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OBJECTIVE ASSESSMENT METHODS

Telemeeting assessment

Subjective method for simulated conversation tests addressing speech and audio-visual call quality

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Recommendation ITU-T P.1302 (ex. P.ACQ)

Subjective method for simulated conversation tests addressing speech and audio-visual call quality

Summary

This recommendation describes a subjective method for assessing the quality of simulated speech or audio-visual telephony calls with time-varying transmission conditions. Simulated calls consist of several stretches of speech or audio-visual material which are ordered in a logical sequence, according to a storyline defined by a scenario. After each stretch, test participants have to answer a content-related question, and they have to rate the overall quality of the call at the end of the entire sequence. The method is meant as a complement to standard listening-only or conversational tests, provoking a fixed structure in the material to be judged, while maintain a more-or-less conversational attention focus of the test participants.

Keywords

Call quality, conversation quality, speech quality, audio-visual quality, subjective methodology

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Recommendation ITU-T P.1302 (ex. P.ACQ)

Subjective method for simulated conversation tests addressing speech and audio-visual call quality

1 Scope

In this Recommendation, a subjective test procedure is described which is able to assess the quality of speech or audio-visual telephone calls, the so-called “call quality”. In contrast to standard listening-only tests as described in [P.800], call quality refers to the experience of a user during a typically 1-2 min long call. Such experiences are commonly addressed in conversation tests as described in [P.800] and [P.805], however real conversation tests commonly lack analytical power, because naïve test participants have to concentrate mainly on the flow of the conversation, and are unable to rate instances of good or bad quality. In turn, methods for the continuous assessment of quality as described in [P.880] do not put the listener in a situation which is comparable to a conversation.

In order to circumvent this problem, ETSI has developed a method for so-called “simulated conversation tests” in its TR 102 506 (2011), which has been adopted here and extended to audio-visual telephony. Simulated conversations consist of a number of short (8...12 s) stretches of speech, typically five, which are presented to the listening or listening-and-viewing test participants, and which follow a logical storyline. After each stretch of speech, the test participant has to answer a short content-related question, e.g. in terms of an answer to a multiple-choice question. Following the answer, the next stretch of speech or audio-visual material is presented, followed by the next question, and so forth until the end of the logical sequence is reached. Upon the end of the sequence, the test participant has to judge the perceived quality of the entire call on a standard (typically 5-point ACR according to [P.800] and [P.911]) quality scale. Those multiple-choice questions may refer to information transmitted via the audio, video or audio-visual modality.

Quality of short segments can either be predicted with subjective methods, e.g. [P.911] for audiovisual segments or [P.800] for speech segments, or can be assessed with instrumental models like [P.863] or [J.341], in order to analyse the relationship between the quality of individual samples and the quality of the entire call as assessed with P.ACQ.

The method is not intended to replace listening-only tests according to [P.800] or listening-and-viewing tests according to [P.911], or speech conversation tests according to [P.800] or audio-visual conversation tests according to [P.920]. Rather, it is recommended to make use of the appropriate method as follows:

- In case that the listening-only or listening-and-viewing quality is of interest and that the quality is considered to be constant throughout the duration of a speech-only or audio-visual

call, the method according to [P.800] or [P.911] should be used. [P.800] is, however, not recommended for longer durations.¹

- In case that the listening-and-viewing quality is of interest and that the quality is considered not to be constant throughout the duration of a speech-only or audio-visual call, the present method should be used; in contrast to the task of rating overall quality in [P.880] it addresses also audio-visual material and aims at establishing a more valid situation by introducing active participation of the participants
- In case that conversational quality which may be impacted by conversation-specific degradations like echo or delay is of interest, the method according to [P.800], [P.805] or [P.920] should be used

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T P.800] Recommendation ITU-T P.800 (1996), *Methods for subjective determination of transmission quality*

[ITU-T P.805] Recommendation ITU-T P.805 (2007), *Subjective evaluation of conversational quality*

[ITU-T P.863] Recommendation ITU-T P.863 (2011), *Perceptual objective listening quality assessment*

[ITU-T P.880] Recommendation ITU-T P.880 (2004), *Continuous evaluation of time-varying speech quality*

[ITU-T P.911] Recommendation ITU-T P.911 (1998), *Subjective audiovisual quality assessment methods for multimedia applications*

[ITU-T P.920] Recommendation ITU-T P.920 (2000), *Interactive test methods for audiovisual communications*

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 Conversational quality [P.10]: Quality with which a bi- or multidirectional conversation is perceived by a communication partner.

¹ A validation within ITU-T SG12 has revealed no significant differences between the results of a [P.911] test and a test according to the present simulated conversation test method results, for a limited number of constant audio, video or audio-visual quality degradations.

3.1.2 Conversational speech quality [P.10]: Speech quality as experienced in a bi- or multidirectional conversation.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 Call quality: Listening quality as perceived by a user at the end of a conversational call.

4 Abbreviations and acronyms

None.

5 Conventions

None.

6 Subjective test methodology

The characteristics of this methodology are as follows:

- By orally answering the questions related to each stretch of speech, test participants should be made to be involved in a conversation; nevertheless, the situation is a pure listening or listening-and viewing one, allowing the test participants to concentrate more on the form of the media than it would be possible in a real conversation
- The conversation is highly structured; in fact, it consists of short samples as they are used in standard listening-only or watching and listening-only tests according to [P.800] and [P.911]

Details of the methodology are described in the following paragraphs; the method is thus particularly tailored to situations where the quality varies over the time of a call.

6.1 Simulated conversation test addressing speech quality

A typical telephony situation is a dialogue between two persons in which both interlocutors have a certain amount of speaking and listening activity. Thus, the test situation is divided into parts with listening-only activity and parts with speaking activity. It is supposed that both participants in a conversation are interested in the conversation topic; in the test, this is realized by the test participant being asked for certain aspects of the content, thus to direct the focus of attention to the content of the presented speech stimuli, as it would be in a natural conversation situation.

In order to ensure the ecological validity of the test, typical contents of telephone conversations are chosen (e.g. request for a rental car, discussing the furniture in a room). The realization of such a simulated conversation consists of a series of shorter "utterances", which have a pause between them for interaction but are connected logically with regard to the content of the presentation. Instead of the own speech activity as a reply, an artificial content-directed task is to be done by the test participants. For example, test participants have to answer a question related to the content of the past stimulus, which can be done by keyword spotting

The speech samples used for the test should address topics like in a natural telephone situation. A simulated conversation consists of 5 samples of approximately 8...12 seconds and is constructed in such a way that 4 breaks are possible. After the fifth test stimulus, the participant is asked for an assessment for the overall call quality of the simulated call, instead of the content-related question. The questions asked to the participants after each sample of the simulated conversations and the corresponding answer options are presented on paper or on a computer screen after each sample. For each sample, a set of different questions is recommended in order to prevent test participants from memorizing the answers. The position of the right answer should also be randomly changed in

order to avoid participants answering mechanically. The number of multiple choice answer options may vary between 3 and 5. Simulated calls should be constructed for at least four speakers balanced in gender and comprising different scene backgrounds and conversation topics.

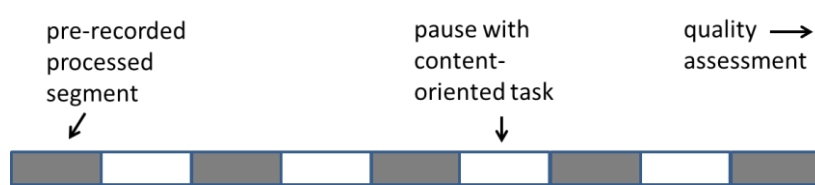


Figure 1: Schematic representation of the simulated conversation structure.

Figure 1 shows an exemplary structure of such a simulated conversation, using samples of 12 second length. The used speech material consists of 5 speech parts (samples), which correspond to the utterances of one party. After a 12 seconds speech sample there is a 12 seconds pause during which the test person had to perform a content regarding task. At the end of the sequence a score for the Call Quality is solicited from the test participants using an absolute category rating scale as described in [P.800]. Thus, the overall length of the simulated conversation is approx. 120 seconds, including the answering and quality-rating phases.

6.2 Simulated conversation tests addressing audio-visual quality

Similar to the methodology for speech-only call quality, a simulated videotelephony conversation is constructed as a set of five consecutive samples of short video clips. The samples are linked by the storyline. Participants are asked to watch each clip and then to verbally answer a question about the audiovisual content of the clip. The question could be related to the auditory content only, to the video content only, or to the audiovisual one, that is to say, a question that could be answered by using clues from both visual and auditory channels. The questions asked to the participants after each sample of the simulated conversations and the corresponding answer options are presented on a computer screen after each sample. The number of multiple choice answer options may vary between 3 and 5. For each sample, a set of different questions is recommended in order to prevent test participants from memorizing the answers. The position of the right answer should also be randomly changed in order to avoid participants answering mechanically.

Audiovisual clips should be composed of at least four speakers balanced in gender, comprising different scene backgrounds and conversation topics. The clips should involve the video channel by the means of visual cues (i.e. showing objects to the camera, pointing dates on a wall calendar, body gestures), so that the test participants have to pay attention to the video channel. The video clips and the time period allowed to answer each question should have approximately the same length, leading to a total duration of 10 times the stimulus length or 8...12 seconds. At the end of each simulated conversation, test participants have to rate the audiovisual quality of the entire dialog using a standard overall quality scale, as recommended in [P.911].

6.3 Features of the text material

When creating text material for recording the short stimuli, a whole scenario should be decided upon first, so each stimulus (utterance) represents an authentic sequel of the previous stimuli. Validated so far have been scenarios using a narrative form, i.e. without implying interlocutor's verbal action. In that way, listeners/raters are not confused when just answering questions instead of reacting on the stimuli, and two short utterances can be combined to one longer stimulus, if desired.

Also, each utterance should provide more than one important piece of information. That allows for more questions, but also prohibits a too easy listening task.

For the audio-visual tests, information should be spread on the two modalities, and accordingly, questions should be drafted explicitly addressing either audio or video transmitted information. See Appendices I and II for examples.

6.4 Pre-processing of the short segments

The original samples should be processed to obtain transmission quality as needed. As this method aims at time-varying transmission characteristics, changes in transmission characteristics can be induced between or within the short segments. Example profiles already used are illustrated in Appendix III.

6.5 Questions and Post-screening of participants

During the development of this method, the participant's answers have been recorded. But it has been shown that noting errors during a session was easily manageable by the instructor to automatically calculate the error rates. The purpose of this post-evaluation screening is to find possible outliers, i.e. participants who obviously did not concentrate sufficiently on the content or all modalities provided in order to give valid ratings of call quality. As with strongly degraded transmission, errors may occur independent of concentration, we suggest to define the exclusion criterion depending on the performance of subjects throughout the test. The alternative answers should be displayed on a screen without alpha-numerical labels to prevent participants just referring to these labels, but uttering (at least parts of) the answer.

Furthermore, while questions concerning audio, video or audio-visual content can be used, without observing major difference in the perceived quality of the samples, a combination of audio and video content questions is preferred in order to prevent priming towards one modality.

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Appendix I

Exemplary scenarios for simulated conversations addressing speech quality and audio-visual quality

(This appendix does not form an integral part of this Recommendation.)

All scenarios are designed to combine sentences (e.g. two) to one single stimulus.

Scenario 1: Scheduling medical treatment

1. Hello, this is Markus Lehmann. I would like to make an appointment concerning the treatment of my back complaint as discussed. [point on you back]
2. We had agreed on six weeks with two radiation sessions each. I would like to start the treatment now. [go to the wall calendar]
3. In the morning I am always busy. But on Tuesdays and on Thursdays would be fine. [point on Tuesday and Thursday on the calendar]
4. There is no way to come on Wednesdays, as I attend a language course at these days. I would like best to have regular appointments. [point to a huge blocker on Wednesday]
5. Besides, do you think that additional gymnastic exercises could decrease my afflictions in the long run? [do some exercises]
6. I was thinking about an introduction under the tutelage of a physiotherapist. Maybe, that could be a good complement to the radiation. [do some more exercises]
7. I hope the treatment costs will be fully paid by the health insurance. For this treatment, however, I do not know for certain.
8. Yesterday, I read in a newspaper once more about the approval of new austerity plan, mainly concerning the amount of assumption of costs. [show a newspaper]
9. Additionally, I would like to make an appointment with your partner in the group practice, the dentist Dr Kollwitz.
10. The date can even be next month. I would actually prefer it next month, as I am very busy this one. [point on the end of the month on a calendar]

(German)

1. Guten Tag, hier ist Marcus Lehmann. Ich hätte gerne einen Termin bei Ihnen wegen der besprochenen Behandlung meiner Rückenbeschwerden. [Zeigt auf seinen Rücken]
2. Wir hatten abgestimmt, dass ich sechs Wochen lang je zwei Bestrahlungen bekommen soll. Ich würde die Behandlung nun gerne beginnen. [Geht zum Wandkalender]
3. Auf keinen Fall kann ich vormittags. Dienstags und donnerstags wäre es mir sehr recht. [zeigt am Wandkalender auf Dienstag und Donnerstag]
4. Mittwoch ist bei mir unmöglich, da ich an diesem Tag einen Sprachkurs besuche. Am liebsten wären mir regelmäßige Termine. [Zeigt am Wandkalender auf Mittwoch, wo ein großer Blocker steht]
5. Außerdem möchte ich Ihre Meinung dazu hören, ob zusätzliche Gymnastik meine Beschwerden vielleicht langfristig verringern könnte. [Macht etwas Gymnastik in die Kamera]
6. Ich denke an eine Einführung unter Anleitung einer Krankengymnastin. Vielleicht ist das eine gute Ergänzung zu den Bestrahlungen. [Macht weiterhin Gymnastik]
7. Ich hoffe, die Kosten der Behandlung werden komplett von der Krankenkasse übernommen. Allerdings weiß ich nicht, ob es auch meine Behandlung betrifft.
8. Gestern habe ich wieder in der Zeitung gelesen, dass neue Sparpläne verabschiedet worden sind, die hauptsächlich die Höhe der Eigenbeteiligung betreffen. [Hält eine Zeitung in die Kamera]
9. Zusätzlich möchte ich noch einen Gesprächstermin mit Ihrer Praxispartnerin, der Zahnärztin Dr. Kollwitz, vereinbaren.
10. Der Termin kann ruhig erst im nächsten Monat liegen. Das ist mir sogar lieber, da ich diesen Monat sehr beschäftigt bin. [Zeigt am Wandkalender das Ende des Monats]

Scenario 2: Car Rental

1. Hello, this is Maria Eibig and I would like to rent a car. [grab a catalogue and show it]
2. A bigger estate car would be sufficient. But if a van is cheaper I would also take one of those.
3. I would prefer midweek, that is Wednesday. At that day I would need the car close to half past 8 pm. [show a picture with an estate car]
4. But if you offer a special rate for the weekend, I would do my transport then. [point to a wall calendar behind you]
5. For me it is important to take out an assurance for the car. I would also take the small trolley as per your offer. [point at the weekend on the calendar]
6. Additionally, I would like to have a mileage allowance for more than 500 kilometres and blankets as packaging material.
7. I would like to pay with my credit card. My customer number is 24 12. [show your credit card]
8. Last time I rent a Golf. That was beginning of last month. [point at the begin of the month on the calendar]
9. That time I returned the car fully fuelled. This time I will not manage to do so, as I will come back not until the evening. [shake your head]
10. I will then bring the car directly to your car park and return the following morning to do the billing. [point on a certain position on a map]

(German)

1. Guten Tag, hier ist Maria Eibig und ich möchte bei Ihnen gern einen Wagen reservieren. [Hole die Broschüre eines Autoverleihers heraus und halte sie in die Kamera]
2. Ein größerer Kombi reicht mir dafür aus, wenn ein Kleintransporter preiswerter ist, würde ich auch diesen nehmen. [Zeige ein Bild mit einem Kombi]
3. Mir wäre Mitte der Woche, also Mittwoch, am liebsten. Da würde ich den Wagen gegen zwanzig Uhr dreißig benötigen. [Zeige dabei auf einen Wandkalender hinter Dir]
4. Wenn sie einen Spezialtarif am Wochenende anbieten, würde ich den Transport auch am Wochenende machen. [Zeige am Wandkalender auf das Wochenende]
5. Wichtig ist mir noch der Abschluss einer Versicherung für das Fahrzeug. Den kleinen Rollwagen aus Ihrem Programm nehme ich ebenfalls mit.
6. Außerdem brauche ich eine Kilometerpauschale von über 500 Kilometern und Decken als Verpackungsmaterial.
7. Ich habe eine Kreditkarte mit der ich den Wagen bezahlen möchte. Meine Kundennummer ist 24 12. [Zeige die Kreditkarte in die Kamera]
8. Zuletzt hatte ich mir einen Golf geliehen. Das war am Anfang des letzten Monats. [Zeige im Kalender auf den Monatsbeginn]
9. Das letzte Mal hatte ich den Wagen vollgetankt zurückgegeben. Diesmal werde ich das wohl nicht schaffen, da ich erst abends zurückkomme. [Kopf schütteln]
10. Ich fahre den Wagen dann gleich auf Ihren Firmenparkplatz und komme dann am darauffolgenden Morgen zu Ihnen zur Abrechnung. [Zeige auf einen Punkt auf einer Karte]

Scenario 3: Kitchen Purchase Order

1. Hello. I would like to order a built in kitchen. Would it be possible to talk to Mrs Müller? [show a catalogue]

2. She consulted me in your salesrooms and we loosely agreed upon calling her until Wednesday.
3. I decided on the version in light grey. Giving a thought to it, a white kitchen appeared to be too cold to me. [Show a picture of a light grey kitchen]
4. Furthermore, I would like to have the doorknobs with the lozenge shape, as the round shape is a little bit too small in my opinion. [show a detailed picture of the doorknob]
5. Concerning the sink I consider taking a single unit. Thereby there is still space for a dishwasher. [show a picture of a sink]
6. I decided on the small dishwasher from the brand "Futura". Do you have one of these on offer? [show a picture of a small washer]
7. I suppose this washer provides aqua-stop. If not, I would rather take the next bigger model. [point to a "Aqua-Stop" label; alternatively change to "energy label"]
8. I am not decided yet on the cooker. I would like best to have one with glass-ceramic top and sensor circuitry. [point to top in the catalogue]
9. I am fine with the table. I would like to have one in the size of 100x160 cm. [show roughly the size with your hands in the air]
10. If I understood the catalogue correctly, it can be extended to the length of 200 cm. [show the extended size]

(German)

1. Hallo, ich möchte bei Ihnen gerne eine Einbauküche bestellen. Ist es möglich, dass ich mit Frau Müller spreche? [Zeigt eine Küchenbroschüre in die Kamera]
2. Sie hat mich in Ihren Verkaufsräumen beraten und ich hatte grob mit Ihr abgesprochen, dass ich mich bis Mittwoch bei Ihr melden werde.
3. Ich habe mich für die Variante in Hellgrau entschieden. Eine weiße Küche kam mir bei längerer Überlegung doch zu kalt vor. [Zeigt das Bild einer hellgrauen Küche in die Kamera]
4. Außerdem möchte ich alle Türknäufe in Rautenform, die Runden sind mir doch ein wenig zu klein. [Zeigt das Detailbild von Türknäufen]
5. Für die Spüle habe ich mir überlegt, doch nur ein Becken zu nehmen. Dadurch bleibt Platz für eine Spülmaschine. [Zeigt das Bild eines Spülbeckens]
6. Ich habe mich für die schmale Maschine der Firma Futura entschieden. Haben Sie so ein Gerät im Angebot? [Zeige eine schmale Maschine im Katalog]
7. Ich nehme an, dass diese Maschine über einen Aqua-Stop verfügt. Falls nicht möchte ich lieber das nächst größere Modell. [Zeige Aqua-Stop Label im Katalog; alternativ ändern in Energiesparlabel]
8. Bei dem Herd bin ich mir noch nicht sicher. Am liebsten hätte ich ein Gerät mit Glaskeramik Kochfeldern und Sensorschaltung. [zeige Kochfeld im Katalog]
9. Der Tisch gefällt mir gut. Ich hätte ihn gerne in der Größe 100 x 100 cm. [Zeigt die gewünschte Größe in der Luft]
10. Wenn ich den Prospekt richtig verstehe lässt er sich auf eine Länge von 150 cm vergrößern. [Zeigt eine Vergrößerung in die Luft]

Alternative Scenario 4: Birthday Party

1. Hi Jan. Last Saturday I went to Peter's birthday party. That war really great! [please wave and make an inviting facial expression]
2. There I met an old acquaintance. Here is a photo of our old friends with me. This is Stefan, Linda, and Markus. [show the photo and point to Stefan, Linda, and Markus each at a time]
3. After dinner a band arrived at the party and played music. I believe the guests really enjoyed it. Spirits were running high. Here is a shot. [show photo of people dancing in front of a band]
4. Do you remember Julia from our time at school? The two of us danced in the garden and she even taught me a break-dance move. Have a look. [show a photo of Julia and do a dance move]
5. At midnight we all gathered around a big cake to sing "happy birthday". The cake was made by Peter's mother. It was marvellous.
6. Before having the cake Peter received his presents. He got a drum set jointly from his parents and friends. Here is a photo. [show a picture from a drum set]
7. I talked with some of our old friends about the good old days at school and told each other funny story from back then. We laughed quite a bit. [smile and laugh]
8. When Peter's brother had to go to sleep, we sang a children's song, so he could fall asleep. [sing a children's song]
9. Then, Peter's parents told me details about their journey to Asia. They also told me how to use eating sticks. Like this. [Show using eating sticks]
10. I would like to meet you this week eventually and talk a while. I wish you well. Goodbye. [wave goodbye and smile]

(German)

1. Hallo Jan! Ich war letzten Samstag auf der Geburtstagsparty von Peter. Da war es wirklich super! [bitte winke und mache ein einladendes Gesicht]
2. Ich habe dort viele alte Bekannte getroffen. Da ist ein Foto von mir und unseren alten Freunden. Da ist Stefan, Linda und Markus. [zeige das Foto und zeige jeweils auf Stefan, Linda und Markus]
3. Nach dem Essen kam noch eine Band auf die Party und hat Musik gemacht. Ich glaube, die Gäste fanden das richtig gut. Die Stimmung war ziemlich ausgelassen. Da ist ein Foto. [zeige ein Bild auf dem viele Leute vor einer Band tanzen]
4. Erinnerst Du Dich noch an Julia aus der Schulzeit? Wie haben zusammen im Garten getanzt und sie hat mir sogar ein Break-Dance Move gezeigt. Schau mal! [zeige das Bild von Julia und mache eine Tanzbewegung]
5. Um Mitternacht haben wir uns dann alle um einen großen Kuchen versammelt, um Happy-Birthday zu singen. Den Kuchen hat Peters Mutter gemacht, der war fantastisch. [zeige ein Bild vom Kuchen.]
6. Vor dem Kuchenessen haben wir dann alle Peter seine Geschenke gegeben. Er hat ein Drumset gemeinsam von seinen Eltern und seinen Freunden bekommen. Hier ist das Foto. [zeige ein Bild vom Schlagzeug]
7. Einige alte Freunde und ich haben uns über die gute alte Zeit an der Schule gesprochen und uns lustige Geschichten von damals erzählt. Wir haben ziemlich viel gelacht. [Lächeln und lachen]
8. Als Peters Bruder ins Bett musste, haben wir ein Kinderlied gesungen, damit er einschläft. [singe ein Kinderlied]
9. Peters Eltern haben mir noch Genaueres von ihrer Reise nach Asien erzählt und mir gezeigt, wie man mit Stäbchen isst! So ungefähr. [zeige die Stäbchen]
10. Ich hoffe, wir können uns noch in dieser Woche mal treffen und etwas länger reden. Mach es gut, Tschüss! [winke zum Abschied und zeige ein natürliches Lächeln]

Appendix II

Exemplary questions and answers to the scenarios from Appendix I

(This appendix does not form an integral part of this Recommendation.)

Questions are separated in those concerning information from the audio (A), video (V) or both channels (AV). These should be mixed for the AV condition. The order of the answers should be randomized. Correct answers are bold. Subject making errors frequently should be excluded from analysis. Gender of the speaker has to be adjusted. If two subsequent sentences are presented a one stimulus, the short answers can be extended up to whole sentences.

Scenario 1: Scheduling medical treatment

1A Why does the patient calls?

- a. he wants to speak to an employee
- b. he misdialled
- c. he want to get an appointment for a treatment**
- d. he needs a prescription
- e. he wants a vaccination

1AV What medical condition does he have?

- a. toothache
- b. backache**
- c. twisted ankle
- d. he complaints about the treatment
- e. gnawing headache

1V Which body part does the patient show?

- a. back**
- b. shoulder
- c. wrist
- d. elbow
- e. neck

2A What does the patient want to do about treatment?

- a. start it**
- b. pay for it
- c. stop it
- d. interrupt it
- e. change it

2A How long should the treatment be?

- a. 1 week
- b. 1 year
- c. 6 weeks**
- d. 2 weeks
- e. 5 days

2A What kind of treatment is she supposed to get?

- a. pills
- b. radiation**
- c. infusions

2V Which date is shown on the calendar? (correct answer depends of material preparation)

- a. Monday, 15th
- b. Tuesday, 16th
- c. Wednesday, 17th
- d. Thursday, 18th
- e. Friday, 19th

3AV Which days does the patient prefer?

- a. Wednesdays only
- b. work days
- c. Tuesdays and Thursdays**
- d. 13th and 14th of February
- e. weekends

3A When can he not manage to come?

- a. weekends
- b. antemeridian**
- c. next week
- d. on foul weather
- e. in the evening

3V Which days are already marked in the calendar?

- a. Monday and Tuesday
- b. Tuesday and Thursday
- c. Thursday and Saturday
- d. Wednesday**