THE IMPORTANCE OF SPEECH PAUSES FOR PSYCHOTHERAPEUTICAND FORENSIC OBSERVATIONS

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Abstract: During the psychotherapeutic process, the pauses could "tell" a lot about a patient's personality, problems and experiences. The length and the quality of pauses could be connected with intrapsychic conflicts which a patient tries to "hide" and with the transference too. Looked at from the perspective of the work on dreams and history, pauses could be very useful for the psychotherapist's understanding of the patient. Theoretical concepts are interwoven with the examples from clinical practice. In forensic view, pauses in speech are analysed on a phonetic-linguistic basis. The paper presents the classification of pauses with special reference to *filled pauses*. In these pauses the silence can be filled with a neutral voice /ə:/ or a voice combination /ə:m/. Several examples will indicate their intra-speaker stability as well as inter-speaker variability. Experiments have shown that a certain set of acoustic-phonetic features makes these pauses important forensic markers.

Keywords: pauses in speech, filled pauses, psychotherapy, forensic markers.

INTRODUCTION

Research into the phenomenon of speech pause is primarily related to the development of the theory of speech production (Crystal, 2008). As speech production is influenced by many factors such as sociolinguistic profile of the speaker, cognitive load, psychological status, stress, situational context,

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content, goal and intentions in speech communication, a pause as an element of speech can play a very different role. About importance of a pause in speech communication Mark Twain said: "The right word may be effective, but no word was ever as effective as a rightly timed pause".

In usual communication the speaker may use pauses to enhance the message delivery. He may use a pause to emphasize that the information coming next is important, or to give the audience time to process what he has just said. There are several powerful ways to use the pause to maximum communication effect. For example, the pause before someone starts speaking, the pause to signal that something important is coming, the pause after saying something important, the pause when moving to a new topic, the pause for emphasizing a key point, the pause to get your audience to reflect on an issue, the pause before answering questions, and so on.

The pauses exist in all human languages and cultures, but the meaning of pauses vary between cultures and languages. For instance, Kendall (2009) examined the impact of different factors on pause length and showed that region, gender and ethnicity have significant influences on pause duration. In dialogs in Swedish, Megyesi and Gustafson-Capková (2002) found that pauses in the linguistic context occur mainly at turn taking (28%), but also between phrases, e.g. in front of noun phrases (16%), adverb phrases (10%), conjunctions (10%) and prepositional phrases (9%).

Cognitive aspects of pauses were investigated by Kircher, Brammer, Levelt, Bartels and McGuire (2004) using of functional magnetic resonance imaging (fMRI). It seems that pauses relate to language planning on various levels, and that different types of pauses may be connected to different types of cognitive activities. On the other hand, different types of pauses were investigated in the context of mental condition of a speaker, e.g. schizophrenics make pauses around 10 % more often and around 10 % longer (Rapcan et al., 2010).

The information on pause properties in speech is individualized between speakers and influenced by situational context and linguistic and cognitive tasks. As such, it is meaningful for creating a speaker's psycho-social profile. Pauses in psychotherapy could tell a lot about patient's psychological situation. They could be seen as a kind of diagnostic and prognostic signs. It is not a rare situation that for some people, depending on the quality and intensity of their psychological disorder and/or personality traits, pauses have a special meaning. Making space between words could be perceived (consciously and/or unconsciously) as dangerous. It could enable a control to be loosened or lost and a lot of unwanted things to be said or shown during the session.

A pause in speech is obviously a specific entity that has its cognitive source, psychological modulation and a verbal realization. The observation of this entity could be perceptive (subjective, psychotherapeutic) and objective (acoustics, forensic). This two-dimensionality does not exclude a mutual interaction of these two kinds of observations. On the contrary, joined together they could describe the individuality of a person in a more comprehensive way. From the forensic point of view, pauses in speech could be important forensic markers.

The aim of this paper is to describe the importance of speech pauses, as specific speech-linguistic manifestations, looked at from the psychotherapeutic and forensic aspects and to point out still not enough used potential in their integral characterization of the personality.

TYPES OF PAUSES IN CONTINUOUS SPEECH

There is no consensus on the categorization of speech pauses (Künzel, 1997; Rose, 2002). But, several types of pauses can be recognized based on their form and function. What is mutual for all types of pauses is that they do not affect sentence meaning but perturb utterance fluency.

Silent pauses - Silences occur in conversation for a number of reasons, for example for breathing, thinking, word-searching and turn taking management. Silence can be defined as "complete absence of sound" or "the fact or state of abstaining from speech", whereas a pause is defined as "a temporary stop in action or speech" (New Oxford American Dictionary). So, when a pause is filled with silence we have *silent pauses.*

Filled pauses - Filler sounds are spoken in conversation by one participant to signal to others that he or she has paused to think, but is not yet finished speaking. Different languages have different characteristic filler sounds. The most common filler sounds in English, as well as in Serbian, are /ə:/ and /ə:m/. Possible filler pauses could be realized as prolongation of segments. For example, in Serbian word /*primedba*/ the filled pause could be by prolongation of /i/, /pri:::medba/, or of /m/, /prim:::edba/, or of /d/, /primed:::ba/.

Juncture pauses – Juncture pauses enhance the syntactic and semantic structure of the speech flow and primarily occur between intonation phrases. The sentence usually consists a noun phrase (NF) and a verb phrase (VF). Each phrase might be signalled by a separate intonation phrase and the first juncture pause occurs between these two intonation phrases, while the second pause occurs at the end of the sentence. Usually the juncture pauses are not filled.

Hesitation pauses - When the speaker's brain needs to make cognitive planning in speech process, it usually holds up speech production. This kind of pauses is called hesitation pauses. They can be silent, filled, prolongation or combination of these.

Respiration pauses - In the breathing process the speakers make pauses. Sometimes breath could be too low, similar to a silent pause, and sometimes strong like filled pause.

Turn pauses - In normal conversation speakers can use pauses to indicate that they finished their talk and that their collocutor can respond. This kind of pauses is culture-specific in their duration. Sometimes they can be negative pauses, in the sense that one speaker starts to speak before the other has finished. Such overlapping speech is forensically difficult to analyse.

THE MEANING OF PAUSES IN PSYCHOTHERAPEUTIC PROCESS

Being an introverted intuitive type of a person, Jung (1977) naturally valued and nurtured (besides having a great knowledge of) his patients to have a break while talking and gave them enough time and space to turn inwards – toward their inner world.

Going into the desert (in the inner world) is, for Jung, *sine qua non*, for knowing oneself. "The desert is within you. The desert calls you and draws you back, and if you were fettered to the world of this time with iron, the call of the desert would break all chains. Truly, I prepare you for solitude" (Jung, 2009a). This beautiful quote tells us a lot about how not only valuable but necessary it is to make space, pauses, and brakes from the external world for our psyche. In order to get in contact with our souls, we need to turn the attention inward.

During the psychotherapeutic process, pauses in speech could be seen as:

Manifestations of many important issues which a person is trying to handle and digest.

They are an excellent source of information for the psychotherapist about the patient.

THE MOST IMPORTANT FUNCTIONS OF PAUSES FOR THE PATIENT

1. Making breaks often gives a person the necessary and valuable time to acknowledge and digest the issues that he/she just brought up, what the psychotherapist said or the material that was constellated in the interactive field between them.

2. Surprising insights could evoke a kind of a shock that needs a bit of silence to be recovered from.

3. A newly realized idea about oneself and relationships with others need a pause also in order to stay long enough in the field of the consciousness and to receive a respect they deserve.

4. Very intense feelings that a person is not able to contain at the moment could evoke a blockage and the unconscious closure that does not allow for the difficult material to get out into the "daily light".

5. Getting close to the complex, in the Jungian meaning of the notion (Jung, 1981), not rarely evoke a resistance that could be manifested in long pauses and difficulties to talk about the material in question.

6. When too much psychological energy is being invested in a certain psychological image, feeling, sensation of idea, the channel for expressing it could be too narrow for the flow to burst out and that, paradoxically, can block the flow of the speech for a certain period of time.

7. While taking a pause in speech, a patient could get into contact with his transference feelings (Marshak, 1998) that he otherwise would try to overlook.

8. Before starting to talk about dreams or being engaged in active imagination (Zdravković, Jovičić & Gudurić, 2019), a patient usually makes a pause before entering into another channel of communication.

9. A person in psychotherapy often makes pauses in order to feel one better and to grasp more deeply the issues that are important at that moment. "From endless blue plains you sink into black depths; luminous fish draws you, marvellous branches twine around you from above. You slip through columns and twisting, wavering, dark-leaved plants, and the sea takes you up again in the bright green water to white sandy coasts, and a wave foams you ashore and swallows you back again ..." (Jung, 2009b).

POSSIBLE FUNCTIONS OF PAUSES FOR THE PSYCHOTHERAPIST

1. The timing of the pauses in speech could tell a psychotherapist a lot about the issues that are psychologically important for the person (material connected with the images of Anima, Animus, Shadow, Persona, Ego, Self, etc.) (Papadopoulos, 2006).

2. During the pauses, nonverbal communication could be more visible and even amplified.

3. Psychotherapist could also notice that some patient (more often with a personality disorder on the borderline level of functioning, and of course, psychotic) finds it very hard to express himself symbolically – through words and images.

4. Sometimes, the psychotherapist could notice and sense that the silence during pauses is so dense that it could be "cut with a knife". Staying with that experience for a certain time could make the image to take another channel of communication (Mindell, 1990) that could push, till then, a blocked process of individuation.

5. Based on the quality and frequency of the pauses, the psychotherapist could also form a good enough impression about the amount of distress a patient is facing at that moment.

6. By making pauses in conversation in a relaxed way, a psychotherapist is letting a patient know that it is alright to be silent from time to time and that not speaking could be nurturing and useful experience.

7. Paying attention to the pauses a patient is making, a psychotherapist could get in touch with the vulnerabilities of a patient and could better respect them.

8. Respecting and being with a patient during breaks in speech could get the psychotherapist himself in better contact with his countertransference feelings which are a very useful way of understanding the patient and also himself.

It is not such a rare situation that a synchronicity (Main, 2007) could appear during the pause with intense transference feelings. The example: a patient was avoiding very much to make a brake and to allow himself to stay with his analyst in silence. Once he told the analyst that it is usually very hard for him to be silent and looked at her; but then, he decided to try to do that. The silence was very dense. The analyst could see and feel that the patient was very anxious and nervous, because of the experience he was having, but could not talk about it. Suddenly, there was a loud bang on the street and a big iron bar fell down and made a noise. It was very loud, and since nothing similar ever happened, it was a kind of a shock for him. He experienced that event as something meaningful and somehow connected with the intense feelings that were accumulated inside him. The pressure inside was so intense that this kind of energy burst out and was manifested in the external event. It really felt like synchronicity.

While making a pause long enough, a patient could start noticing sensations in his/her body that could evoke the strong feelings such as anxiety, sadness, anger, emptiness, excitement, happiness, etc. (Rajković, Jovičić**,** Grozdić, Zdravković & Subotić, 2018). These experiences are something that a person was trying to avoid during life before coming to psychotherapy. Pauses in speech, during psychotherapeutic process, could get the patient in contact with the very thing he/she was trying not to see, hear, feel, notice – the suffering.

The feeling of being exposed, of being vulnerable, and even showing the suffering in front of the other, and hence, being open to different influences by the therapist (and whatever he might represent in the experience of a person) is something often hard to bear.

But beyond everything else, at least when we talk about psychotherapy, it is of a crucial significance to bear in mind that each person is a world *per se*. Every symbolic image, every psychological situation that looks the same from the external point of view, have to be seen through the perspective of that particular individual. The same "rule" needs to be applied when we are talking about pauses in speech during psychotherapeutic process. The same length of the pause or tempo of its occurrence could have a different of even completely opposed meaning for two persons. On the other hand, the similar qual-

ity and intensity of distress could be expressed in one person by continuous talking and in the other by long and frequent breaks.

While following a patient's experiences and reactions mostly by qualitative methodology, the forensic approach is much more based on the quantitatively based data. The significance and meaning of the pauses that are being observed in forensics is also different from those in psychotherapy since the purposes of their analysis are not the same. But, there exists one important connection between these two views on speech pauses. Psychological effects on speech cited above in Zdravković and Jovičić (2018) have also repercussions on pauses in speech production, which is important for interpretation of the results in forensic analysis of speech recordings.

It is often a case that within the pauses in speech, different psychological states and emotions could be recognized. Some of them are a sense of insecurity, indecisiveness, anxiety, fear, a psychological pressure, a distress, a need to detach from the emotions and to avoid telling the truth, even speech-linguistic "crutch" words, etc. This, as each psycho-emotional variation, reflects upon acoustic features within a speech signal. In this sense, the acoustic features in speech pauses could "tell" a lot about individual's characteristics and thus become valuable forensic markers.

The example given in following section with the filled pause /ə:/ will demonstrate this connection.

FORENSIC INTERPRETATION OF FILLED PAUSES

Filled pauses are most commonly produced as central vowels /ə, ə̹, ə̟, æ/ with or without a final nasal /n/ or /m/. The most frequent forms of filled pauses are /ə:/ and /ə:m/, in literature represented orthographically as *uh* and *um*. In our consideration we will use notations /ə:/ and /ə:m/. Voice /ə/ (notice the difference between voice /ə/ and the filled pause /ə:/) is also known as *schwa* (neutral voice).

ORIGIN AND REALIZATION OF FILLED PAUSES

To understand filled pauses, let us first call for Levelt's model of speech production (Levelt, Roelofs & Meyer, 1999). Levelt's model consists of three stages: the conceptualizer, the formulator and the articulator. In the conceptualizer stage the intention of the speaker is converted into lexical concepts, in the formulator stage the speaker needs to access the mental lexicon to retrieve the correct words and prepare them through stages of morphological, phonological and phonetic encoding, and in the articulator stage the speaker articulates the necessary sounds. When an utterance is halted in production, because of a problem in one of the three stages, dysfluency occurs manifested as a silent pause, filled pause or lengthening some utterance constituents. There are two views on the origin of filled pauses (Sleebos, 2018). Firstly, filled pauses are the audible representation of dysfluency caused somewhere in Levelt's model and they are assumed as a symptom of a cognitive process. Secondly, filled pauses signal either a minor or major delay in speech production, so they can be accepted as a signal of a cognitive process. In both views filled pauses are directly connected to the cognitive process.

In forensic voice comparison filled pauses offer a number of potential advantages over other segments in speech recordings. For most speakers the filled pauses occur quite frequently in comparison to other speech segments (vowels and consonants). For instance, the average frequency of filled pauses is 3.7 per minute (Tschäpe, Trouvain, Bauer & Jessen, 2005), or the filled pauses occurred on average every

22 syllables in a corpus of spontaneous French (Grosjean & Deschamps, 1973). The filled pauses are typically longer than vowels and they are more stable over time (and easier to measure acoustically). Jessen (2008) emphasized that the filled pauses are usually produced unconsciously because a speaker has relatively little conscious control over them. As a consequence of that a kind of automatism exists in filled pauses production.

As an example of filled pauses, Figure 1 shows typical realization of filled pauses /ə:/ and /ə:m/ in a Serbian short sentence "gde on" realized as "ə: de on ə:m". All three sounds, two /ə:/ and nasal /m/, show very stable formant contours (the contours of spectral concentrates) F1 and F2. However, formant F2 in /ə:/ is evidently higher than in /ə:m/. The voice /ə/ in filled pause /ə:/ is produced before vowel /e/ (plosive /d/ interrupts these two voices, Figure 1, spectrogram) and we hypothesized that the effect of coarticulation (mutual influence of neighbouring voices) causes the increase of formant F2 in /ə:/, so the production of filled pause /ə:/ is moved to production of vowel /e/ (see explanation for Figure 5).

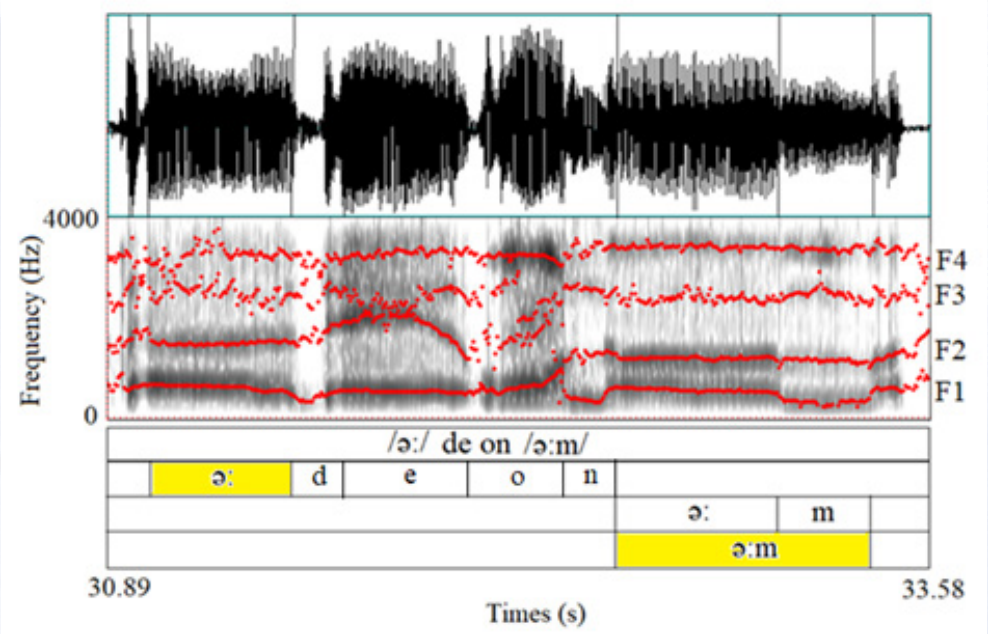


Figure 1. Typical realization of filled pauses /ə:/ and /ə:m/ in Serbian (upper part of figure: waveform of speech signal, middle part: spectrogram of speech signal with formant contours, lower part: transcription of speech signal).

EXPERIMENTAL EVIDENCE

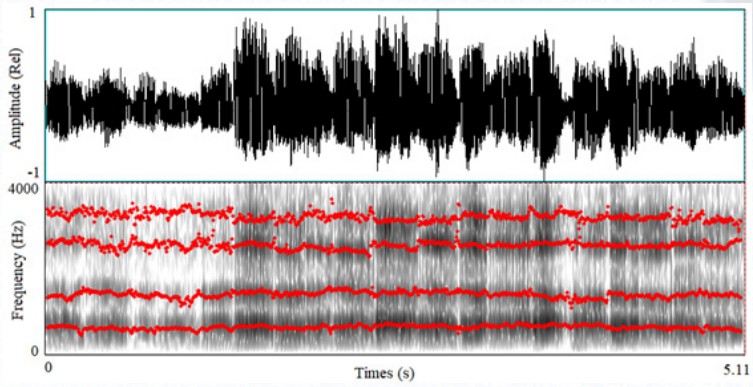
In this section we will demonstrate the typical features of filled pauses in a real forensic case. The case had one suspected recording (the voice of suspected/known person) and ten questioned recordings (the voice of unknown person). Because the Serbian filled pause /ə:/ is most often in use than /ə:m/, we analysed in several details of filled pause /ə:/.

METHODOLOGY

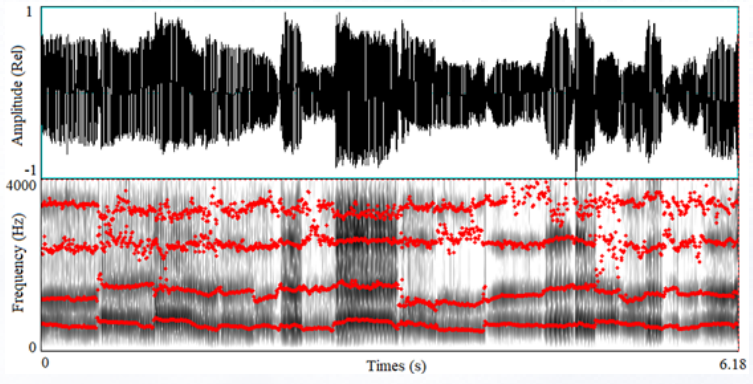
The questioned recordings were obtained from the court and the suspected recording was made in an interview where a suspected person spoke in a declarative style. The recordings were analysed by Praat software (Boersma & Weenink, 2018). All filled pauses /əː/ from suspected voice were selected and connected together in one recording. Also, all filled pauses /əː/ from ten questioned recordings and questioned voices were selected and connected together in another recording. Using Praat software, we analysed formants F1 to F4, long term average spectrum (LTAS), fundamental frequency F0 and distribution of F0.

RESULTS

Figure 2a shows waveform and spectrogram of the selected filled pauses /əː/ from suspected recording and Figure 2b shows the filled pauses /əː/ selected from all questioned recordings. In suspected recording all formants in the filled pauses /əː/, except F4, are very stable, which is shown in Figure 2a. This is the consequence of declarative style in suspected speech, the style without emotions. On the other hand, in the questioned recording all formants in filled pauses /əː/ have clear variability. This is a consequence of different style of speaking of the questioned person from very calm to very emotional (Jovičić & Zdravković, 2019).



a)



b)

Figure 2. Waveforms and spectrum of extracted and connected filled pauses /əː/ in a) suspected recording, and b) questioned recordings.

But *long term average spectrum* (LTAS, Rose, 2002), for both recordings in Figure 2, shows very similar position of all four formants on frequency scale, rounded spectral concentrates in Figure 3. It is obvious that mathematical averaging in this case extracts most likely values of formants in spite of their variability. It appears that spectral characteristics of filled pauses /əː/ are robust to speaking style.

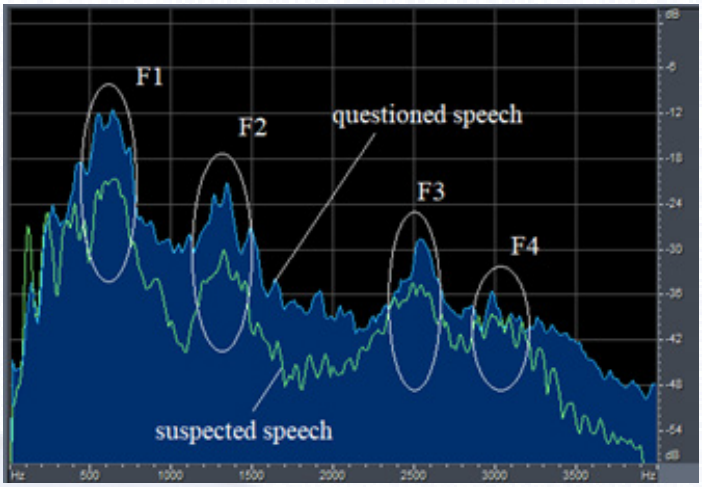
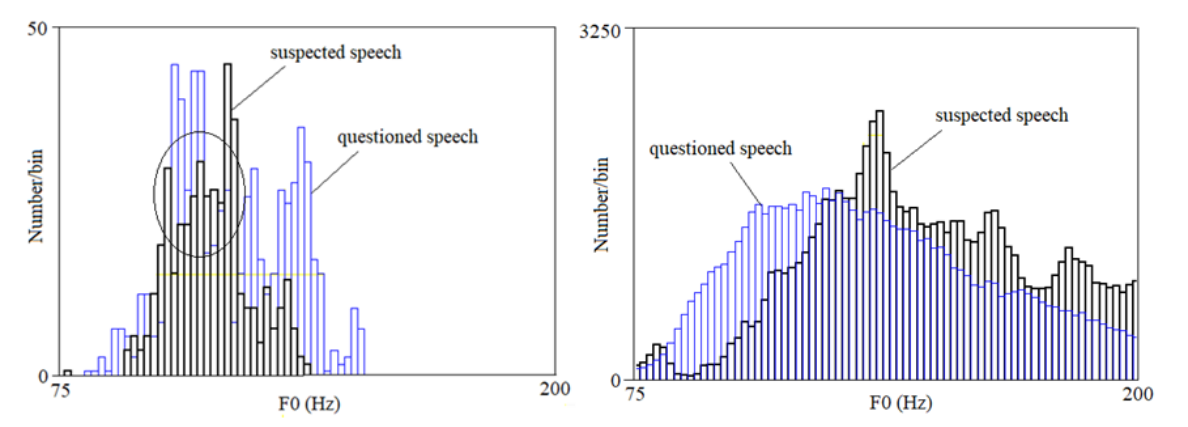


Figure 3. Long term average spectrum of connected filled pauses /əː/ in suspected and questioned recordings.

Distributions of fundamental frequency F0 in suspected and questioned filled pauses /əː/ are shown in Figure 4a. Both histograms have concentrate of highest bins (rounded in Figure 4a) at similar position on F0 scale. Figure 4b shows F0 distributions of complete suspected and questioned recordings including all voiced segments. Histograms have different distributions indicating different speaking style events of the same person in question. That is the difference between filled pauses /əː/ and all other voices in both recordings.



a) b)

Figure 4. F0 distribution for a) suspected and questioned filled pauses /əː/, and b) all suspected and questioned recordings.

These results support the previous viewpoint that the filled pause /əː/ has good potential for forensic voice comparison.

Finally, to support the view about contextual variability of formants in filled pauses /ə:/, noted in Figure 1, we analysed the position of voice /ə/ in articulatory space illustrated by scatter diagram F1-F2 in Figure 5. Scatter diagram presents the distribution of Serbian vowels /a, e, i, o, u/ (Jovičić, 1999) with included formants F1 and F2 of neutral voice /ə/ from the suspected recording (Figure 2a). Voice /ə/ is absolutely in the gap between vowels /e/, /a/ and /o/, so it is real *schwa*. However, depending of coarticulation with the following vowel or word in continuous speech, the voice /ə/ could gravitate to one of three vowels and have its tone. The results in Figure 2b with different positions of formants F1 and F2 support this standpoint.

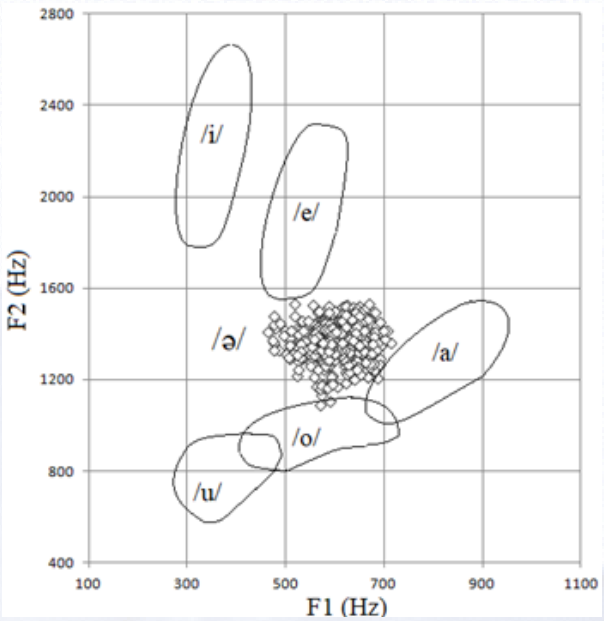


Figure 5. F1-F2 scatter diagram of the Serbian vowels and schwa /ə/ for the suspected voice.

CONCLUSION

In this paper we discussed the speech pauses as individual features interesting for psychotherapeutic processes and forensic voice comparison. Pauses in speech during psychotherapeutic process are very important if observed from the point of view of a patient as well as from the point of view of the analyst. It is possible to define different types and different functions of making breaks during speech. The authors think that the importance of discussing and analysing pauses could be more emphasized, since they could enable psychotherapists to recognize even in this way a lot of valuable issues their patients are facing. But beyond everything else, at least when we talk about psychotherapy, it is of crucial significance to bear in mind that each person is a world *per se*. Every symbolic image, every psychological situation that looks the same from the external point of view, have to be seen through the perspective of that particular individual. The same "rule" needs to be applied when we talk about pauses in speech during psychotherapeutic process. The same length of a pause or tempo of its occurrence could have a different or even completely opposed meaning for two persons. On the other hand, the similar quality and intensity of distress could be expressed in one person by continuous talking and in the other by long and frequent breaks. The pauses during psychotherapy are seen and analysed as often having a deep meaning that describes psychological situation of a patient, his motivations, his symptomatology, the dynamic and structure of his personality, the redistribution of his libido. On the

other hand, pauses is forensics have different objectives that could be measured with great precision and punctuality.

From the forensic point of view a filled pause /ə:/ has important characteristics that can be used as forensic markers. Someone uses the filled pause /ə:/ very often in his verbal expression by force of habit or it is caused by psychological circumstances. Experimental evidence in a real forensic case indicate stable features of /ə:/ in comparison to other voices during speech communication. The analysis of four formants F1 to F4 and fundamental frequency F0 in suspected and questioned filled pauses /ə:/ indicates their important similarity event speaking style in suspected and questioned voices was very different.

Further investigation will be interesting in intraspeaker and interspeaker variability in production a filled pauses /ə:/, as well as other types of pauses. Besides that, a special focus has to be made upon the integration of the psychological and instrumental-acoustic forensic observations.

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