are a number of related questions, such as how do different types of video materials influence adult foreign language learners differently, what is a best amount of exposure to optimize the effect, and what is a good starting point for learners to start watching, and these questions need to be answered by better structured and a longer running experiment on a much larger scale.

APPENDIX

TABLE II. BASIC PERSONAL INFORMATION OF PARTICIPANTS (PART 1)

Name	Lei Wei	Susana	Matas Ubaevicius	Will Anderson
Group	EG	EG	CG	CG
Age	25	46	27	39
Gender	M	F	M	M
Profession	PhD	ING	Architect	Engineer
University degrees & Major	Master of Applied Physics	Master of Refining Master of Finance	Master of Architecture	Msc Aeospace Engineer
Nationality	Chinese	Spanish	Litouws	USA
First language	Chinese	Spanish	Litouws	English
Other languages, level of them, and acquired time	English (fluent), Dutch (learning)	English (bi-lingual) Dutch (learning)	English (fluent)	German, C2, 12 years French, C3, 12 years Romanian, B2, 4 years
How long have you been in NL	5 years	1 year	3 years	5 months
Time spent on Delft Methode per week	10 hours	8-10 hours	10 hours	6 hours
time spent on Dutch other than Delftse Methode (including communicating with people in Dutch, reading, and writing in Dutch, excluding video watching from this experiment) per week	1 hour	none	10 hours	none
Motivation of Learning Dutch	culture	I am living in NL	Work	living in NL

TABLE III. BASIC PERSONAL INFORMATION OF PARTICIPANTS (PART 2)

Name	Olga Sheochuk	Thibault Decoster	Theodor Solis	Mona
Group	CG	CG	EG	EG
Age	24	29	31	33
Gender	F	M	M	F
Profession	PhD	Research Scientist	Researcher	Electronic Engineer
University degrees & Major	Msc Theoretical Physics	PhD in Physics	PhD of Biomedical Engineer	Master of Electronic Engineer
Nationality	Ukraine	French	Mexico	Iran
First language	Ukrainian, Russian	French	Spanish	Persian
Other languages, level of them, and acquired time	English, fluent, 10 years Chinese, Intermediate, 3 years	English (fluent) Spanish (4 years) Latin (3 years) Portuguese (0.5 year) German (0.5 year, self study)	English (good, 10 years) German (average, 2 years)	English (Average)
How long have you been in NL	5 years	2 years	8 months	3 years
Time spent on Delft Methode per week	12 hours	10 hours	5 hours	6 hours
time spent on Dutch other	2 hours	1 hour	none	none

than Delft Methode (including communicating with people in Dutch, reading, and writing in Dutch, excluding video watching from this experiment) per week				
Motivation of Learning Dutch	Dutch Nationality	Learn a Germanic language	hobby	to speak

TABLE IV. BASIC PERSONAL INFORMATION OF PARTICIPANTS (PART 3)

Name	Niki	Yufei	Eva Delincakova
Group	CG	CG	EG
Age	24	30	27
Gender	F	M	F
Profession	Student	Researcher	Student
University degrees & Major	Master of Electrical Power Engineering	PhD in Traffic & Transport	Master of Arts in Computer Animation Bc in Marketing Communication
Nationality	Greek	Chinese	Slovak
First language	Greek	Chinese	Slovak
Other languages, level of them, and acquired time	English C2 German B2 French B1	English, good	French, good English, very good Czech, very good
How long have you been in NL	8 months	8 years	2.5 years
Time spent on Delft Methode per week	4 hours	6 hours	2 hours
time spent on Dutch other than Delft Methode (including communicating with people in Dutch, reading, and writing in Dutch, excluding video watching from this experiment) per week	none	1 hour	1 hour
Motivation of Leraning Dutch	hobby	hobby	understand people and culture where I live

TABLE V. BASIC PERSONAL INFORMATION OF PARTICIPANTS (PART 4)

Name	Markus Malkki	Katerina Stamat	Ashim Giyanani
Group	EG	EG	CG
Age	23	26	30
Gender	M	F	M
Profession	Student	Architect	PhD
University degrees & Major	Bachelor of Science Naval Architecture	Master of Architect	MSc Wind Engineering
Nationality	Finnish	Greek	Indian
First language	Finnish	Greek	Sindhi
Other languages, level of them, and acquired time	Dutch, basic/intermediate English, good Swedish, intermediate German, intermediate	English, fluent French, B2 Italian, B2 Dutch, intermediate	Marathi, good Gujarati, good) English, fluent German, fluent
How long have you been in NL	10 months	11 months	6 months
Time spent on Delft Methode per week	4 hours	6 hours	4 hours
time spent on Dutch other than Delft Methode (including communicating with people in Dutch, reading, and writing in Dutch, excluding video watching from this experiment) per week	2 hours	1 hour	2 hours
Motivation of Learning Dutch	When in any country, learn the language. I also have spoken Dutch as a kid so I wanted to learn it again.	Working in NL	To speak the native language of where i live

TABLE VI. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 1 (PART 1)

Category	Metric	session 1					session 2							session 3								
	number of syllables	8	22	64	42	37	30	32	8	15	29	9	31	7	15	49	43	42	120	61	110	38
	number of silent pauses	0	0	0	0	0	1	0	0	1	2	0	0	0	0	1	3	3	10	1	7	2
	total duration (s)	2.31	5.42	17.15	11.87	7.09	8.95	10.17	2.42	4.98	9.42	2.99	8.63	2.1	3.43	11.82	13.28	10.83	32.12	14.2	32.53	9.83
	phonation time (s)	2.31	5.42	17.15	11.87	7.09	8.48	9.89	2.06	4.4	8.42	2.99	8.63	2.1	3.43	10.81	11.27	9	26.72	13.7	28.12	8.68
	speech rate	3.46	4.06	3.73	3.54	5.22	3.35	3.15	3.31	3.01	3.08	3.01	3.59	3.33	4.37	4.15	3.24	3.88	3.74	4.3	3.38	3.86
	articulation rate	3.46	4.06	3.73	3.54	5.22	3.54	3.23	3.89	3.41	3.44	3.01	3.59	3.33	4.37	4.53	3.82	4.67	4.49	4.45	3.91	4.38
	ASD	0.289	0.246	0.268	0.283	0.192	0.283	0.309	0.257	0.293	0.29	0.332	0.278	0.3	0.229	0.221	0.262	0.214	0.223	0.225	0.256	0.228
	number of repairs	0	0	1	2	1	1	1	0	0	3	0	0	0	0	1	1	3	4	3	2	1
Speed Fluency	Speech rate (syllables divided per total time)	3.46	4.06	3.73	3.54	5.22	3.35	3.15	3.31	3.01	3.08	3.01	3.59	3.33	4.37	4.15	3.24	3.88	3.74	4.3	3.38	3.86
	Mean speech rate of the session	3.946167883					3.238015139							3.726755801								
	Articulation rate (syllables divided by phonation time)	3.46	4.06	3.73	3.54	5.22	3.54	3.23	3.89	3.41	3.44	3.01	3.59	3.33	4.37	4.53	3.82	4.67	4.49	4.45	3.91	4.38
	Mean articulation rate of the session	3.946167883					3.432137285							4.2607397								
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	8	22	64	42	37	15	32	8	7.5	9.666	9	31	7	15	24.5	10.75	10.5	10.90	30.5	13.75	12.66
	Mean length of utterance of the session (in syllables)	34.6					14							13.47222222								
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.31	5.42	17.15	11.87	7.09	4.24	9.89	2.06	2.2	2.806	2.99	8.63	2.1	3.43	5.405	2.817	2.25	2.429	6.85	3.515	2.893
	Mean length of utterance of the session (in seconds)	8.768					4.079090909							3.161944444								
	Number of pauses per second (total time)	0	0	0	0	0	0.111	0	0	0.200	0.212	0	0	0	0	0.084	0.225	0.277	0.311	0.070	0.215	0.203
	Mean number of pauses per second per session (total time)	0					0.08410428932							0.2074688797								
	Number of pauses per second (speaking time)	0	0	0	0	0	0.117	0	0	0.227	0.237	0	0	0	0	0.092	0.266	0.333	0.374	0.072	0.248	0.230
	Mean number of pauses per second per session (speaking time)	0					0.089146423							0.2371958183								
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0	0.235	0.28	0.36	0.29	0.333	0	0	0	0	0.505	0.502	0.457	0.490	0.25	0.551	0.383
	Mean pause duration of the session	0					0.2445454545							0.4530555556								
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	1	0.947	0.972	0.851	0.883	0.893	1	1	1	1	0.914	0.848	0.831	0.831	0.964	0.864	0.883
	Mean phonation time ratio per session	1					0.9434398654							0.8746734286								
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	8	22	64	42	37	15	32	8	7.5	9.666	9	31	7	15	24.5	10.75	10.5	10.90	30.5	13.75	12.66
	Mean length of runs per session	34.6					14							13.47222222								
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.058	0.168	0.141	0.117	0.101	0	0	0.356	0	0	0	0	0.092	0.088	0.333	0.149	0.218	0.071	0.115
	Mean number of repairs per second per session (phonation time)	0.09124087591					0.1114330287							0.1317754546								

TABLE VII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 1 (PART 2)

Category	Metric	session 4				session 5								
	number of syllables	22	43	87	43	59	42	56	59	72	29	88	126	64
	number of silent pauses	0	6	11	0	2	0	3	4	3	0	2	8	1
	total duration (s)	6.78	14.25	29.95	9.57	13.33	10.57	17.1	16.23	17.15	6.23	22.82	31.65	15.69
	phonation time (s)	6.78	10.13	23.47	9.31	12.79	10.57	14.81	14.2	16.09	6.23	22.22	28.33	15.38
	speech rate	3.25	3.02	2.91	4.49	4.42	3.98	3.28	3.63	4.2	4.66	3.86	3.98	4.08
	articulation rate	3.25	4.24	3.71	4.62	4.61	3.98	3.78	4.16	4.47	4.66	3.96	4.45	4.16
	ASD	0.308	0.236	0.27	0.217	0.217	0.252	0.264	0.241	0.224	0.215	0.253	0.225	0.24
	number of repairs	0	1	2	1	2	2	2	2	1	1	1	3	1
Speed Fluency	Speech rate (syllables divided per total time)	3.25	3.02	2.91	4.49	4.42	3.98	3.28	3.63	4.2	4.66	3.86	3.98	4.08
	Mean speech rate of the session	3.220478943				4.329161816								
	Articulation rate (syllables divided by phonation time)	3.25	4.24	3.71	4.62	4.61	3.98	3.78	4.16	4.47	4.66	3.96	4.45	4.16
	Mean articulation rate of the session	3.924330851				5.074194099								
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	22	6.1428	7.25	43	19.66	42	14	11.8	18	29	29.33	14	32
	Mean length of utterance of the session (in syllables)	9.285714286				18.59375								
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	6.78	1.4471	1.9558	9.31	4.263	10.57	3.702	2.84	4.022	6.23	7.406	3.147	7.69
	Mean length of utterance of the session (in seconds)	2.366190476				3.664375								
	Number of pauses per second (total time)	0	0.4210	0.3672	0	0.150	0	0.175	0.246	0.174	0	0.087	0.252	0.063
	Mean number of pauses per second per session (total time)	0.2807597027				0.1673457509								
	Number of pauses per second (speaking time)	0	0.5923	0.4686	0	0.156	0	0.202	0.281	0.186	0	0.090	0.282	0.065
	Mean number of pauses per second per session (speaking time)	0.3421211511				0.1961453181								
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.5885	0.54	0.26	0.18	0	0.572	0.406	0.265	0	0.2	0.368	0.155
	Mean pause duration of the session	0.5171428571				0.630625								
	Phonation time ratio (phonation time divided by total time)	1	0.7108	0.7836	0.9728	0.959	1	0.866	0.874	0.938	1	0.973	0.895	0.980
	Mean phonation time ratio per session	0.8206440958				0.8531722934								
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	22	6.1428	7.25	43	19.66	42	14	11.8	18	29	29.33	14	32
	Mean length of runs per session	9.285714286				18.59375								
Repair Fluency	Number of repairs per second (phonation time)	0	0.0987	0.0852	0.1074	0.156	0.189	0.135	0.140	0.124	0.160	0.045	0.105	0.065
	Mean number of repairs per second per session (phonation time)	0.08049909439				0.1364489169								

TABLE VIII.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 1 (PART 3)

		session 4				session 5								
	number of syllables	22	43	87	43	59	42	56	59	72	29	88	126	64
	number of silent pauses	0	6	11	0	2	0	3	4	3	0	2	8	1
	total duration (s)	6.78	14.25	29.95	9.57	13.33	10.57	17.1	16.23	17.15	6.23	22.82	31.65	15.69
	phonation time (s)	6.78	10.13	23.47	9.31	12.79	10.57	14.81	14.2	16.09	6.23	22.22	28.33	15.38
	speech rate	3.25	3.02	2.91	4.49	4.42	3.98	3.28	3.63	4.2	4.66	3.86	3.98	4.08
	articulation rate	3.25	4.24	3.71	4.62	4.61	3.98	3.78	4.16	4.47	4.66	3.96	4.45	4.16
	ASD	0.308	0.236	0.27	0.217	0.217	0.252	0.264	0.241	0.224	0.215	0.253	0.225	0.24
	number of repairs	0	1	2	1	2	2	2	2	2	1	1	3	1
Speed Fluency	Speech rate (syllables divided per total time)	3.25	3.02	2.91	4.49	4.42	3.98	3.28	3.63	4.2	4.66	3.86	3.98	4.08
	Mean speech rate of the session	3.220478943				4.329161816								
	Articulation rate (syllables divided by phonation time)	3.25	4.24	3.71	4.62	4.61	3.98	3.78	4.16	4.47	4.66	3.96	4.45	4.16
	Mean articulation rate of the session	3.924330851				5.074194099								
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	22	6.1428	7.25	43	19.66	42	14	11.8	18	29	29.33	14	32
	Mean length of utterance of the session (in syllables)	9.285714286				18.59375								
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	6.78	1.4471	1.9558	9.31	4.263	10.57	3.702	2.84	4.022	6.23	7.406	3.147	7.69
	Mean length of utterance of the session (in seconds)	2.366190476				3.664375								
	Number of pauses per second (total time)	0	0.4210	0.3672	0	0.150	0	0.175	0.246	0.174	0	0.087	0.252	0.063
	Mean number of pauses per second per session (total time)	0.2807597027				0.1673457509								
	Number of pauses per second (speaking time)	0	0.5923	0.4686	0	0.156	0	0.202	0.281	0.186	0	0.090	0.282	0.065
	Mean number of pauses per second per session (speaking time)	0.3421211511				0.1961453181								
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.5885	0.54	0.26	0.18	0	0.572	0.406	0.265	0	0.2	0.368	0.155
	Mean pause duration of the session	0.5171428571				0.630625								
	Phonation time ratio (phonation time divided by total time)	1	0.7108	0.7836	0.9728	0.959	1	0.866	0.874	0.938	1	0.973	0.895	0.980
	Mean phonation time ratio per session	0.8206440958				0.8531722934								
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	22	6.1428	7.25	43	19.66	42	14	11.8	18	29	29.33	14	32
	Mean length of runs per session	9.285714286				18.59375								
Repair Fluency	Number of repairs per second (phonation time)	0	0.0987	0.0852	0.1074	0.156	0.189	0.135	0.140	0.124	0.160	0.045	0.105	0.065
	Mean number of repairs per second per session (phonation time)	0.08049909439				0.1364489169								

TABLE IX.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 1 (PART 4)

		session6	session7	session8
	number of syllables	/	25	19
	number of silent pauses	/	1	0
	total duration (s)	/	7.22	4.48
	phonation time (s)	/	6.73	4.48
	speech rate	/	3.46	4.24
	articulation rate	/	3.72	4.24
	ASD	/	0.269	0.236
	number of repairs	/	0	0
Speed Fluency	Speech rate (syllables divided per total time)	/	3.46	4.24
	Mean speech rate of the session	/	3.46	4.24
	Articulation rate (syllables divided by phonation time)	/	3.72	4.24
	Mean articulation rate of the session	/	3.72	4.24
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	/	12.5	19
	Mean length of utterance of the session (in syllables)	/	12.5	19
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	/	3.365	4.48
	Mean length of utterance of the session (in seconds)	/	3.365	4.48
	Number of pauses per second (total time)	/	0.138504	0
	Mean number of pauses per second per session (total time)	/	0.1385	0
	Number of pauses per second (speaking time)	/	0.148588	0
	Mean number of pauses per second per session (speaking time)	/	0.1485	0
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	/	0.245	0
	Mean pause duration of the session	/	0.245	0
	Phonation time ratio (phonation time divided by total time)	/	0.932132	1
	Mean phonation time ratio per session	/	0.9321	1
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	/	12.5	19
	Mean length of runs per session	/	12.5	19
Repair Fluency	Number of repairs per second (phonation time)	/	0	0
	Mean number of repairs per second per session (phonation time)	/	0	0

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TABLE X. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 2 (PART 1)

		session1	session 2								session3
	number of syllables	/	34	23	11	17	5	6	27	17	/
	number of silent pauses	/	0	0	0	2	0	0	1	0	/
	total duration (s)	/	6.39	4.98	2.96	4.64	1.55	1.71	6.75	3.49	/
	phonation time (s)	/	6.39	4.98	2.96	3.98	1.55	1.71	5.8	3.49	/
	speech rate	/	5.32	4.62	3.71	3.67	3.22	3.51	4	4.88	/
	articulation rate	/	5.32	4.62	3.71	4.27	3.22	3.51	4.66	4.88	/
	ASD	/	0.188	0.216	0.269	0.234	0.311	0.285	0.215	0.205	/
	number of repairs	/	0	2	0	1	0	0	0	2	/
Speed Fluency	Speech rate (syllables divided per total time)	/	5.32	4.62	3.71	3.67	3.22	3.51	4	4.88	/
	Mean speech rate of the session	/	4.311672313								/
	Articulation rate (syllables divided by phonation time)	/	5.32	4.62	3.71	4.27	3.22	3.51	4.66	4.88	/
	Mean articulation rate of the session	/	4.53661698								/
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	/	34	23	11	5.6666	5	6	13.5	17	/
	Mean length of utterance of the session (in syllables)	/	12.72727273								/
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	/	6.39	4.98	2.96	1.3266	1.55	1.71	2.9	3.49	/
	Mean length of utterance of the session (in seconds)	/	2.805454545								/
	Number of pauses per second (total time)	/	0	0	0	0.4310	0	0	0.1481	0	/
	Mean number of pauses per second per session (total time)	/	0.09239297813								/
	Number of pauses per second (speaking time)	/	0	0	0	0.5025	0	0	0.1724	0	/
	Mean number of pauses per second per session (speaking time)	/	0.097213221								/
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	/	0	0	0	0.22	0	0	0.475	0	/
	Mean pause duration of the session	/	0.1463636364								/
	Phonation time ratio (phonation time divided by total time)	/	1	1	1	0.8577	1	1	0.8592	1	/
	Mean phonation time ratio per session	/	0.9504157684								/
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	/	34	23	11	5.6666	5	6	13.5	17	/
	Mean length of runs per session	/	12.72727273								/
Repair Fluency	Number of repairs per second (phonation time)	/	0	0.4016	0	0.2512	0	0	0	0.5730	/
	Mean number of repairs per second per session (phonation time)	/	0.162022035								/

TABLE XI. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 2 (PART 2)

		session 4					session 5				session6	session7	session8
	number of syllables	27	25	7	16	9	13	27	29	53	/	/	/
	number of silent pauses	0	1	0	0	0	0	1	0	2	/	/	/
	total duration (s)	5.89	5.81	2.39	3.09	2.65	2.15	7.22	5.81	11.35	/	/	/
	phonation time (s)	5.89	4.66	2	3.09	2.65	2.15	6.81	5.81	10.73	/	/	/
	speech rate	4.58	4.3	2.93	5.17	3.4	6.04	3.74	4.99	4.67	/	/	/
	articulation rate	4.58	5.37	3.5	5.17	3.4	6.04	3.97	4.99	4.94	/	/	/
	ASD	0.218	0.186	0.286	0.193	0.294	0.166	0.252	0.2	0.202	/	/	/
	number of repairs	0	0	0	0	0	0	0	1	0	/	/	/
Speed Fluency	Speech rate (syllables divided per total time)	4.58	4.3	2.93	5.17	3.4	6.04	3.74	4.99	4.67	/	/	/
	Mean speech rate of the session	4.236006051					4.598567659				/	/	/
	Articulation rate (syllables divided by phonation time)	4.58	5.37	3.5	5.17	3.4	6.04	3.97	4.99	4.94	/	/	/
	Mean articulation rate of the session	4.592673592					5.2248394				/	/	/
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	27	12.5	7	16	9	13	13.5	29	17.666	/	/	/
	Mean length of utterance of the session (in syllables)	14					17.42857143				/	/	/
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.89	2.33	2	3.09	2.65	2.15	3.405	5.81	3.5766	/	/	/
	Mean length of utterance of the session (in seconds)	3.048333333					3.335714286				/	/	/
	Number of pauses per second (total time)	0	0.1721	0	0	0	0	0.1388	0	0.1762	/	/	/
	Mean number of pauses per second per session (total time)	0.05042864347					0.1130795326				/	/	/
	Number of pauses per second (speaking time)	0	0.2145	0	0	0	0	0.1468	0	0.1863	/	/	/
	Mean number of pauses per second per session (speaking time)	0.05467468562					0.1284796574				/	/	/
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.575	0.39	0	0	0	0.205	0	0.2066	/	/	/
	Mean pause duration of the session	0.2566666667					0.4542857143				/	/	/
	Phonation time ratio (phonation time divided by total time)	1	0.8020	0.8368	1	1	1	0.9432	1	0.9453	/	/	/
	Mean phonation time ratio per session	0.9223398891					0.8801356954				/	/	/
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	27	12.5	7	16	9	13	13.5	29	17.666	/	/	/
	Mean length of runs per session	14					17.42857143				/	/	/
Repair Fluency	Number of repairs per second (phonation time)	0	0	0	0	0	0	0	0.172	0	/	/	/
	Mean number of repairs per second per session (phonation time)	0					0.04282655246				/	/	/

TABLE XII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 3 (PART 1)

		session1	session 2						session 3									session 4	
	number of syllables	20	68	49	14	79	86	50	13	26	43	11	28	15	24	115	43	15	16
	number of silent pauses	0	1	1	0	7	8	2	0	4	1	0	0	0	0	9	4	0	0
	total duration (s)	5.99	15.37	9.23	3.12	21.88	21.12	9.86	3.43	7.2	9.29	2.89	5.39	3.85	6.02	28.56	9.81	3.17	4.22
	phonation time (s)	5.99	14.99	8.93	3.12	18.05	18.06	9.04	3.43	5.72	8.89	2.89	5.39	3.27	6.02	24.37	8.32	3.17	4.22
	speech rate	3.34	4.42	5.31	4.49	3.61	4.07	5.07	3.79	3.61	4.63	3.81	5.19	3.89	3.99	4.03	4.38	4.73	3.79
	articulation rate	3.34	4.54	5.49	4.49	4.38	4.76	5.53	3.79	4.54	4.84	3.81	5.19	4.59	3.99	4.72	5.17	4.73	3.79
	ASD	0.3	0.22	0.182	0.223	0.229	0.21	0.181	0.264	0.22	0.207	0.262	0.193	0.218	0.251	0.212	0.193	0.212	0.264
	number of repairs	1	1	2	2	5	4	1	1	2	2	0	1	1	0	1	0	1	1
Speed Fluency	Speech rate (syllables divided per total time)	3.34	4.42	5.31	4.49	3.61	4.07	5.07	3.79	3.61	4.63	3.81	5.19	3.89	3.99	4.03	4.38	4.73	3.79
	Mean speech rate of the session	3.34	4.293869447						4.160125589									4.194857916	
	Articulation rate (syllables divided by phonation time)	3.34	4.54	5.49	4.49	4.38	4.76	5.53	3.79	4.54	4.84	3.81	5.19	4.59	3.99	4.72	5.17	4.73	3.79
	Mean articulation rate of the session	3.34	4.792907605						4.902111916									4.194857916	
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	20	34	24.5	14	9.875	9.555	16.66	13	5.2	21.5	11	28	15	24	11.5	8.6	15	16
	Mean length of utterance of the session (in syllables)	20	13.84						11.77777778									15.5	
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.99	7.495	4.465	3.12	2.256	2.006	3.013	3.43	1.144	4.445	2.89	5.39	3.27	6.02	2.437	1.664	3.17	4.22
	Mean length of utterance of the session (in seconds)	5.99	2.8876						2.402592593									3.695	
	Number of pauses per second (total time)	0	0.065	0.108	0	0.319	0.378	0.202	0	0.555	0.107	0	0	0	0	0.315	0.407	0	0
	Mean number of pauses per second per session (total time)	0	0.2357905187						0.2354788069									0	
	Number of pauses per second (speaking time)	0	0.066	0.111	0	0.387	0.442	0.221	0	0.699	0.112	0	0	0	0	0.369	0.480	0	0
	Mean number of pauses per second per session (speaking time)	0	0.2631943482						0.277478033									0	
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.19	0.15	0	0.478	0.34	0.273	0	0.296	0.2	0	0	0.58	0	0.419	0.298	0	0
	Mean pause duration of the session	0	0.3356						0.4285185185									0	
	Phonation time ratio (phonation time divided by total time)	1	0.975	0.967	1	0.824	0.855	0.916	1	0.794	0.956	1	1	0.849	1	0.853	0.848	1	1
	Mean phonation time ratio per session	1	0.8958798709						0.8486394558									1	
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	20	0.066	0.111	0	0.387	0.442	0.221	0	0.699	0.112	0	0	0	0	0.369	0.480	0	0
	Mean length of runs per session	20	13.84						11.77777778									15.5	
Repair Fluency	Number of repairs per second (phonation time)	0.166944	0.066	0.223	0.641	0.277	0.221	0.110	0.291	0.349	0.224	0	0.185	0.305	0	0.041	0	0.315	0.236
	Mean number of repairs per second per session (phonation time)	0.167	0.2077850118						0.1233235702									0.2706359946	

TABLE XIII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 3 (PART 2)

		session 5				session 6							ession	session 8			
	number of syllables	123	27	23	59	15	18	54	34	54	17	90	/	18	35	19	46
	number of silent pauses	0	0	0	2	0	0	4	2	5	1	3	/	0	2	2	0
	total duration (s)	21.35	5.97	6.15	14.61	2.89	5.65	14.48	10.3	14.14	5.37	19.76	/	4.32	8.61	5.39	9.44
	phonation time (s)	21.35	5.97	6.15	13.32	2.42	5.65	12.02	8.77	11.84	4.69	18.64	/	4.32	7.84	4.29	9.44
	speech rate	5.76	4.52	3.74	4.04	5.2	3.18	3.73	3.3	3.82	3.17	4.55	/	4.16	4.07	3.52	4.87
	articulation rate	5.76	4.52	3.74	4.43	6.2	3.18	4.49	3.88	4.56	3.62	4.83	/	4.16	4.47	4.43	4.87
	ASD	0.174	0.221	0.267	0.226	0.161	0.314	0.223	0.258	0.219	0.276	0.207	/	0.24	0.224	0.226	0.205
	number of repairs	1	0	1	2	0	1	2	1	2	1	4	/	0	0	0	0
Speed Fluency	Speech rate (syllables divided per total time)	5.76	4.52	3.74	4.04	5.2	3.18	3.73	3.3	3.82	3.17	4.55	/	4.16	4.07	3.52	4.87
	Mean speech rate of the session	4.825291181				3.884832622							/	4.250720461			
	Articulation rate (syllables divided by phonation time)	5.76	4.52	3.74	4.43	6.2	3.18	4.49	3.88	4.56	3.62	4.83	/	4.16	4.47	4.43	4.87
	Mean articulation rate of the session	4.958324428				4.404185538							/	4.557744303			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	123	27	23	19.66	15	18	10.8	11.33	9	8.5	22.5	/	18	11.666	6.3333	46
	Mean length of utterance of the session (in syllables)	38.66666667				12.81818182							/	14.75			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	21.35	5.97	6.15	4.44	2.42	5.65	2.404	2.923	1.973	2.345	4.66	/	4.32	2.613	1.43	9.44
	Mean length of utterance of the session (in seconds)	7.798333333				2.910454545							/	3.23625			
	Number of pauses per second (total time)	0	0	0	0.136	0	0	0.276	0.194	0.353	0.186	0.151	/	0	0.232	0.371	0
	Mean number of pauses per second per session (total time)	0.04159733777				0.2066400331							/	0.144092219			
	Number of pauses per second (speaking time)	0	0	0	0.150	0	0	0.332	0.228	0.422	0.213	0.160	/	0	0.255	0.466	0
	Mean number of pauses per second per session (speaking time)	0.04274417611				0.2342651882							/	0.1544998069			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0.43	0.47	0	0.492	0.51	0.383	0.34	0.28	/	0	0.256	0.366	0
	Mean pause duration of the session	0.215				0.3890909091							/	0.23375			
	Phonation time ratio (phonation time divided by total time)	1	1	1	0.911	0.837	1	0.830	0.854	0.837	0.873	0.943	/	1	0.910	0.795	1
	Mean phonation time ratio per session	0.9731697171				0.8820774211							/	0.9326368876			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	0	0	0	0.150	0	0	0.332	0.228	0.422	0.213	0.160	/	0	0.255	0.466	0
	Mean length of runs per session	38.66666667				12.81818182							/	14.75			
Repair Fluency	Number of repairs per second (phonation time)	0.046	0	0.162	0.150	0	0.176	0.166	0.114	0.168	0.213	0.214	/	0	0	0	0
	Mean number of repairs per second per session (phonation time)	0.08548835221				0.1717944713							/	0			

TABLE XIV. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 4 (PART 1)

		session1	session 2		session3	session 4				session 5		
	speech rate	3.97	4.77	3.86	/	3.2	3.55	2.99	3.95	3.88	4.27	3.19
	articulation rate	3.97	4.77	3.86	/	3.2	3.55	2.99	3.95	3.88	4.69	3.29
	ASD	0.252	0.21	0.259	/	0.312	0.281	0.334	0.253	0.258	0.213	0.304
	number of repairs	0	1	1	/	0	0	0	0	0	1	0
Speed Fluency	Speech rate (syllables divided per total time)	3.97	4.77	3.86	/	3.2	3.55	2.99	3.95	3.88	4.27	3.19
	Mean speech rate of the session	3.97	4.161849711		/	3.27014218				3.663500678		
	Articulation rate (syllables divided by phonation time)	3.97	4.77	3.86	/	3.2	3.55	2.99	3.95	3.88	4.69	3.29
	Mean articulation rate of the session	3.97	4.161849711		/	3.27014218				3.781512605		
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	7	14	22	/	11	20	30	8	32	9.5	15
	Mean length of utterance of the session (in syllables)	7	18		/	17.25				16.2		
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	1.76	2.94	5.71	/	3.43	5.63	10.02	2.02	8.24	2.025	4.565
	Mean length of utterance of the session (in seconds)	1.76	4.325		/	5.275				4.284		
	Number of pauses per second (total time)	0	0	0	/	0	0	0	0	0	0.224	0.106
	Mean number of pauses per second per session (total time)	0	0		/	0				0.09045680687		
	Number of pauses per second (speaking time)	0	0	0	/	0	0	0	0	0	0.246	0.109
	Mean number of pauses per second per session (speaking time)	0	0		/	0				0.09337068161		
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	/	0	0	0	0	0	0.2	0.145
	Mean pause duration of the session	0	0		/	0				0.138		
	Phonation time ratio (phonation time divided by total time)	1	1	1	/	1	1	1	1	1	0.910	0.969
	Mean phonation time ratio per session	1	1		/	1				0.9687924016		
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	7	14	22	/	11	20	30	8	32	9.5	15
	Mean length of runs per session	7	18		/	17.25				16.2		
Repair Fluency	Number of repairs per second (phonation time)	0	0.340	0.175	/	0	0	0	0	0	0.246	0
	Mean number of repairs per second per session (phonation time)	0	0.231213872		/	0				0.0466853408		

TABLE XV. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 4 (PART 2)

		session6	session 7				session 8		
	speech rate	3.82	3.05	2.37	2.93	2.34	3	2.01	2.17
	articulation rate	3.82	3.35	3.23	3.59	2.34	3	2.3	3.69
	ASD	0.262	0.299	0.31	0.279	0.428	0.334	0.435	0.271
	number of repairs	0	0	1	0	0	0	0	0
Speed Fluency	Speech rate (syllables divided per total time)	3.82	3.05	2.37	2.93	2.34	3	2.01	2.17
	Mean speech rate of the session	3.82	2.643504532				2.223634053		
	Articulation rate (syllables divided by phonation time)	3.82	3.35	3.23	3.59	2.34	3	2.3	3.69
	Mean articulation rate of the session	3.82	3.15694528				2.859477124		
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	24	11.666	4.3333	4.25	14	7	3.5	3.5
	Mean length of utterance of the session (in syllables)	24	6.176470588				3.888888889		
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	6.28	3.4866	1.3411	1.185	5.99	2.34	1.525	0.95
	Mean length of utterance of the session (in seconds)	6.28	1.956470588				1.36		
	Number of pauses per second (total time)	0	0.1742	0.4866	0.5163	0	0	0.4310	0.4658
	Mean number of pauses per second per session (total time)	0	0.3272910373				0.3811944091		
	Number of pauses per second (speaking time)	0	0.1912	0.6628	0.6329	0	0	0.4918	0.7894
	Mean number of pauses per second per session (speaking time)	0	0.3908598918				0.4901960784		
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.34	0.4855	0.2675	0	0	0.215	0.66
	Mean pause duration of the session	0	0.38				0.3888888889		
	Phonation time ratio (phonation time divided by total time)	1	0.9111	0.7341	0.8158	1	1	0.8764	0.5900
	Mean phonation time ratio per session	1	0.8373615307				0.7776365947		
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	24	11.666	4.3333	4.25	14	7	3.5	3.5
	Mean length of runs per session	24	6.176470588				3.888888889		
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.0828	0	0	0	0	0
	Mean number of repairs per second per session (phonation time)	0	0.03006614552				0		

TABLE XVI. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 5 (PART 1)

		session 1		session 2		session3	session 4					
	number of syllables	26	50	32	17	/	48	44	28	44	47	59
	number of silent pauses	0	0	1	0	/	2	1	1	3	1	6
	total duration (s)	5.65	12	8.45	3.62	/	12.21	9.76	6.96	10.64	13.62	13.8
	phonation time (s)	5.65	12	7.99	3.62	/	10.87	9.11	6.67	9.48	13.25	11.47
	speech rate	4.6	4.17	3.79	4.7	/	3.93	4.51	4.02	4.13	3.45	4.27
	articulation rate	4.6	4.17	4.01	4.7	/	4.42	4.83	4.2	4.64	3.55	5.14
	ASD	0.217	0.24	0.25	0.213	/	0.226	0.207	0.238	0.215	0.282	0.194
	number of repairs	2	1	1	0	/	1	2	0	0	1	1
Speed Fluency	Speech rate (syllables divided per total time)	4.6	4.17	3.79	4.7	/	3.93	4.51	4.02	4.13	3.45	4.27
	Mean speech rate of the session	4.30594900		4.05965203		/	4.030452306					
	Articulation rate (syllables divided by phonation time)	4.6	4.17	4.01	4.7	/	4.42	4.83	4.2	4.64	3.55	5.14
	Mean articulation rate of the session	4.30594900		4.22049956		/	4.437140509					
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	26	50	16	17	/	16	22	14	11	23.5	8.4285
	Mean length of utterance of the session (in syllables)	38		16.3333333		/	13.5					
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.65	12	3.995	3.62	/	3.6233	4.555	3.335	2.37	6.625	1.6385
	Mean length of utterance of the session (in seconds)	8.825		3.87		/	3.0425					
	Number of pauses per second (total time)	0	0	0.118	0	/	0.1638	0.1024	0.1436	0.2819	0.0734	0.4347
	Mean number of pauses per second per session (total time)	0		0.08285004		/	0.2089864159					
	Number of pauses per second (speaking time)	0	0	0.125	0	/	0.1839	0.1097	0.1499	0.3164	0.0754	0.5231
	Mean number of pauses per second per session (speaking time)	0		0.08613264		/	0.2300739523					
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0.23	0	/	0.4466	0.325	0.145	0.29	0.185	0.3328
	Mean pause duration of the session	0		0.15333333		/	0.307					
	Phonation time ratio (phonation time divided by total time)	1	1	0.945	1	/	0.8902	0.9334	0.9583	0.8909	0.9728	0.8311
	Mean phonation time ratio per session	1		0.96188898		/	0.908344529					
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	26	50	16	17	/	16	22	14	11	23.5	8.4285
	Mean length of runs per session	38		16.3333333		/	13.5					
Repair Fluency	Number of repairs per second (phonation time)	0.353	0.083	0.125	0	/	0.0919	0.2195	0	0	0.0754	0.0871
	Mean number of repairs per second per session (phonation time)	0.16997167		0.08613264		/	0.08216926869					

TABLE XVII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 5 (PART 2)

		session 5				session 6			session 7			session8
	number of syllables	19	97	84	48	48	36	53	57	33	37	/
	number of silent pauses	0	1	4	0	3	1	3	3	3	0	/
	total duration (s)	4.92	21.64	20.57	10.7	14.17	8.48	12.66	14.43	7.67	8.97	/
	phonation time (s)	4.92	21.37	17.91	10.39	13.13	8.08	11.14	12.82	6.45	8.97	/
	speech rate	3.86	4.48	4.08	4.49	3.39	4.25	4.19	3.95	4.3	4.12	/
	articulation rate	3.86	4.54	4.69	4.62	3.66	4.46	4.76	4.45	5.12	4.12	/
	ASD	0.259	0.22	0.213	0.216	0.274	0.224	0.21	0.225	0.195	0.242	/
	number of repairs	1	0	0	1	1	0	0	2	0	0	/
Speed Fluency	Speech rate (syllables divided per total time)	3.86	4.48	4.08	4.49	3.39	4.25	4.19	3.95	4.3	4.12	/
	Mean speech rate of the session	4.28843161				3.879920702			4.087544255			/
	Articulation rate (syllables divided by phonation time)	3.86	4.54	4.69	4.62	3.66	4.46	4.76	4.45	5.12	4.12	/
	Mean articulation rate of the session	4.542956585				4.234930448			4.497167139			/
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	19	48.5	16.8	48	12	18	13.25	14.25	8.25	37	/
	Mean length of utterance of the session (in syllables)	27.55555556				13.7			14.11111111			/
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	4.92	10.68	3.582	10.39	3.2825	4.04	2.785	3.205	1.6125	8.97	/
	Mean length of utterance of the session (in seconds)	6.065555556				3.235			3.137777778			/
	Number of pauses per second (total time)	0	0.046	0.194	0	0.2117	0.1179	0.2369	0.2079	0.391	0	/
	Mean number of pauses per second per session (total time)	0.08646031472				0.1982441235			0.193112327			/
	Number of pauses per second (speaking time)	0	0.046	0.223	0	0.2284	0.1237	0.2692	0.234	0.465	0	/
	Mean number of pauses per second per session (speaking time)	0.09159186664				0.2163833076			0.2124645892			/
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.135	0.532	0.31	0.26	0.2	0.38	0.4025	0.305	0	/
	Mean pause duration of the session	0.36				0.296			0.3144444444			/
	Phonation time ratio (phonation time divided by total time)	1	0.987	0.870	0.971	0.9266	0.9528	0.8799	0.888	0.8409	1	/
	Mean phonation time ratio per session	0.9439737161				0.9161710564			0.9089153524			/
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	19	48.5	16.8	48	12	18	13.25	14.25	8.25	37	/
	Mean length of runs per session	27.55555556				13.7			14.11111111			/
Repair Fluency	Number of repairs per second (phonation time)	0.203	0	0	0.096	0.0761	0	0	0.156	0	0	/
	Mean number of repairs per second per session (phonation time)	0.03663674666				0.03091190108			0.07082152975			/

TABLE XVIII.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 6 (PART 1)

		session 1				session 2						
	number of syllables	18	18	21	60	32	14	56	20	43	30	41
	number of silent pauses	0	0	0	0	1	0	7	2	4	0	6
	total duration (s)	4.17	4.22	6.78	12.13	6.83	3.64	15.69	5.89	12.05	5.6	13.62
	phonation time (s)	4.17	4.22	6.78	12.13	6.13	3.27	12.73	4.74	8.91	5.35	10.18
	speech rate	4.32	4.27	3.1	4.95	4.69	3.84	3.57	3.4	3.57	5.36	3.01
	articulation rate	4.32	4.27	3.1	4.95	5.22	4.28	4.4	4.22	4.82	5.61	4.03
	ASD	0.231	0.234	0.323	0.202	0.192	0.234	0.227	0.237	0.207	0.178	0.248
	number of repairs	0	0	2	1	1	0	2	0	3	0	1
Speed Fluency	Speech rate (syllables divided per total time)	4.32	4.27	3.1	4.95	4.69	3.84	3.57	3.4	3.57	5.36	3.01
	Mean speech rate of the session	4.285714286				3.727100442						
	Articulation rate (syllables divided by phonation time)	4.32	4.27	3.1	4.95	5.22	4.28	4.4	4.22	4.82	5.61	4.03
	Mean articulation rate of the session	4.285714286				4.599493276						
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	18	18	21	60	16	14	7	6.666	8.6	30	5.857
	Mean length of utterance of the session (in syllables)	16.71428571				8.740740741						
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	4.17	4.22	6.78	12.13	3.065	3.27	1.591	1.58	1.782	5.35	1.454
	Mean length of utterance of the session (in seconds)	3.9				1.90037037						
	Number of pauses per second (total time)	0	0	0	0	0.146	0	0.446	0.339	0.331	0	0.440
	Mean number of pauses per second per session (total time)	0				0.3158559697						
	Number of pauses per second (speaking time)	0	0	0	0	0.163	0	0.549	0.421	0.448	0	0.589
	Mean number of pauses per second per session (speaking time)	0				0.3897875658						
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0.35	0.37	0.37	0.383	0.628	0.25	0.491
	Mean pause duration of the session	0				0.4448148148						
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	0.897	0.898	0.811	0.804	0.739	0.955	0.747
	Mean phonation time ratio per session	1				0.8103284902						
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	18	18	21	60	16	14	7	6.666	8.6	30	5.857
	Mean length of runs per session	16.71428571				8.740740741						
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.294	0.082	0.163	0	0.157	0	0.336	0	0.098
	Mean number of repairs per second per session (phonation time)	0.1098901099				0.136425648						

TABLE XIX.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 6 (PART 2)

		session 3													session 4						
	number of syllables	49	14	58	20	75	114	29	42	21	21	60	130	97	24	40	38	20	34	44	47
	number of silent pauses	2	1	5	1	2	12	1	8	2	1	5	11	8	2	2	2	1	1	3	1
	total duration (s)	16.89	3.75	17.46	5.52	16.21	31.05	5.73	17.07	7.35	5.89	18.06	36.14	29.74	8.35	10.54	9.23	5.03	7.93	13.1	11.35
	phonation time (s)	15.46	3.48	14.39	4.47	14.69	24.84	5.38	11.77	5.32	5.38	15.5	30.7	26.25	7.08	9.63	8.16	3.71	6.88	11.69	10.39
	speech rate	2.9	3.74	3.32	3.62	4.63	3.67	5.06	2.46	2.86	3.57	3.32	3.6	3.26	2.88	3.8	4.12	3.98	4.29	3.36	4.14
	articulation rate	3.17	4.03	4.03	4.48	5.11	4.59	5.39	3.57	3.95	3.91	3.87	4.23	3.7	3.39	4.15	4.66	5.39	4.94	3.76	4.53
	ASD	0.316	0.248	0.248	0.223	0.196	0.218	0.186	0.28	0.253	0.256	0.258	0.236	0.271	0.295	0.241	0.215	0.186	0.202	0.266	0.221
	number of repairs	0	0	1	0	2	2	1	2	0	0	0	4	2	0	1	2	1	1	0	2
Speed Fluency	Speech rate (syllables divided per total time)	2.9	3.74	3.32	3.62	4.63	3.67	5.06	2.46	2.86	3.57	3.32	3.6	3.26	2.88	3.8	4.12	3.98	4.29	3.36	4.14
	Mean speech rate of the session	3.46201271													3.769265985						
	Articulation rate (syllables divided by phonation time)	3.17	4.03	4.03	4.48	5.11	4.59	5.39	3.57	3.95	3.91	3.87	4.23	3.7	3.39	4.15	4.66	5.39	4.94	3.76	4.53
	Mean articulation rate of the session	4.10966616													4.292665971						
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	16.33	7	9.666	10	25	8.769	14.5	4.666	7	10.5	10	10.83	10.77	8	13.33	12.66	10	17	11	23.5
	Mean length of utterance of the session (in syllables)	10.13888889													13						
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.153	1.74	2.398	2.235	4.896	1.910	2.69	1.307	1.773	2.69	2.583	2.558	2.916	2.36	3.21	2.72	1.855	3.44	2.922	5.195
	Mean length of utterance of the session (in seconds)	2.467083333													3.028421053						
	Number of pauses per second (total time)	0.118	0.266	0.286	0.181	0.123	0.386	0.174	0.468	0.272	0.169	0.276	0.304	0.268	0.239	0.189	0.216	0.198	0.126	0.229	0.088
	Mean number of pauses per second per session (total time)	0.2798065067													0.1831222341						
	Number of pauses per second (speaking time)	0.129	0.287	0.347	0.223	0.136	0.483	0.185	0.679	0.375	0.185	0.322	0.358	0.304	0.282	0.207	0.245	0.269	0.145	0.256	0.096
	Mean number of pauses per second per session (speaking time)	0.3321511006													0.2085505735						
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.476	0.135	0.511	0.525	0.506	0.477	0.175	0.588	0.676	0.255	0.426	0.453	0.387	0.423	0.303	0.356	0.66	0.525	0.3525	0.48
	Mean pause duration of the session	0.4615277778													0.4205263158						
	Phonation time ratio (phonation time divided by total time)	0.915	0.928	0.824	0.809	0.906	0.8	0.938	0.689	0.723	0.913	0.858	0.849	0.882	0.847	0.913	0.884	0.737	0.867	0.892	0.915
	Mean phonation time ratio per session	0.8424072845													0.8780711125						
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	16.33	7	9.666	10	25	8.769	14.5	4.666	7	10.5	10	10.83	10.77	8	13.33	12.66	10	17	11	23.5
	Mean length of runs per session	10.13888889													13						
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.069	0	0.136	0.080	0.185	0.169	0	0	0	0.130	0.076	0	0.103	0.245	0.269	0.145	0	0.192
	Mean number of repairs per second per session (phonation time)	0.0788155154													0.1216545012						

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TABLE XX. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 6 (PART 3)

		session 5											
	number of syllables	11	31	108	19	21	19	38	51	30	30	35	38
	number of silent pauses	1	0	3	1	0	2	0	2	1	0	0	3
	total duration (s)	4.43	7.01	23.31	4.24	4.06	4.43	7.85	11.53	5.26	6.28	7.01	9.86
	phonation time (s)	4.04	7.01	21.62	3.84	4.06	3.45	7.85	10.7	4.91	6.28	7.01	8.92
	speech rate	2.48	4.42	4.63	4.48	5.17	4.29	4.84	4.42	5.7	4.78	4.99	3.85
	articulation rate	2.72	4.42	5	4.94	5.17	5.51	4.84	4.77	6.11	4.78	4.99	4.26
	ASD	0.368	0.226	0.2	0.202	0.193	0.182	0.207	0.21	0.164	0.209	0.2	0.235
	number of repairs	0	1	3	1	0	0	0	2	1	0	0	3
Speed Fluency	Speech rate (syllables divided per total time)	2.48	4.42	4.63	4.48	5.17	4.29	4.84	4.42	5.7	4.78	4.99	3.85
	Mean speech rate of the session	4.523984465											
	Articulation rate (syllables divided by phonation time)	2.72	4.42	5	4.94	5.17	5.51	4.84	4.77	6.11	4.78	4.99	4.26
	Mean articulation rate of the session	4.805440963											
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	5.5	31	27	9.5	21	6.333	38	17	15	30	35	9.5
	Mean length of utterance of the session (in syllables)	17.24											
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.02	7.01	5.405	1.92	4.06	1.15	7.85	3.566	2.455	6.28	7.01	2.23
	Mean length of utterance of the session (in seconds)	3.5876											
	Number of pauses per second (total time)	0.225	0	0.128	0.236	0	0.451	0	0.173	0.190	0	0	0.304
	Mean number of pauses per second per session (total time)	0.1364542878											
	Number of pauses per second (speaking time)	0.247	0	0.138	0.260	0	0.579	0	0.186	0.203	0	0	0.336
	Mean number of pauses per second per session (speaking time)	0.1449436949											
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.195	0	0.4225	0.2	0	0.326	0	0.276	0.175	0	0	0.235
	Mean pause duration of the session	0.2232											
	Phonation time ratio (phonation time divided by total time)	0.911	1	0.927	0.905	1	0.778	1	0.928	0.933	1	1	0.904
	Mean phonation time ratio per session	0.9414296211											
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	5.5	31	27	9.5	21	6.333	38	17	15	30	35	9.5
	Mean length of runs per session	17.24											
Repair Fluency	Number of repairs per second (phonation time)	0	0.142	0.138	0.260	0	0	0	0.186	0.203	0	0	0.336
	Mean number of repairs per second per session (phonation time)	0.122644665											

TABLE XXI. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 6 (PART

		session 6														
	number of syllables	30	31	34	34	70	43	57	8	16	58	23	62	78	28	19
	number of silent pauses	0	0	1	6	6	5	4	1	0	6	0	7	1	1	2
	total duration (s)	7.07	6.88	8.89	14.14	18.59	12.73	15.58	2.7	4.03	19.94	4.53	16.26	20.6	6.54	5.37
	phonation time (s)	7.07	6.88	8.19	11.15	15.38	8.89	13.26	2.29	4.03	13.7	4.53	12.48	20.05	6.17	4.84
	speech rate	4.25	4.5	3.82	2.4	3.77	3.38	3.66	2.96	3.97	2.91	5.08	3.81	3.79	4.28	3.54
	articulation rate	4.25	4.5	4.15	3.05	4.55	4.84	4.3	3.5	3.97	4.23	5.08	4.97	3.89	4.53	3.93
	ASD	0.236	0.222	0.241	0.328	0.22	0.207	0.233	0.286	0.252	0.236	0.197	0.201	0.257	0.221	0.255
	number of repairs	0	0	1	2	2	2	1	0	1	3	0	1	2	1	0
Speed Fluency	Speech rate (syllables divided per total time)	4.25	4.5	3.82	2.4	3.77	3.38	3.66	2.96	3.97	2.91	5.08	3.81	3.79	4.28	3.54
	Mean speech rate of the session	3.606957583														
	Articulation rate (syllables divided by phonation time)	4.25	4.5	4.15	3.05	4.55	4.84	4.3	3.5	3.97	4.23	5.08	4.97	3.89	4.53	3.93
	Mean articulation rate of the session	4.254553308														
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	30	31	17	4.857	10	7.166	11.4	4	16	8.285	23	7.75	39	14	6.333
	Mean length of utterance of the session (in syllables)	10.74545455														
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	7.07	6.88	4.095	1.592	2.197	1.481	2.652	1.145	4.03	1.957	4.53	1.56	10.02	3.085	1.613
	Mean length of utterance of the session (in seconds)	2.525636364														
	Number of pauses per second (total time)	0	0	0.112	0.424	0.322	0.392	0.256	0.370	0	0.300	0	0.430	0.048	0.152	0.372
	Mean number of pauses per second per session (total time)	0.2441257247														
	Number of pauses per second (speaking time)	0	0	0.122	0.538	0.390	0.562	0.301	0.436	0	0.437	0	0.560	0.049	0.162	0.413
	Mean number of pauses per second per session (speaking time)	0.2879562307														
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0.35	0.427	0.458	0.64	0.464	0.205	0	0.891	0	0.472	0.275	0.185	0.176
	Mean pause duration of the session	0.4534545455														
	Phonation time ratio (phonation time divided by total time)	1	1	0.921	0.788	0.827	0.698	0.851	0.848	1	0.687	1	0.767	0.973	0.943	0.901
	Mean phonation time ratio per session	0.8477876106														
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	30	31	17	4.857	10	7.166	11.4	4	16	8.285	23	7.75	39	14	6.333
	Mean length of runs per session	10.74545455														
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.122	0.179	0.130	0.224	0.075	0	0.248	0.218	0	0.080	0.099	0.162	0
	Mean number of repairs per second per session (phonation time)	0.1151824923														

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TABLE XXII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 6 (PART 5)

		session 7						session 8										
	number of syllables	32	52	14	16	14	34	18	21	55	16	27	34	14	60	13	16	44
	number of silent pauses	1	5	0	2	0	2	2	0	1	1	0	2	1	3	0	0	5
	total duration (s)	6.46	14.38	3.17	5.94	3.04	10.64	6.02	4.77	12.52	6.23	6.23	8.92	3.51	15.69	2.73	4.48	11.9
	phonation time (s)	6.11	12.2	3.17	4.49	3.04	9.94	5	4.77	11.9	5.21	6.23	7.7	2.7	14.29	2.73	4.48	9.15
	speech rate	4.95	3.62	4.41	2.69	4.6	3.19	2.99	4.41	4.39	2.57	4.33	3.81	3.99	3.83	4.76	3.57	3.7
	articulation rate	5.24	4.26	4.41	3.57	4.6	3.42	3.6	4.41	4.62	3.07	4.33	4.41	5.19	4.2	4.76	3.57	4.81
	ASD	0.191	0.235	0.227	0.28	0.217	0.292	0.278	0.227	0.216	0.325	0.231	0.227	0.193	0.238	0.21	0.28	0.208
	number of repairs	0	1	1	0	0	1	0	0	1	0	1	1	0	1	0	0	0
Speed Fluency	Speech rate (syllables divided per total time)	4.95	3.62	4.41	2.69	4.6	3.19	2.99	4.41	4.39	2.57	4.33	3.81	3.99	3.83	4.76	3.57	3.7
	Mean speech rate of the session	3.713041485						3.831325301										
	Articulation rate (syllables divided by phonation time)	5.24	4.26	4.41	3.57	4.6	3.42	3.6	4.41	4.62	3.07	4.33	4.41	5.19	4.2	4.76	3.57	4.81
	Mean articulation rate of the session	4.159178434						4.28802589										
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	16	8.666	14	5.333	14	11.33	6	21	27.5	8	27	11.333	7	15	13	16	7.3333
	Mean length of utterance of the session (in syllables)	10.125						12.23076923										
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	3.055	2.033	3.17	1.496	3.04	3.313	1.6666	4.77	5.95	2.605	6.23	2.5666	1.35	3.5725	2.73	4.48	1.525
	Mean length of utterance of the session (in seconds)	2.434375						2.852307692										
	Number of pauses per second (total time)	0.154	0.347	0	0.336	0	0.187	0.3322	0	0.0796	0.1605	0	0.2242	0.2849	0.1912	0	0	0.4201
	Mean number of pauses per second per session (total time)	0.2292000917						0.1807228916										
	Number of pauses per second (speaking time)	0.163	0.409	0	0.445	0	0.201	0.4	0	0.084	0.1919	0	0.2597	0.3703	0.2099	0	0	0.5464
	Mean number of pauses per second per session (speaking time)	0.2567394095						0.2022653722										
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.175	0.363	0	0.483	0	0.233	0.34	0	0.31	0.51	0	0.4066	0.405	0.35	0	0	0.4583
	Mean pause duration of the session	0.2925						0.34										
	Phonation time ratio (phonation time divided by total time)	0.945	0.848	1	0.755	1	0.934	0.8305	1	0.9504	0.8362	1	0.8632	0.7692	0.9107	1	1	0.7689
	Mean phonation time ratio per session	0.8927343571						0.8934939759										
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	16	8.666	14	5.333	14	11.33	6	21	27.5	8	27	11.333	7	15	13	16	7.3333
	Mean length of runs per session	10.125						12.23076923										
Repair Fluency	Number of repairs per second (phonation time)	0	0.081	0.315	0	0	0.100	0	0	0.084	0	0.1605	0.1298	0	0.0699	0	0	0
	Mean number of repairs per second per session (phonation time)	0.07702182285						0.05393743258										

TABLE XXIII. RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 7 (PART 1)

		session 1		session 2				session 3				
	number of syllables	48	57	15	24	30	19	26	51	44	88	24
	number of silent pauses	0	0	2	0	0	0	0	8	7	8	2
	total duration (s)	12	18.61	4.19	5.21	7.33	3.67	7.38	19.11	16.83	25.79	9
	phonation time (s)	12	18.61	3.03	5.21	6.79	3.67	7.38	13.99	11.3	22.02	7.64
	speech rate	4	3.06	3.58	4.61	4.09	5.18	3.52	2.67	2.61	3.41	2.67
	articulation rate	4	3.06	4.95	4.61	4.42	5.18	3.52	3.65	3.89	4	3.14
	ASD	0.25	0.327	0.202	0.217	0.226	0.193	0.284	0.274	0.257	0.25	0.318
	number of repairs	1	3	0	0	1	0	1	0	2	2	1
Speed Fluency	Speech rate (syllables divided per total time)	4	3.06	3.58	4.61	4.09	5.18	3.52	2.67	2.61	3.41	2.67
	Mean speech rate of the session	3.430251552		4.31372549				2.982972731				
	Articulation rate (syllables divided by phonation time)	4	3.06	4.95	4.61	4.42	5.18	3.52	3.65	3.89	4	3.14
	Mean articulation rate of the session	3.430251552		4.705882353				3.738167816				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	48	57	5	24	30	19	26	5.666	5.5	9.777	8
	Mean length of utterance of the session (in syllables)	52.5		14.66666667				7.766666667				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	12	18.61	1.01	5.21	6.79	3.67	7.38	1.554	1.412	2.446	2.546
	Mean length of utterance of the session (in seconds)	15.305		3.116666667				2.077666667				
	Number of pauses per second (total time)	0	0	0.477	0.098	0	0	0	0.418	0.415	0.310	0.222
	Mean number of pauses per second per session (total time)	0		0.09803921569				0.3200614518				
	Number of pauses per second (speaking time)	0	0	0.66	0	0	0	0	0.57	0.619	0.36	0.26
	Mean number of pauses per second per session (speaking time)	0		0.1069518717				0.4010909674				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0.386	0	0.54	0	0	0.566	0.69	0.418	0.453
	Mean pause duration of the session	0		0.2833333333				0.526				
	Phonation time ratio (phonation time divided by total time)	1	1	0.723	1	0.926	1	1	0.731	0.671	0.853	0.848
	Mean phonation time ratio per session	1		0.9166666667				0.7979772116				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	48	57	5	24	30	19	26	5.666	5.5	9.777	8
	Mean length of runs per session	52.5		14.66666667				7.766666667				
Repair Fluency	Number of repairs per second (phonation time)	0.0833	0.1612	0	0	0.147	0	0.135	0	0.176	0.090	0.130
	Mean number of repairs per second per session (phonation time)	0.1306762496		0.05347593583				0.09626183218				

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TABLE XXIV.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 7 (PART 2)

		session 4					session 5			
	number of syllables	75	13	35	14	36	48	25	43	14
	number of silent pauses	0	1	0	0	0	0	0	1	0
	total duration (s)	27.05	4.14	9.23	4.4	11.51	10.57	5.99	12.13	3.98
	phonation time (s)	27.05	3.8	9.23	4.4	11.51	10.57	5.99	11.57	3.98
	speech rate	2.77	3.14	3.79	3.18	3.13	4.54	4.17	3.54	3.52
	articulation rate	2.77	3.42	3.79	3.18	3.13	4.54	4.17	3.72	3.52
	ASD	0.361	0.293	0.264	0.314	0.32	0.22	0.24	0.269	0.284
	number of repairs	1	1	1	0	1	2	0	0	0
Speed Fluency	Speech rate (syllables divided per total time)	2.77	3.14	3.79	3.18	3.13	4.54	4.17	3.54	3.52
	Mean speech rate of the session	3.071187644					3.979185797			
	Articulation rate (syllables divided by phonation time)	2.77	3.42	3.79	3.18	3.13	4.54	4.17	3.72	3.52
	Mean articulation rate of the session	3.089837471					4.048582996			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	75	6.5	35	14	36	48	25	21.5	14
	Mean length of utterance of the session (in syllables)	28.83333333					26			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	27.05	1.9	9.23	4.4	11.51	10.57	5.99	5.785	3.98
	Mean length of utterance of the session (in seconds)	9.331666667					6.422			
	Number of pauses per second (total time)	0	0.2415	0	0	0	0	0	0.0824	0
	Mean number of pauses per second per session (total time)	0.01775252974					0.03060912152			
	Number of pauses per second (speaking time)	0	0.2631	0	0	0	0	0	0.0864	0
	Mean number of pauses per second per session (speaking time)	0.0178603322					0.03114294612			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.17	0	0	0	0	0	0.28	0
	Mean pause duration of the session	0.05666666667					0.112			
	Phonation time ratio (phonation time divided by total time)	1	0.9178	1	1	1	1	1	0.9538	1
	Mean phonation time ratio per session	0.9939641399					0.9828588919			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	75	6.5	35	14	36	48	25	21.5	14
	Mean length of runs per session	28.83333333					26			
Repair Fluency	Number of repairs per second (phonation time)	0.0369	0.2631	0.1083	0	0.0868	0.1892	0	0	0
	Mean number of repairs per second per session (phonation time)	0.07144132881					0.09342883837			

TABLE XXV.   RESULT OF UTTERANCE FLUENCY EG PARTICIPANT 7 (PART 3)

		session 6								session7	session 8	
	number of syllables	51	34	24	28	25	116	18	100	/	24	12
	number of silent pauses	1	2	3	1	5	11	1	11	/	0	0
	total duration (s)	15.4	7.59	8.71	8.29	7.38	33.58	5.29	35.59	/	5.03	4.01
	phonation time (s)	14.95	6.23	6.52	7.83	5.57	28.97	4.63	28.9	/	5.03	4.01
	speech rate	3.31	4.48	2.76	3.38	3.39	3.45	3.89	2.81	/	4.77	2.99
	articulation rate	3.41	5.46	3.68	3.58	4.49	4	3.89	3.46	/	4.77	2.99
	ASD	0.293	0.183	0.272	0.28	0.223	0.25	0.257	0.289	/	0.209	0.334
	number of repairs	0	1	0	1	0	2	0	0	/	0	0
Speed Fluency	Speech rate (syllables divided per total time)	3.31	4.48	2.76	3.38	3.39	3.45	3.89	2.81	/	4.77	2.99
	Mean speech rate of the session	3.250430928								/	3.982300885	
	Articulation rate (syllables divided by phonation time)	3.41	5.46	3.68	3.58	4.49	4	3.89	3.46	/	4.77	2.99
	Mean articulation rate of the session	3.822393822								/	3.982300885	
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	25.5	11.333	6	14	4.1666	9.6666	9	8.3333	/	24	12
	Mean length of utterance of the session (in syllables)	9.209302326								/	18	
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	7.475	2.0766	1.63	3.915	0.9283	2.4141	2.315	2.4083	/	5.03	4.01
	Mean length of utterance of the session (in seconds)	2.409302326								/	4.52	
	Number of pauses per second (total time)	0.0649	0.2635	0.3444	0.1206	0.6775	0.3275	0.1890	0.3090	/	0	0
	Mean number of pauses per second per session (total time)	0.2872855618								/	0	
	Number of pauses per second (speaking time)	0.0668	0.3210	0.4601	0.1277	0.8976	0.3797	0.2159	0.3806	/	0	0
	Mean number of pauses per second per session (speaking time)	0.3378378378								/	0	
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.225	0.4533	0.5475	0.23	0.3016	0.3841	0.33	0.5575	/	0	0
	Mean pause duration of the session	0.4239534884								/	0	
	Phonation time ratio (phonation time divided by total time)	0.9707	0.8208	0.7485	0.9445	0.7547	0.8627	0.8752	0.8120	/	1	1
	Mean phonation time ratio per session	0.8503652631								/	1	
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	25.5	11.333	6	14	4.1666	9.6666	9	8.3333	/	24	12
	Mean length of runs per session	9.209302326								/	18	
Repair Fluency	Number of repairs per second (phonation time)	0	0.1605	0	0.1277	0	0.0690	0	0	/	0	0
	Mean number of repairs per second per session (phonation time)	0.03861003861								/	0	

TABLE XXVI.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 1 (PART 1)

		session 1				session 2				session 3							
	number of syllables	57	24	33	52	30	11	27	22	54	23	25	61	25	8	19	9
	number of silent pauses	0	0	0	0	2	0	4	1	1	3	1	5	0	0	1	1
	total duration (s)	12.71	6.59	10.77	12.76	8.21	2.31	9.81	6.67	16.7	8.29	6.54	17.28	6.57	2.89	3.96	3.67
	phonation time (s)	12.71	6.59	10.77	12.76	6.1	1.7	7.62	5.63	16.32	6.04	6.05	13.85	6.57	2.59	3.68	2.42
	speech rate	4.49	3.64	3.06	4.08	3.65	4.76	2.75	3.3	3.23	2.77	3.82	3.53	3.81	2.77	4.8	2.45
	articulation rate	4.49	3.64	3.06	4.09	4.92	6.47	3.54	3.91	3.31	3.81	4.13	4.4	3.81	3.08	5.16	3.72
	ASD	0.223	0.275	0.326	0.245	0.203	0.154	0.282	0.256	0.302	0.262	0.242	0.227	0.263	0.324	0.194	0.269
	number of repairs	1	2	6	1	1	1	1	2	2	0	1	3	2	0	2	0
Speed Fluency	Speech rate (syllables divided per total time)	4.49	3.64	3.06	4.08	3.65	4.76	2.75	3.3	3.23	2.77	3.82	3.53	3.81	2.77	4.8	2.45
	Mean speech rate of the session	3.875				3.333				3.4							
	Articulation rate (syllables divided by phonation time)	4.49	3.64	3.06	4.09	4.92	6.47	3.54	3.91	3.31	3.81	4.13	4.4	3.81	3.08	5.16	3.72
	Mean articulation rate of the session	3.875				4.276				3.894							
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	57	24	33	52	10	11	5.4	11	27	5.75	12.5	10.16	25	8	9.5	4.5
	Mean length of utterance of the session (in syllables)	41.5				8.181818182				11.2							
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	12.71	6.59	10.77	12.76	2.033	1.7	1.524	2.815	8.16	1.51	3.025	2.308	6.57	2.59	1.84	1.21
	Mean length of utterance of the session (in seconds)	10.7075				1.913636364				2.876							
	Number of pauses per second (total time)	0	0	0	0	0.243	0	0.4077	0.149	0.0598	0.361	0.1529	0.289	0	0	0.2525	0.272
	Mean number of pauses per second per session (total time)	0				0.2592592593				0.1820940819							
	Number of pauses per second (speaking time)	0	0	0	0	0.327	0	0.5249	0.177	0.0612	0.496	0.1652	0.361	0	0	0.2711	0.413
	Mean number of pauses per second per session (speaking time)	0				0.3325415677				0.2086230876							
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0.703	0.61	0.438	0.52	0.19	0.562	0.245	0.571	0	0.3	0.14	0.625
	Mean pause duration of the session	0				0.5409090909				0.419							
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	0.742	0.7359	0.7767	0.844	0.9772	0.728	0.9250	0.801	1	0.8961	0.9292	0.659
	Mean phonation time ratio per session	1				0.7796296296				0.8728376328							
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	57	0	0	0	0.066	0	0.1481	0.045	0.0185	0.130	0.04	0.081	0	0	0.052	0.111
	Mean length of runs per session	41.5				8.181818182				11.2							
Repair Fluency	Number of repairs per second (phonation time)	0.0786	0.3034	0.557	0.078	0.163	0.5882	0.1312	0.355	0.1225	0	0.1652	0.216	0.3044	0	0.5434	0
	Mean number of repairs per second per session (phonation time)	0.2334812048				0.2375296912				0.173852573							

I.

TABLE XXVII.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 1 (PART 2)

		session 4										session 5		
	number of syllables	12	12	12	7	12	21	12	56	32	22	8	80	12
	number of silent pauses	0	1	0	0	1	2	0	8	0	0	0	6	0
	total duration (s)	6.33	3.43	2.21	3.51	5.03	8.01	2.91	19.94	7.04	5.71	2.6	24.33	2.86
	phonation time (s)	6.33	2.91	2.21	3.51	3.92	6.11	2.91	16.45	7.04	5.71	2.23	20.52	2.86
	speech rate	1.89	3.49	3.17	3.42	4.18	2.62	4.12	2.81	4.55	3.86	3.08	3.29	4.2
	articulation rate	1.89	4.13	3.17	3.42	5.36	3.43	4.12	3.4	4.55	3.86	3.59	3.9	4.2
	ASD	0.528	0.242	0.315	0.293	0.187	0.291	0.243	0.294	0.22	0.259	0.278	0.256	0.238
	number of repairs	1	1	0	1	1	1	0	3	2	1	0	4	1
Speed Fluency	Speech rate (syllables divided per total time)	1.89	3.49	3.17	3.42	4.18	2.62	4.12	2.81	4.55	3.86	3.08	3.29	4.2
	Mean speech rate of the session	3.088										3.357		
	Articulation rate (syllables divided by phonation time)	1.89	4.13	3.17	3.42	5.36	3.43	4.12	3.4	4.55	3.86	3.59	3.9	4.2
	Mean articulation rate of the session	3.468										3.905		
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	12	6	12	7	6	7	12	6.2222	32	22	8	11.42	12
	Mean length of utterance of the session (in syllables)	9										11.11111111		
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	6.33	1.455	2.21	3.51	1.96	2.0366	2.91	1.8277	7.04	5.71	2.23	2.931	2.86
	Mean length of utterance of the session (in seconds)	2.595454545										2.845555556		
	Number of pauses per second (total time)	0	0.2915	0	0	0.1988	0.2496	0	0.4012	0	0	0	0.246	0
	Mean number of pauses per second per session (total time)	0.1871490954										0.2014098691		
	Number of pauses per second (speaking time)	0	0.3436	0	0	0.2551	0.3273	0	0.4863	0	0	0	0.292	0
	Mean number of pauses per second per session (speaking time)	0.2101576182										0.234283483		
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.26	0	0	0.555	0.6333	0	0.3877	0	0	0.37	0.544	0
	Mean pause duration of the session	0.3190909091										0.4644444444		
	Phonation time ratio (phonation time divided by total time)	1	0.8483	1	1	0.7793	0.7627	1	0.8249	1	1	0.857	0.843	1
	Mean phonation time ratio per session	0.8905177792										0.8596844579		
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	0	0.0833	0	0	0.0833	0.0952	0	0.1428	0	0	0	0.075	0
	Mean length of runs per session	9										11.11111111		
Repair Fluency	Number of repairs per second (phonation time)	0.1579	0.3436	0	0.2849	0.2551	0.1636	0	0.1823	0.2840	0.1751	0	0.194	0.349
	Mean number of repairs per second per session (phonation time)	0.1926444834										0.1952362358		

TABLE XXVIII.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 1 (PART 3)

		session 6							session 7				session 8				
	number of syllables	6	13	23	54	17	20	32	15	21	14	21	22	8	11	12	24
	number of silent pauses	0	0	1	6	2	0	5	0	4	2	3	2	2	3	2	0
	total duration (s)	1.61	3.7	7.12	22.27	5.52	4.79	11.56	3.62	8.63	4.14	7.09	6.39	4.01	3.85	4.69	6.44
	phonation time (s)	1.61	2.98	6.51	15.82	4.31	4.79	9.06	3.62	5.7	3.26	4.91	5.2	2.18	2.97	2.77	6.44
	speech rate	3.74	3.52	3.23	2.42	3.08	4.17	2.77	4.15	2.43	3.38	2.96	3.45	2	2.86	2.56	3.73
	articulation rate	3.74	4.36	3.53	3.41	3.95	4.17	3.53	4.15	3.68	4.3	4.27	4.23	3.68	3.7	4.34	3.73
	ASD	0.268	0.23	0.283	0.293	0.253	0.24	0.283	0.241	0.271	0.233	0.234	0.236	0.272	0.27	0.231	0.268
	number of repairs	0	1	2	3	0	0	3	1	1	2	1	2	0	0	2	3
Speed Fluency	Speech rate (syllables divided per total time)	3.74	3.52	3.23	2.42	3.08	4.17	2.77	4.15	2.43	3.38	2.96	3.45	2	2.86	2.56	3.73
	Mean speech rate of the session	2.917							3.024				3.034				
	Articulation rate (syllables divided by phonation time)	3.74	4.36	3.53	3.41	3.95	4.17	3.53	4.15	3.68	4.3	4.27	4.23	3.68	3.7	4.34	3.73
	Mean articulation rate of the session	3.66							4.05				3.937				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	6	13	11.5	7.714	5.666	20	5.333	15	4.2	4.666	5.25	7.333	2.666	2.75	4	24
	Mean length of utterance of the session (in syllables)	7.857142857							5.461538462				5.5				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	1.61	2.98	3.255	2.26	1.436	4.79	1.51	3.62	1.14	1.086	1.227	1.733	0.726	0.7425	0.923	6.44
	Mean length of utterance of the session (in seconds)	2.146666667							1.345384615				1.397142857				
	Number of pauses per second (total time)	0	0	0.140	0.269	0.362	0	0.432	0	0.463	0.483	0.423	0.312	0.498	0.779	0.426	0
	Mean number of pauses per second per session (total time)	0.247480997							0.3833049404				0.3546099291				
	Number of pauses per second (speaking time)	0	0	0.153	0.379	0.464	0	0.551	0	0.701	0.613	0.610	0.384	0.917	1.010	0.722	0
	Mean number of pauses per second per session (speaking time)	0.3105590062							0.5145797599				0.4601226994				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.72	0.305	0.921	0.403	0	0.416	0	0.586	0.293	0.545	0.396	0.61	0.22	0.64	0
	Mean pause duration of the session	0.5471428571							0.4607692308				0.4157142857				
	Phonation time ratio (phonation time divided by total time)	1	0.805	0.914	0.710	0.780	1	0.783	1	0.660	0.787	0.692	0.813	0.543	0.771	0.590	1
	Mean phonation time ratio per session	0.7968888103							0.7448892675				0.7706855792				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	0	0	0.043	0.111	0.117	0	0.156	0	0.190	0.142	0.142	0.090	0.25	0.272	0.166	0
	Mean length of runs per session	7.857142857							5.461538462				5.5				
Repair Fluency	Number of repairs per second (phonation time)	0	0.335	0.307	0.189	0	0	0.331	0.276	0.175	0.613	0.203	0.384	0	0	0.722	0.465
	Mean number of repairs per second per session (phonation time)	0.1996450754							0.2858776444				0.3578732106				

TABLE XXIX.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 2 (PART 1)

		session 1				session 2									session 3									
	number of syllables	26	57	49	70	75	11	11	36	23	47	12	49	35	49	30	91	36	20	28	33	37	27	68
	number of silent pauses	0	0	0	0	8	0	0	3	1	6	0	4	5	1	3	5	1	0	4	2	2	1	8
	total duration (s)	5.68	14.09	12.11	18.69	23.86	3.46	3.15	12.6	6.26	14.46	2.75	15.61	13.31	16.36	9.65	20.91	9.65	5.68	14.56	9.34	10.88	6.54	26.6
	phonation time (s)	5.68	14.09	12.11	18.69	18.39	3.46	3.15	9.57	5.16	12.07	2.75	13.76	10.44	16.01	7.19	18.93	8.71	4.74	8.71	8.59	9.81	5.7	21.74
	speech rate	4.58	4.04	4.05	3.75	3.14	3.18	3.5	2.86	3.68	3.25	4.36	3.14	2.63	2.99	3.11	4.35	3.73	3.52	1.92	3.53	3.4	4.13	2.56
	articulation rate	4.58	4.04	4.05	3.75	4.08	3.18	3.5	3.76	4.46	3.89	4.36	3.56	3.35	3.06	4.18	4.81	4.13	4.22	3.22	3.84	3.77	4.73	3.13
	ASD	0.218	0.247	0.247	0.267	0.245	0.315	0.286	0.266	0.224	0.257	0.23	0.281	0.298	0.327	0.24	0.208	0.242	0.237	0.311	0.26	0.265	0.211	0.32
	number of repairs	1	0	0	3	3	0	1	1	1	3	0	1	1	3	1	0	1	0	0	0	0	1	6
Speed Fluency	Speech rate (syllables divided by total time)	4.58	4.04	4.05	3.75	3.14	3.18	3.5	2.86	3.68	3.25	4.36	3.14	2.63	2.99	3.11	4.35	3.73	3.52	1.92	3.53	3.4	4.13	2.56
	Mean speech rate of the session	3.994				2.619									3.218867635									
	Articulation rate (syllables divided by phonation time)	0.218	0.247	0.247	0.267	0.245	0.315	0.286	0.266	0.224	0.257	0.23	0.281	0.298	0.327	0.24	0.208	0.242	0.237	0.311	0.26	0.265	0.211	0.32
	Mean articulation rate of the session	3.994				3.797									3.80459457									
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	26	57	49	70	8.3333	11	11	9	11.5	6.7142	12	9.8	5.8333	24.5	7.5	15.16	18	20	5.6	11	12.33	13.5	7.555
	Mean length of utterance of the session (in syllables)	50.5				8.305555556									11.32432432									
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.68	14.09	12.11	18.69	2.0433	3.46	3.15	2.3925	2.58	1.7242	2.75	2.752	1.74	8.005	1.7975	3.155	4.355	4.74	1.742	2.863	3.27	2.85	2.415
	Mean length of utterance of the session (in seconds)	12.6425				2.1875									2.976486486									
	Number of pauses per second (total time)	0	0	0	0	0.3352	0	0.238	0.1597	0.4149	0	0.2562	0.3756		0.061	0.310	0.239	0.103	0	0.274	0.214	0.183	0.152	0.300
	Mean number of pauses per second per session (total time)	0				0.2365308804									0.2074210648									
	Number of pauses per second (speaking time)	0	0	0	0	0.4350	0	0.3134	0.1937	0.4971	0	0.2906	0.4789		0.062	0.417	0.264	0.114	0	0.459	0.232	0.203	0.175	0.367
	Mean number of pauses per second per session (speaking time)	0				0.3428571429									0.2451648052									
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0.6077	0	0.7575	0.55	0.3414	0	0.37	0.4783		0.175	0.615	0.33	0.47	0.94	1.17	0.25	0.356	0.42	0.54
	Mean pause duration of the session	0				0.9833333333									0.5416216216									
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	0.7707	1	0.7595	0.8242	0.8347	1	0.8814	0.7843		0.978	0.745	0.905	0.902	0.834	0.598	0.919	0.901	0.871	0.817
	Mean phonation time ratio per session	1				0.6898817346									0.8460474764									
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	26	57	49	70	8.3333	11	11	9	11.5	6.7142	12	9.8	5.8333	24.5	7.5	15.16	18	20	5.6	11	12.33	13.5	7.555
	Mean length of runs per session	50.5				8.305555556									11.32432432									
Repair Fluency	Number of repairs per second (phonation time)	0.176	0	0	0.160	0.1631	0	0.3174	0.1044	0.1937	0.2485	0	0.072	0.0957	0.187	0.139	0	0.114	0	0	0	0	0.175	0.275
	Mean number of repairs per second per session (phonation time)	0.07909827961				0.1396825397									0.1089621357									

TABLE XXX. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 2 (PART 2)

		session 4											session 5				
	number of syllables	21	37	31	53	48	23	41	43	39	65	24	41	18	86	47	36
	number of silent pauses	3	6	4	7	1	2	2	6	5	4	0	1	1	4	3	2
	total duration (s)	11.17	16	11.09	16.6	13.62	6.96	12.92	15.89	12.66	20.91	6.41	10.1	5.29	20.65	15.03	12.63
	phonation time (s)	9.06	10.57	8.08	12.96	12.91	6.1	12.36	12.49	9.98	19.29	6.01	9.74	4.87	18.66	13.19	10.9
	speech rate	1.88	2.31	2.8	3.19	3.52	3.3	3.17	2.71	3.08	3.11	3.74	4.06	3.4	4.16	3.13	2.85
	articulation rate	2.32	3.5	3.84	4.09	3.72	3.77	3.32	3.44	3.91	3.37	4	4.21	3.69	4.61	3.56	3.3
	ASD	0.432	0.286	0.261	0.245	0.269	0.265	0.301	0.29	0.256	0.297	0.25	0.238	0.271	0.217	0.281	0.303
	number of repairs	2	2	0	3	3	1	0	2	1	1	1	2	1	4	1	0
Speed Fluency	Speech rate (syllables divided by total time)	1.88	2.31	2.8	3.19	3.52	3.3	3.17	2.71	3.08	3.11	3.74	4.06	3.4	4.16	3.13	2.85
	Mean speech rate of the session	2.946682382											3.579277865				
	Articulation rate (syllables divided by phonation time)	0.432	0.286	0.261	0.245	0.269	0.265	0.301	0.29	0.256	0.297	0.25	0.238	0.271	0.217	0.281	0.303
	Mean articulation rate of the session	3.547283198											3.974895397				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	5.25	5.285	6.2	6.625	24	7.666	13.66	6.142	6.5	13	24	20.5	9	17.2	11.75	12
	Mean length of utterance of the session (in syllables)	8.333333333											14.25				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.265	1.51	1.616	1.62	6.455	2.033	4.12	1.784	1.663	3.858	6.01	4.87	2.435	3.732	3.29753	6.33
	Mean length of utterance of the session (in seconds)	2.349215686											3.585				
	Number of pauses per second (total time)	0.2685	0.375	0.360	0.421	0.073	0.287	0.154	0.377	0.394	0.191		0	0.099	0.189	0.193	0.199	0.158
	Mean number of pauses per second per session (total time)	0.2773348125											0.1726844584				
	Number of pauses per second (speaking time)	0.331	0.567	0.495	0.540	0.077	0.327	0.161	0.480	0.501	0.207		0	0.102	0.205	0.214	0.227	0.183
	Mean number of pauses per second per session (speaking time)	0.3338619481											0.1917712692				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.5275	0.775	0.602	0.455	0.355	0.286	0.186	0.485	0.446	0.324	0.4	0.18	0.21	0.398	0.46	0.576
	Mean pause duration of the session	0.4788235294											0.39625				
	Phonation time ratio (phonation time divided by total time)	0.811	0.660	0.728	0.780	0.947	0.876	0.956	0.786	0.788	0.922	0.937	0.964	0.920	0.903	0.877	0.863
	Mean phonation time ratio per session	0.830687097											0.9004709576				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	5.25	5.285	6.2	6.625	24	7.666	13.66	6.142	6.5	13	24	20.5	9	17.2	11.75	12
	Mean length of runs per session	8.333333333											14.25				
Repair Fluency	Number of repairs per second (phonation time)	0.2207	0.189	0	0.231	0.232	0.163	0	0.160	0.100	0.051	0.166	0.205	0.205	0.214	0.075	0
	Mean number of repairs per second per session (phonation time)	0.1335447792											0.1394700139				

TABLE XXXI. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 2 (PART 3)

		session 6				session7	session 8	
	number of syllables	58	18	24	40	9	55	15
	number of silent pauses	2	0	4	4	0	13	1
	total duration (s)	16.34	5.37	9.05	14.48	3.04	26.03	4.77
	phonation time (s)	15.62	5.37	7.09	10.72	3.04	14.23	4.43
	speech rate	3.55	3.35	2.65	2.76	2.96	2.11	3.15
	articulation rate	3.71	3.35	3.38	3.73	2.96	3.86	3.39
	ASD	0.269	0.298	0.296	0.268	2.96	0.259	0.295
	number of repairs	1	1	1	2	2	4	0
Speed Fluency	Speech rate (syllables divided by total time)	3.55	3.35	2.65	2.76	2.96	2.11	3.15
	Mean speech rate of the session	3.094606543				2.96	2.272727273	
	Articulation rate (syllables divided by phonation time)	0.269	0.298	0.296	0.268	2.96	0.259	0.295
	Mean articulation rate of the session	3.608247423				2.96	3.751339764	
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	19.333	18	4.8	8	9	3.9285	7.5
	Mean length of utterance of the session (in syllables)	10				9	4.375	
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.2066	5.37	1.418	2.144	3.04	1.0164	2.215
	Mean length of utterance of the session (in seconds)	2.771428571				0.7326732	1.16625	
	Number of pauses per second (total time)	0.1223	0	0.4419	0.2762	0	0.4994	0.2096
	Mean number of pauses per second per session (total time)	0.2210433245				0	0.4545454545	
	Number of pauses per second (speaking time)	0.1280	0	0.564	0.3731	0	0.9135	0.2257
	Mean number of pauses per second per session (speaking time)	0.2577319588				0	0.7502679528	
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.24	0	0.392	0.752		0.8428	0.17
	Mean pause duration of the session	0.46				0	0.75875	
	Phonation time ratio (phonation time divided by total time)	0.9559	1	0.7834	0.7403	1	0.5466	0.9287
	Mean phonation time ratio per session	0.857648099				1	0.6058441558	
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	19.333	18	4.8	8	9	3.9285	7.5
	Mean length of runs per session	10				9	4.375	
Repair Fluency	Number of repairs per second (phonation time)	0.0640	0.1862	0.1410	0.1865	0.6578947	0.2810	0
	Mean number of repairs per second per session (phonation time)	0.1288659794				0.658	0.2143622722	

TABLE XXXII. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 3 (PART 1)

Category	Metric	session 1				session 2		session 3				session 4				
	number of syllables	16	48	43	21	21	11	22	26	34	40	19	47	23	32	15
	number of silent pauses	0	0	0	0	1	0	0	1	1	2	0	0	0	3	0
	total duration (s)	4.37	13.78	10.57	4.11	6.41	2.15	5.31	7.35	8.74	11.11	5.89	13.02	7.56	8.61	4.06
	phonation time (s)	4.37	13.78	10.57	4.11	5.37	2.15	5.31	7.02	8.46	9.47	5.89	13.02	7.56	7.33	4.06
	speech rate	3.66	3.48	4.07	5.11	3.28	5.11	4.14	3.54	3.89	3.6	3.23	3.61	3.04	3.72	3.69
	articulation rate	3.66	3.48	4.07	5.11	3.91	5.11	4.14	3.71	4.02	4.23	3.23	3.61	3.04	4.37	3.69
	ASD	0.273	0.287	0.246	0.196	0.256	0.196	0.242	0.27	0.249	0.237	0.31	0.277	0.329	0.229	0.271
	number of repairs	0	0	2	0	0	0	0	1	2	1	0	1	2	1	0
Speed Fluency	Speech rate (syllables divided per total time)	3.66	3.48	4.07	5.11	3.28	5.11	4.14	3.54	3.89	3.6	3.23	3.61	3.04	3.72	3.69
	Mean speech rate of the session	3.898872982				3.738317757		3.75269148				3.474706183				
	Articulation rate (syllables divided by phonation time)	3.66	3.48	4.07	5.11	3.91	5.11	4.14	3.71	4.02	4.23	3.23	3.61	3.04	4.37	3.69
	Mean articulation rate of the session	3.898872982				4.255319149		4.03172505				3.592181722				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	16	48	43	21	10.5	11	22	13	17	13.33	19	47	23	8	15
	Mean length of utterance of the session (in syllables)	32				10.66666667		15.25				17				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	4.37	13.78	10.57	4.11	2.685	2.15	5.31	3.51	4.23	3.156	5.89	13.02	7.56	1.8325	4.06
	Mean length of utterance of the session (in seconds)	8.2075				2.506666667		3.7825				4.7325				
	Number of pauses per second (total time)	0	0	0	0	0.156	0	0	0.136	0.114	0.180	0	0	0	0.348	0
	Mean number of pauses per second per session (total time)	0				0.116822429		0.1230390649				0.07664793051				
	Number of pauses per second (speaking time)	0	0	0	0	0.186	0	0	0.142	0.118	0.211	0	0	0	0.409	0
	Mean number of pauses per second per session (speaking time)	0				0.132978723		0.1321877065				0.07923930269				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0.52	0	0	0.165	0.14	0.546	0	0	0	0.32	0
	Mean pause duration of the session	0				0.346666666		0.28125				0.16				
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	0.837	1	1	0.955	0.967	0.852	1	1	1	0.851	1
	Mean phonation time ratio per session	1				0.878504672		0.930790526				0.967296883				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	16	48	43	21	10.5	11	22	13	17	13.33	19	47	23	8	15
	Mean length of runs per session	32				10.66666667		15.25				17				
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.189	0	0	0	0	0.142	0.236	0.105	0	0.076	0.264	0.136	0
	Mean number of repairs per second per session (phonation time)	0.06091989034				0		0.1321877065				0.1056524036				

TABLE XXXIII. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 3 (PART 2)

Category	Metric	session 5		session 6			session 7			session 8		
	number of syllables	14	30	30	49	71	56	24	27	14	13	10
	number of silent pauses	0	1	0	3	7	3	0	3	2	0	1
	total duration (s)	4.19	6.23	7.72	13.49	20.94	14.12	5.37	7.22	4.79	3.04	2.81
	phonation time (s)	4.19	5.81	7.72	12.36	17.38	12.93	5.37	6.33	3.33	3.04	2.28
	speech rate	3.34	4.82	3.89	3.63	3.39	3.97	4.47	3.74	2.92	4.27	3.56
	articulation rate	3.34	5.16	3.82	3.89	3.97	4.33	4.47	4.27	4.2	4.27	4.39
	ASD	0.194	0.259	0.262	0.257	0.252	0.231	0.224	0.234	0.238	0.234	0.228
	number of repairs	0	1	1	2	3	3	1	1	0	1	0
Speed Fluency	Speech rate (syllables divided per total time)	3.34	4.82	3.89	3.63	3.39	3.97	4.47	3.74	2.92	4.27	3.56
	Mean speech rate of the session	4.222648752		3.558718861			4.005990266			3.477443609		
	Articulation rate (syllables divided by phonation time)	3.34	5.16	3.82	3.89	3.97	4.33	4.47	4.27	4.2	4.27	4.39
	Mean articulation rate of the session	4.4		4.004271223			4.344295575			4.277456647		
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	14	15	30	12.25	8.875	14	24	6.75	4.666	13	5
	Mean length of utterance of the session (in syllables)	14.66666667		11.53846154			11.88888889			6.166666667		
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	4.19	2.905	7.72	3.09	2.1725	3.232	5.37	1.582	1.11	3.04	1.14
	Mean length of utterance of the session (in seconds)	3.333333333		2.881538462			2.736666667			1.441666667		
	Number of pauses per second (total time)	0	0.160	0	0.2223	0.3342	0.212	0	0.415	0.4175	0	0.3558
	Mean number of pauses per second per session (total time)	0.095969289		0.2372479241			0.2246349682			0.2819548872		
	Number of pauses per second (speaking time)	0	0.172	0	0.2427	0.4027	0.232	0	0.473	0.6006	0	0.4385
	Mean number of pauses per second per session (speaking time)	0.1		0.2669514148			0.2436053593			0.3468208092		
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.21	0	0.2825	0.445	0.297	0	0.222	0.4866	0	0.265
	Mean pause duration of the session	0.14		0.3607692308			0.2311111111			0.3316666667		
	Phonation time ratio (phonation time divided by total time)	1	0.9324	1	0.9162	0.8299	0.915	1	0.876	0.6951	1	0.8113
	Mean phonation time ratio per session	0.959692898		0.8887307236			0.9221265444			0.8129699248		
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	14	15	30	12.25	8.875	14	24	6.75	4.666	13	5
	Mean length of runs per session	14.66666667		11.53846154			11.88888889			6.166666667		
Repair Fluency	Number of repairs per second (phonation time)	0	0.172	0.1295	0.1618	0.1726	0.232	0.186	0.157	0	0.3289	0
	Mean number of repairs per second per session (phonation time)	0.1		0.1601708489			0.2030044661			0.1156069364		

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TABLE XXXIV.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 4 (PART 1)

		session 1					session 2		session 3				
	number of syllables	8	49	26	40	46	34	23	14	44	18	60	43
	number of silent pauses	0	0	0	0	0	1	0	0	1	1	2	7
	total duration (s)	2.23	12.66	6.28	9.31	11.87	9.94	6.91	4.19	12.63	5.84	14.01	15.97
	phonation time (s)	2.23	12.66	6.28	9.31	11.87	9.51	6.91	4.19	12.36	5.41	12.9	11.55
	speech rate	3.58	3.87	4.14	4.3	3.87	3.42	3.33	3.34	3.48	3.08	4.28	2.69
	articulation rate	3.58	3.87	4.14	4.3	3.87	3.58	3.33	3.34	3.56	3.33	4.65	3.72
	ASD	0.279	0.258	0.242	0.233	0.258	0.28	0.3	0.299	0.281	0.3	0.215	0.269
	number of repairs	0	3	0	0	0	1	0	1	2	0	0	1
Speed Fluency	Speech rate (syllables divided per total time)	3.58	3.87	4.14	4.3	3.87	3.42	3.33	3.34	3.48	3.08	4.28	2.69
	Mean speech rate of the session	3.9905549					3.38278931		3.400455927				
	Articulation rate (syllables divided by phonation time)	3.58	3.87	4.14	4.3	3.87	3.58	3.33	3.34	3.56	3.33	4.65	3.72
	Mean articulation rate of the session	3.9905549					3.47137637		3.856927386				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	8	49	26	40	46	17	23	14	22	9	20	5.375
	Mean length of utterance of the session (in syllables)	33.8					19		11.1875				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.23	12.66	6.28	9.31	11.87	4.755	6.91	4.19	6.18	2.705	4.3	1.443
	Mean length of utterance of the session (in seconds)	8.47					5.47333333		2.900625				
	Number of pauses per second (total time)	0	0	0	0	0	0.100	0	0	0.079	0.171	0.142	0.438
	Mean number of pauses per second per session (total time)	0					0.05934718		0.2089665653				
	Number of pauses per second (speaking time)	0	0	0	0	0	0.105	0	0	0.080	0.184	0.155	0.606
	Mean number of pauses per second per session (speaking time)	0					0.06090133		0.2370178841				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0	0.215	0	0	0.135	0.215	0.37	0.552
	Mean pause duration of the session	0					0.14333333		0.389375				
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	1	0.956	1	1	0.978	0.926	0.920	0.723
	Mean phonation time ratio per session	1					0.97448071		0.8816489362				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	8	49	26	40	46	17	23	14	22	9	20	5.375
	Mean length of runs per session	33.8					19		11.1875				
Repair Fluency	Number of repairs per second (phonation time)	0	0.236	0	0	0	0.105	0	0.238	0.161	0	0	0.086
	Mean number of repairs per second per session (phonation time)	0.07083825266					0.06090133		0.08618832148				

TABLE XXXV.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 4 (PART 2)

		session 4		session5	session6	session7	session 8			
	number of syllables	39	13	/	/	15	13	14	22	52
	number of silent pauses	2	1	/	/	0	1	3	0	4
	total duration (s)	11.69	3.17	/	/	4.64	3.38	4.64	5.31	14.27
	phonation time (s)	9.78	2.9	/	/	4.64	2.79	3.45	5.31	11.73
	speech rate	3.34	4.1	/	/	3.24	3.84	3.02	4.14	3.64
	articulation rate	3.99	4.48	/	/	3.24	4.66	4.06	4.14	4.43
	ASD	0.251	0.223	/	/	0.309	0.214	0.247	0.242	0.226
	number of repairs	2	0	/	/	0	1	0	0	1
Speed Fluency	Speech rate (syllables divided per total time)	3.34	4.1	/	/	3.24	3.84	3.02	4.14	3.64
	Mean speech rate of the session	3.499327052		/	/	3.24	3.65942029			
	Articulation rate (syllables divided by phonation time)	3.99	4.48	/	/	3.24	4.66	4.06	4.14	4.43
	Mean articulation rate of the session	4.100946372		/	/	3.24	4.338487973			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	13	6.5	/	/	15	6.5	3.5	22	10.4
	Mean length of utterance of the session (in syllables)	10.4		/	/	15	8.416666667			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	3.26	1.45	/	/	4.64	1.395	0.8625	5.31	2.346
	Mean length of utterance of the session (in seconds)	2.536		/	/	4.64	1.94			
	Number of pauses per second (total time)	0.171	0.3154	/	/	0	0.2958	0.6465	0	0.2803
	Mean number of pauses per second per session (total time)	0.201884253		/	/	0	0.2898550725			
	Number of pauses per second (speaking time)	0.2044	0.3448	/	/	0	0.3584	0.8695	0	0.3410
	Mean number of pauses per second per session (speaking time)	0.2365930599		/	/	0	0.3436426117			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.6366	0.135	/	/	0	0.295	0.2975	0	0.508
	Mean pause duration of the session	0.436		/	/	0	0.36			
	Phonation time ratio (phonation time divided by total time)	0.8366	0.9148	/	/	1	0.8254	0.7435	1	0.8220
	Mean phonation time ratio per session	0.8532974428		/	/	1	0.8434782609			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	13	6.5	/	/	15	6.5	3.5	22	10.4
	Mean length of runs per session	10.4		/	/	15	8.416666667			
Repair Fluency	Number of repairs per second (phonation time)	0.2044	0	/	/	0	0.3584	0	0	0.0852
	Mean number of repairs per second per session (phonation time)	0.1577287066		/	/	0	0.08591065292			

TABLE XXXVI. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 5 (PART 1)

		session 1				session 2					session 3									
	number of syllables	24	15	36	25	17	15	39	15	28	22	9	13	29	17	38	38	35	42	55
	number of silent pauses	4	0	1	2	0	1	8	1	1	0	1	1	3	0	1	1	1	1	0
	total duration (s)	10.12	3.46	8.71	8.08	3.96	3.62	12.34	4.09	6.05	5.86	3.77	3.8	8.66	4.4	10.25	10.75	11.06	10.3	14.04
	phonation time (s)	6.12	3.46	7.8	7.51	3.96	2.8	9	3.41	5.61	5.86	3.52	3.48	7.36	4.4	9.3	10.4	10.66	9.92	14.04
	speech rate	2.37	4.34	4.13	3.09	4.3	4.15	3.16	3.67	4.63	3.75	2.39	3.42	3.35	3.86	3.71	3.54	3.16	4.08	3.92
	articulation rate	3.92	4.34	4.62	3.33	4.3	5.36	4.33	4.4	4.99	3.75	2.56	3.74	3.94	3.86	4.09	3.66	3.28	4.23	3.92
	ASD	0.255	0.231	0.217	0.3	0.233	0.187	0.231	0.227	0.201	0.267	0.391	0.268	0.254	0.259	0.245	0.274	0.305	0.236	0.255
	number of repairs	1	0	3	1	1	1	3	0	1	0	1	1	1	1	1	0	3	1	1
Speed Fluency	Speech rate (syllables divided per total time)	2.37	4.34	4.13	3.09	4.3	4.15	3.16	3.67	4.63	3.75	2.39	3.42	3.35	3.86	3.71	3.54	3.16	4.08	3.92
	Mean speech rate of the session	2.871870398				3.735325507					3.595126071									
	Articulation rate (syllables divided by phonation time)	3.92	4.34	4.62	3.33	4.3	5.36	4.33	4.4	4.99	3.75	2.56	3.74	3.94	3.86	4.09	3.66	3.28	4.23	3.92
	Mean articulation rate of the session	4.070981211				5.419634562					3.775019002									
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	4.8	15	18	8.333	17	7.5	4.333	7.5	14	22	4.5	6.5	7.25	17	19	19	17.5	21	55
	Mean length of utterance of the session (in syllables)	6.5				8.333333333					15.68421053									
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	1.224	3.46	3.9	2.503	3.96	1.4	1	1.705	2.805	5.86	1.76	1.74	1.84	4.4	4.65	5.2	5.33	4.96	14.04
	Mean length of utterance of the session (in seconds)	1.596666667				1.537619048					4.154736842									
	Number of pauses per second (total time)	0.395	0	0.114	0.247	0	0.276	0.648	0.244	0.165	0	0.265	0.263	0.346	0	0.097	0.093	0.090	0.097	0
	Mean number of pauses per second per session (total time)	0.29455081				0.2988260406					0.108577633									
	Number of pauses per second (speaking time)	0.653	0	0.128	0.266	0	0.357	0.888	0.293	0.178	0	0.284	0.287	0.407	0	0.107	0.096	0.093	0.100	0
	Mean number of pauses per second per session (speaking time)	0.417536534				0.4335707649					0.114010641									
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.8	0	0.455	0.19	0	0.41	0.371	0.34	0.22	0	0.125	0.16	0.325	0	0.475	0.175	0.2	0.19	0
	Mean pause duration of the session	0.666666666				0.6933333333					0.2078947368									
	Phonation time ratio (phonation time divided by total time)	0.604	1	0.895	0.929	1	0.773	0.729	0.833	0.927	1	0.933	0.915	0.849	1	0.907	0.967	0.963	0.963	1
	Mean phonation time ratio per session	0.70544919				0.6892209178					0.9523464833									
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	4.8	15	18	8.333	17	7.5	4.333	7.5	14	22	4.5	6.5	7.25	17	19	19	17.5	21	55
	Mean length of runs per session	6.5				8.333333333					15.68421053									
Repair Fluency	Number of repairs per second (phonation time)	0.163	0	0.384	0.133	0.252	0.357	0.333	0	0.178	0	0.284	0.287	0.135	0.227	0.107	0	0.281	0.100	0.071
	Mean number of repairs per second per session (phonation time)	0.104384133				0.3096934035					0.12667849									

TABLE XXXVII. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 5 (PART 2)

		session 4							session 5			
	number of syllables	54	64	42	41	81	15	38	66	21	77	35
	number of silent pauses	4	5	0	2	4	1	0	2	0	4	3
	total duration (s)	14.93	17.12	8.71	8.89	18.79	4.66	9.76	15.84	6.62	16.76	9.31
	phonation time (s)	13.23	14.87	8.71	7.73	16.31	4.37	9.76	13.87	6.21	15.04	7.19
	speech rate	3.62	3.74	4.82	4.61	4.31	3.22	3.9	4.17	3.17	4.6	3.76
	articulation rate	4.08	4.31	4.82	5.3	4.97	3.43	3.9	4.76	3.38	5.12	4.87
	ASD	0.245	0.232	0.207	0.189	0.201	0.292	0.257	0.21	0.296	0.195	0.205
	number of repairs	2	4	2	3	5	1	1	2	3	1	1
Speed Fluency	Speech rate (syllables divided per total time)	3.62	3.74	4.82	4.61	4.31	3.22	3.9	4.17	3.17	4.6	3.76
	Mean speech rate of the session	4.042964036							4.100556357			
	Articulation rate (syllables divided by phonation time)	4.08	4.31	4.82	5.3	4.97	3.43	3.9	4.76	3.38	5.12	4.87
	Mean articulation rate of the session	4.467858095							4.703379816			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	10.8	10.66	42	13.66	16.2	7.5	38	22	21	15.4	8.75
	Mean length of utterance of the session (in syllables)	14.56521739							15.30769231			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.646	2.478	8.71	2.576	3.262	2.185	9.76	4.623	6.21	3.008	1.7975
	Mean length of utterance of the session (in seconds)	3.26							3.254615385			
	Number of pauses per second (total time)	0.267	0.292	0	0.224	0.212	0.214	0	0.126	0	0.238	0.322
	Mean number of pauses per second per session (total time)	0.1930967898							0.1854522975			
	Number of pauses per second (speaking time)	0.302	0.336	0	0.258	0.245	0.228	0	0.144	0	0.265	0.417
	Mean number of pauses per second per session (speaking time)	0.2133902374							0.2127156701			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.34	0.375	0	0.386	0.496	0.145	0	0.656	0.41	0.344	0.53
	Mean pause duration of the session	0.3426086957							0.4784615385			
	Phonation time ratio (phonation time divided by total time)	0.886	0.868	1	0.869	0.868	0.937	1	0.875	0.938	0.897	0.772
	Mean phonation time ratio per session	0.904899831							0.8718318566			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	10.8	10.66	42	13.66	16.2	7.5	38	22	21	15.4	8.75
	Mean length of runs per session	14.56521739							15.30769231			
Repair Fluency	Number of repairs per second (phonation time)	0.151	0.268	0.229	0.388	0.306	0.228	0.102	0.144	0.483	0.066	0.139
	Mean number of repairs per second per session (phonation time)	0.2400640171							0.1654455212			

TABLE XXXVIII.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 5 (PART 3)

		session 6							session7	session 8				
	number of syllables	12	22	85	15	30	26	35	77	25	11	23	20	40
	number of silent pauses	0	0	5	0	0	2	2	9	1	2	0	3	2
	total duration (s)	2.65	6.41	20.26	4.19	8.06	7.8	10.91	21.85	5.94	3.62	4.77	6.23	11.56
	phonation time (s)	2.65	6.41	17.89	4.19	8.06	6.21	9.24	16.68	5.69	2.24	4.77	4.71	10.37
	speech rate	4.53	3.43	4.2	3.58	3.72	3.33	3.21	3.52	4.21	3.04	4.83	3.21	3.46
	articulation rate	4.53	3.43	4.75	3.58	3.72	4.19	3.79	4.62	4.4	4.91	4.83	4.25	3.86
	ASD	0.221	0.291	0.21	0.279	0.269	0.239	0.264	0.217	0.227	0.204	0.207	0.235	0.259
	number of repairs	1	2	3	1	2	0	2	1	1	1	0	2	3
Speed Fluency	Speech rate (syllables divided per total time)	4.53	3.43	4.2	3.58	3.72	3.33	3.21	3.52	4.21	3.04	4.83	3.21	3.46
	Mean speech rate of the session	3.732581287							3.52	3.704856787				
	Articulation rate (syllables divided by phonation time)	4.53	3.43	4.75	3.58	3.72	4.19	3.79	4.62	4.4	4.91	4.83	4.25	3.86
	Mean articulation rate of the session	4.117108875							4.62	4.283657307				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	12	22	14.166	15	30	8.6666	11.666	7.7	12.5	3.6666	23	5	13.333
	Mean length of utterance of the session (in syllables)	14.0625							7.7	9.153846154				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	2.65	6.41	2.9816	4.19	8.06	2.07	3.08	1.668	2.845	0.7466	4.77	1.1775	3.4566
	Mean length of utterance of the session (in seconds)	3.415625							1.668	2.136923077				
	Number of pauses per second (total time)	0	0	0.2467	0	0	0.2564	0.1833	0.411899	0.1683	0.5524	0	0.4815	0.1730
	Mean number of pauses per second per session (total time)	0.1493032515							0.4118	0.2490660025				
	Number of pauses per second (speaking time)	0	0	0.2794	0	0	0.3220	0.2164	0.539568	0.1757	0.8928	0	0.6369	0.1928
	Mean number of pauses per second per session (speaking time)	0.164684355							0.5395	0.2879769618				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0.395	0	0	0.53	0.5566	0.517	0.125	0.46	0	0.38	0.3966
	Mean pause duration of the session	0.351875							0.517	0.3338461538				
	Phonation time ratio (phonation time divided by total time)	1	1	0.8830	1	1	0.7961	0.8469	0.763386	0.9579	0.6187	1	0.756	0.8970
	Mean phonation time ratio per session	0.9066025216							0.7633	0.8648816936				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	12	22	14.166	15	30	8.6666	11.666	7.7	12.5	3.6666	23	5	13.333
	Mean length of runs per session	14.0625							7.7	9.153846154				
Repair Fluency	Number of repairs per second (phonation time)	0.3773	0.3120	0.1676	0.2386	0.2481	0	0.2164	0.059952	0.1757	0.4464	0	0.4246	0.2892
	Mean number of repairs per second per session (phonation time)	0.2012808783							0.06	0.2519798416				

TABLE XXXIX.   RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 6 (PART 1)

		session 1		session 2			
	number of syllables	37	41	42	23	30	22
	number of silent pauses	0	0	0	0	2	0
	total duration (s)	7.22	7.95	9.18	4.11	6.78	6.41
	phonation time (s)	7.22	7.95	9.18	4.11	5.9	6.41
	speech rate	5.12	5.16	4.57	5.59	4.43	3.43
	articulation rate	5.12	5.16	4.57	5.59	5.09	3.43
	ASD	0.195	0.194	0.219	0.179	0.197	0.291
	number of repairs	1	1	1	2	2	0
Speed Fluency	Speech rate (syllables divided per total time)	5.12	5.16	4.57	5.59	4.43	3.43
	Mean speech rate of the session	5.141727093		4.418429003			
	Articulation rate (syllables divided by phonation time)	5.12	5.16	4.57	5.59	5.09	3.43
	Mean articulation rate of the session	5.141727093		4.5703125			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	37	41	42	23	10	22
	Mean length of utterance of the session (in syllables)	39		19.5			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	7.22	7.95	9.18	4.11	1.966	6.41
	Mean length of utterance of the session (in seconds)	7.585		4.266666667			
	Number of pauses per second (total time)	0	0	0	0	0.294	0
	Mean number of pauses per second per session (total time)	0		0.07552870091			
	Number of pauses per second (speaking time)	0	0	0	0	0.338	0
	Mean number of pauses per second per session (speaking time)	0		0.078125			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0	0	0	0.293	0
	Mean pause duration of the session	0		0.1466666667			
	Phonation time ratio (phonation time divided by total time)	1	1	1	1	0.870	1
	Mean phonation time ratio per session	1		0.9667673716			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	37	41	42	23	10	22
	Mean length of runs per session	39		19.5			
Repair Fluency	Number of repairs per second (phonation time)	0.1385	0.1257	0.108	0.486	0.338	0
	Mean number of repairs per second per session (phonation time)	0.1318391562		0.1953125			

TABLE XL. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 6 (PART 2)

		session 3												
	number of syllables	57	45	15	54	48	24	39	18	13	39	35	30	53
	number of silent pauses	1	0	0	4	0	1	1	0	0	2	0	0	0
	total duration (s)	16.34	10.49	4.79	14.04	10.38	5.08	10.54	3.83	3.38	8.95	7.09	5.42	11.58
	phonation time (s)	16.05	10.49	4.79	12.3	10.38	4.82	9.88	3.83	3.38	8.13	7.09	5.42	11.58
	speech rate	3.49	4.29	3.13	3.85	4.62	4.72	3.7	4.7	3.84	4.36	4.94	5.54	4.58
	articulation rate	3.55	4.29	3.13	4.39	4.62	4.98	3.95	4.7	3.84	4.8	4.94	5.54	4.58
	ASD	0.282	0.233	0.319	0.228	0.216	0.201	0.253	0.213	0.26	0.208	0.203	0.181	0.219
	number of repairs	3	1	1	5	2	1	2	0	0	3	2	2	4
Speed Fluency	Speech rate (syllables divided per total time)	3.49	4.29	3.13	3.85	4.62	4.72	3.7	4.7	3.84	4.36	4.94	5.54	4.58
	Mean speech rate of the session	4.199803413												
	Articulation rate (syllables divided by phonation time)	3.55	4.29	3.13	4.39	4.62	4.98	3.95	4.7	3.84	4.8	4.94	5.54	4.58
	Mean articulation rate of the session	4.346217866												
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	28.5	45	15	10.8	48	12	19.5	18	13	13	35	30	53
	Mean length of utterance of the session (in syllables)	21.36363636												
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	8.025	10.49	4.79	2.46	10.38	2.41	4.94	3.83	3.38	2.71	7.09	5.42	11.58
	Mean length of utterance of the session (in seconds)	4.915454545												
	Number of pauses per second (total time)	0.061	0	0	0.284	0	0.196	0.094	0	0	0.223	0	0	0
	Mean number of pauses per second per session (total time)	0.08042176749												
	Number of pauses per second (speaking time)	0.062	0	0	0.325	0	0.207	0.101	0	0	0.246	0	0	0
	Mean number of pauses per second per session (speaking time)	0.08322544849												
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.145	0	0	0.348	0	0.13	0.33	0	0	0.273	0	0	0
	Mean pause duration of the session	0.1713636364												
	Phonation time ratio (phonation time divided by total time)	0.982	1	1	0.876	1	0.948	0.937	1	1	0.908	1	1	1
	Mean phonation time ratio per session	0.9663122152												
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	28.5	45	15	10.8	48	12	19.5	18	13	13	35	30	53
	Mean length of runs per session	21.36363636												
Repair Fluency	Number of repairs per second (phonation time)	0.186	0.095	0.208	0.406	0.192	0.207	0.202	0	0	0.369	0.282	0.369	0.345
	Mean number of repairs per second per session (phonation time)	0.2404290734												

TABLE XLI. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 6 (PART 3)

		session 4								session 5						
	number of syllables	49	14	46	30	23	64	16	16	39	17	51	124	54	27	39
	number of silent pauses	1	0	2	0	0	3	0	0	0	0	0	4	0	0	0
	total duration (s)	10.75	3.7	12.05	5.03	5.11	16.26	4.32	3.36	8.16	2.62	10.15	28.2	11.53	4.61	7.3
	phonation time (s)	10.35	3.7	10.9	5.03	5.11	14.56	4.32	3.36	8.16	2.62	9.87	26.1	11.53	4.61	7.3
	speech rate	4.56	3.79	3.82	5.97	4.5	3.94	3.7	4.77	4.78	6.48	5.03	4.4	4.68	5.86	5.34
	articulation rate	4.74	3.79	4.22	5.97	4.5	4.39	3.7	4.77	4.78	6.48	5.17	4.75	4.68	5.86	5.34
	ASD	0.211	0.264	0.237	0.168	0.222	0.228	0.27	0.21	0.209	0.154	0.194	0.211	0.214	0.171	0.187
	number of repairs	5	2	3	1	1	2	2	0	2	1	3	6	4	3	2
Speed Fluency	Speech rate (syllables divided per total time)	4.56	3.79	3.82	5.97	4.5	3.94	3.7	4.77	4.78	6.48	5.03	4.4	4.68	5.86	5.34
	Mean speech rate of the session	4.258831297								4.836709384						
	Articulation rate (syllables divided by phonation time)	4.74	3.79	4.22	5.97	4.5	4.39	3.7	4.77	4.78	6.48	5.17	4.75	4.68	5.86	5.34
	Mean articulation rate of the session	4.500261643								5.000712352						
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	24.5	14	15.33	30	23	16	16	16	39	17	51	24.8	54	27	39
	Mean length of utterance of the session (in syllables)	18.42857143								31.90909091						
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	5.175	3.7	3.633	5.03	5.11	3.64	4.32	3.36	8.16	2.62	9.87	5.22	11.53	4.61	7.3
	Mean length of utterance of the session (in seconds)	4.095								6.380909091						
	Number of pauses per second (total time)	0.093	0	0.165	0	0	0.184	0	0	0	0	0	0.1418	0	0	0
	Mean number of pauses per second per session (total time)	0.09904258831								0.05511919526						
	Number of pauses per second (speaking time)	0.096	0	0.183	0	0	0.206	0	0	0	0	0	0.1532	0	0	0
	Mean number of pauses per second per session (speaking time)	0.1046572475								0.05698817495						
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.2	0	0.383	0	0	0.425	0	0	0	0	0.28	0.42	0	0	0
	Mean pause duration of the session	0.2321428571								0.2163636364						
	Phonation time ratio (phonation time divided by total time)	0.962	1	0.904	1	1	0.895	1	1	1	1	0.9724	0.9255	1	1	1
	Mean phonation time ratio per session	0.9463519313								0.9672040788						
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	24.5	14	15.33	30	23	16	16	16	39	17	51	24.8	54	27	39
	Mean length of runs per session	18.42857143								31.90909091						
Repair Fluency	Number of repairs per second (phonation time)	0.483	0.540	0.275	0.198	0.195	0.137	0.462	0	0.2450	0.3816	0.3039	0.2298	0.3469	0.6507	0.2739
	Mean number of repairs per second per session (phonation time)	0.2790859934								0.2991879185						

TABLE XLII. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 6 (PART 4)

		session 6									
	number of syllables	16	11	39	30	78	45	37	19	15	18
	number of silent pauses	0	0	1	0	1	4	1	1	0	0
	total duration (s)	4.06	2.36	9.13	7.95	17.83	10.8	8.06	5.03	2.7	4.19
	phonation time (s)	4.06	2.07	8.82	7.95	16.79	8.38	7.2	4.37	2.7	3.88
	speech rate	3.94	4.66	4.27	3.77	4.38	4.17	4.59	3.78	5.55	4.29
	articulation rate	3.94	5.32	3.77	3.77	4.65	5.37	5.14	4.35	5.55	4.64
	ASD	0.254	0.188	0.226	0.265	0.215	0.186	0.195	0.23	0.18	0.216
	number of repairs	0	0	3	2	5	5	1	2	0	2
Speed Fluency	Speech rate (syllables divided per total time)	3.94	4.66	4.27	3.77	4.38	4.17	4.59	3.78	5.55	4.29
	Mean speech rate of the session	4.271252254									
	Articulation rate (syllables divided by phonation time)	3.94	5.32	3.77	3.77	4.65	5.37	5.14	4.35	5.55	4.64
	Mean articulation rate of the session	4.651162791									
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	16	11	19.5	30	39	9	18.5	9.5	15	18
	Mean length of utterance of the session (in syllables)	17.11111111									
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	4.06	2.07	4.41	7.95	8.395	1.676	3.6	2.185	2.7	3.88
	Mean length of utterance of the session (in seconds)	3.678888889									
	Number of pauses per second (total time)	0	0	0.1095	0	0.0560	0.3703	0.1240	0.1988	0	0
	Mean number of pauses per second per session (total time)	0.110941617									
	Number of pauses per second (speaking time)	0	0	0.1133	0	0.0595	0.4773	0.1388	0.2288	0	0
	Mean number of pauses per second per session (speaking time)	0.1208094231									
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.29	0.155	0	0.52	0.484	0.43	0.33	0	0.31
	Mean pause duration of the session	0.3272222222									
	Phonation time ratio (phonation time divided by total time)	1	0.8771	0.9660	1	0.9410	0.7759	0.8933	0.8687	1	0.9260
	Mean phonation time ratio per session	0.9183192345									
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	16	11	19.5	30	39	9	18.5	9.5	15	18
	Mean length of runs per session	17.11111111									
Repair Fluency	Number of repairs per second (phonation time)	0	0	0.3401	0.2515	0.2977	0.5966	0.1388	0.4576	0	0.5154
	Mean number of repairs per second per session (phonation time)	0.3020235578									

TABLE XLIII. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 6 (PART 5)

		session 7								session 8				
	number of syllables	24	55	52	18	13	16	28	40	22	32	40	23	27
	number of silent pauses	4	4	4	1	0	0	0	0	1	2	0	3	1
	total duration (s)	8.61	14.17	16.05	5.37	3.09	3.62	6.59	9.02	6.57	8.95	9.44	8.97	8.48
	phonation time (s)	6.44	11.49	13.06	4.68	3.09	3.62	6.59	9.02	6.25	8.11	8.9	5.95	7.77
	speech rate	2.79	3.88	3.24	3.35	4.2	4.42	4.25	4.43	3.35	3.58	4.24	2.56	3.19
	articulation rate	3.73	4.79	3.98	3.85	4.2	4.42	4.25	4.43	3.52	3.94	4.5	3.86	3.48
	ASD	0.268	0.209	0.251	0.26	0.238	0.226	0.236	0.226	0.284	0.254	0.222	0.259	0.288
	number of repairs	3	3	4	3	2	0	1	3	2	2	2	3	4
Speed Fluency	Speech rate (syllables divided per total time)	2.79	3.88	3.24	3.35	4.2	4.42	4.25	4.43	3.35	3.58	4.24	2.56	3.19
	Mean speech rate of the session	3.698135899								3.395425607				
	Articulation rate (syllables divided by phonation time)	3.73	4.79	3.98	3.85	4.2	4.42	4.25	4.43	3.52	3.94	4.5	3.86	3.48
	Mean articulation rate of the session	4.242110709								3.893996755				
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	4.8	11	10.4	9	13	16	28	40	11	10.666	40	5.75	13.5
	Mean length of utterance of the session (in syllables)	11.71428571								12				
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	1.288	2.298	2.612	2.34	3.09	3.62	6.59	9.02	3.125	2.7033	8.9	1.4875	3.885
	Mean length of utterance of the session (in seconds)	2.761428571								3.081666667				
	Number of pauses per second (total time)	0.4645	0.2822	0.2492	0.1862	0	0	0	0	0.1522	0.2234	0	0.3344	0.1179
	Mean number of pauses per second per session (total time)	0.1954299459								0.1650554115				
	Number of pauses per second (speaking time)	0.6211	0.3481	0.3062	0.2136	0	0	0	0	0.16	0.2466	0	0.5042	0.1287
	Mean number of pauses per second per session (speaking time)	0.2241765822								0.1892915089				
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0.434	0.536	0.598	0.345	0	0	0	0	0.16	0.28	0.54	0.755	0.355
	Mean pause duration of the session	0.4061904762								0.4525				
	Phonation time ratio (phonation time divided by total time)	0.7479	0.8108	0.8137	0.8715	1	1	1	1	0.9512	0.9061	0.9427	0.6633	0.9162
	Mean phonation time ratio per session	0.8717678894								0.8719641594				
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	4.8	11	10.4	9	13	16	28	40	11	10.666	40	5.75	13.5
	Mean length of runs per session	11.71428571								12				
Repair Fluency	Number of repairs per second (phonation time)	0.4658	0.2610	0.3062	0.6410	0.6472	0	0.1517	0.3325	0.32	0.2466	0.2247	0.5042	0.5148
	Mean number of repairs per second per session (phonation time)	0.327642697								0.3515413737				

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TABLE XLIV. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 7 (PART 1)

		session1	session 2			session 3			session 4	
	number of syllables	46	26	40	27	24	41	93	41	19
	number of silent pauses	0	2	2	2	3	2	10	1	0
	total duration (s)	10.93	6.44	10.3	6.96	8.76	9.94	30.89	11.87	5.89
	phonation time (s)	10.93	5.72	8.77	6.13	6.99	9.07	24.28	10.89	5.89
	speech rate	4.21	4.04	3.88	3.88	2.74	4.13	3.01	3.45	3.23
	articulation rate	4.21	4.55	4.56	4.41	3.43	4.52	3.83	3.77	3.23
	ASD	0.238	0.22	0.219	0.227	0.291	0.221	0.261	0.266	0.31
	number of repairs	0	0	0	1	2	2	3	1	1
Speed Fluency	Speech rate (syllables divided per total time)	4.21	4.04	3.88	3.88	2.74	4.13	3.01	3.45	3.23
	Mean speech rate of the session	4.21	3.924050633			3.186126235			3.378378378	
	Articulation rate (syllables divided by phonation time)	4.21	4.55	4.56	4.41	3.43	4.52	3.83	3.77	3.23
	Mean articulation rate of the session	4.21	4.510184287			3.916707982			3.57568534	
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	46	8.666	13.33	9	6	13.66	8.454	20.5	19
	Mean length of utterance of the session (in syllables)	46	10.33333333			8.777777778			20	
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	10.93	1.906	2.923	2.043	1.747	3.023	2.207	5.445	5.89
	Mean length of utterance of the session (in seconds)	10.93	2.291111111			2.241111111			5.593333333	
	Number of pauses per second (total time)	0	0.310	0.194	0.287	0.342	0.20	0.323	0.084	0
	Mean number of pauses per second per session (total time)	0	0.253164557			0.3024803388			0.056306306	
	Number of pauses per second (speaking time)	0	0.349	0.228	0.326	0.429	0.22	0.41	0.091	0
	Mean number of pauses per second per session (speaking time)	0	0.2909796314			0.3718393654			0.059594755	
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	0	0.24	0.51	0.276	0.442	0.29	0.600	0.49	0
	Mean pause duration of the session	0	0.3422222222			0.5138888889			0.326666666	
	Phonation time ratio (phonation time divided by total time)	1	0.888	0.851	0.880	0.797	0.912	0.786	0.917	1
	Mean phonation time ratio per session	1	0.8700421941			0.8134704578			0.944819819	
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	46	8.666	13.33	9	6	13.66	8.454	20.5	19
	Mean length of runs per session	0	10.33333333			8.777777778			20	
Repair Fluency	Number of repairs per second (phonation time)	46	0	0	0.163	0.286	0.22	0.123	0.091	0.169
	Mean number of repairs per second per session (phonation time)	0	0.04849660524			0.1735250372			0.119189511	

TABLE XLV. RESULT OF UTTERANCE FLUENCY CG PARTICIPANT 7 (PART 2)

		session5	session 6	session7	session 8			
	number of syllables	/	22	67	/	36	37	7	25
	number of silent pauses	/	1	0	/	7	3	0	4
	total duration (s)	/	6.07	20.02	/	14.09	9.55	2.05	8.19
	phonation time (s)	/	5.78	20.02	/	9.45	8.25	2.05	5.79
	speech rate	/	3.62	3.35	/	2.55	3.88	3.42	3.05
	articulation rate	/	3.8	3.35	/	3.81	4.48	3.42	4.32
	ASD	/	0.263	0.299	/	0.263	0.223	0.293	0.232
	number of repairs	/	2	3	/	5	3	0	1
Speed Fluency	Speech rate (syllables divided per total time)	/	3.62	3.35	/	2.55	3.88	3.42	3.05
	Mean speech rate of the session	/	3.411268685		/	3.099173554			
	Articulation rate (syllables divided by phonation time)	/	3.8	3.35	/	3.81	4.48	3.42	4.32
	Mean articulation rate of the session	/	3.449612403		/	4.111198121			
Breakdown Fluency	Mean length of utterance (in syllables) (Number of syllables/(Number of silent pauses+1))	/	11	67	/	4.5	9.25	7	5
	Mean length of utterance of the session (in syllables)	/	29.66666667		/	5.833333333			
	Mean length of utterance (in seconds)(Phonation time/(Number of silent pauses+1))	/	2.89	20.02	/	1.1812	2.0625	2.05	1.158
	Mean length of utterance of the session (in seconds)	/	8.6		/	1.418888889			
	Number of pauses per second (total time)	/	0.164	0	/	0.4968	0.3141	0	0.4884
	Mean number of pauses per second per session (total time)	/	0.038328861		/	0.4132231405			
	Number of pauses per second (speaking time)	/	0.173	0	/	0.7407	0.3636	0	0.6908
	Mean number of pauses per second per session (speaking time)	/	0.038759689		/	0.5481597494			
	Mean pause duration (total length of silent pauses divided by total number of silent pauses+1)	/	0.145	0	/	0.58	0.325	0	0.48
	Mean pause duration of the session	/	0.096666666		/	0.4633333333			
	Phonation time ratio (phonation time divided by total time)	/	0.952	1	/	0.6706	0.8638	1	0.7069
	Mean phonation time ratio per session	/	0.988884630		/	0.753837072			
	Mean length of runs (number of syllables divided by (number of silent pauses+1))	/	11	67	/	4.5	9.25	7	5
	Mean length of runs per session	/	29.66666667		/	5.833333333			
Repair Fluency	Number of repairs per second (phonation time)	/	0.346	0.149	/	0.5291	0.3636	0	0.1727
	Mean number of repairs per second per session (phonation time)	/	0.193798449		/	0.3523884103			

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