

**The
Stuttering Measurement System (SMS)
Training Manual
(Student's Manual)**

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INTRODUCTION

The goal of the activities you are about to engage in is that, while listening to the speech of a person who stutters, you will be able to assess concurrently that person's speech rate, stuttering frequency, and speech naturalness. It is hoped that in the course of these activities you will acquire an appreciation of the value of these measures so that you will use them during your regular clinical activities with stuttering clients and/or in your research, whenever reliable and valid measures of speech behavior are required.

These three measures - speech rate, stuttering frequency, and speech naturalness - are well established in the literature and have stood the test of time as sensitive measures for describing important speaking behaviors of people who stutter, especially as those behaviors change over time or under different speaking conditions (Ingham, 1984). Although there may be additional aspects of a stuttering person's behavior in which you are interested, these three measures should be part of any data pool collected for a given client or research participant, when the goal is to describe relevant and fundamental aspects of the person's speech behavior (R. Ingham & Costello, 1986; J. Ingham & Riley, 1999).

This program contains 63¹ speech samples, one, two, and three minutes in length. Some of the samples contain the speech of nonstuttering speakers, but most are from a diverse clinical population of persons who stutter. The speakers vary in age from 7 to 35 and are both male and female. The severity of stuttering ranges from very mild to very severe. Some people who stutter were recorded before they had received treatment, while others were recorded during the course of treatment. For some speakers, Standard American English was not their first language. Each person was videotaped while speaking in monologue in response to "topic cards" and, occasionally, in response to the camera operator.

In terms of the measurement of *speech rate* and *stuttering frequency*, the basic requirements are: a method of rapidly noting the occurrence of each syllable as it's being spoken, and whether it is stuttered; a convenient way to note and sum the total number of syllables spoken and the total amount of speaking time; and a method for calculation of speaking rate in syllables spoken per minute and stuttering frequency in percentage of syllables spoken that are stuttered. In terms of the measurement of *speech naturalness*, the basic requirements are: an empirical method of periodically rating and recording the naturalness of a segment of speech, and a convenient way to average these ratings for an entire speech sample. We use a 1-9 rating scale, where 1 equals speech that has been judged highly natural, and 9 equals highly unnatural sounding speech (Martin, Haroldson & Triden, 1984).

The system that you're going to learn here accomplishes these requirements. It is the computer-aided counting and calculating software system known as the Stuttering Measurement System, or SMS (Ingham, Bakker, Moglia, & Kilgo, 1999). Now I'll give a brief demonstration of how this system works, and then you'll be ready to start your training.

On the computer screen before you is the SMS data acquisition screen. Assume you are listening to a speech sample spoken by a person who stutters and concurrently operating the SMS.

¹ The accompanying videotape says 72 samples, which is incorrect. Sorry!

- First, depression of the left mouse button signals to the computer that one syllable has been spoken, so one syllable is counted. This is shown in real time on the computer screen in the SYLLABLE box, where the number of syllables counted is shown cumulatively.
 - If you are using a laptop computer without an external mouse, press the corresponding button to record syllables.
- Depression of the right mouse button indicates that a moment of stuttering has been judged to occur. This is shown in real time on the computer screen in the STUTTER box, where the number of stutters judged to occur is shown cumulatively. When one occasion of stuttering is counted, one syllable is added to the syllable count as well.
 - Again, for laptop computers without an external mouse, press the corresponding button to record stutters.
- In addition, periodically a tone sounds and a 5-second visual signal appears at the bottom left of the computer screen, signaling the listener to make a naturalness rating for the preceding interval of speech. This is accomplished by pressing a number from 1 to 9 on the computer keyboard, where 1 equals speech that has been judged highly natural, and 9 equals highly unnatural sounding speech.
- The clock at the top left of the screen displays cumulatively the length of time during which data are being collected, and it stops automatically at a preset duration, for example, at the end of 2 minutes.

When data collection for a given speech sample is completed, the computer screen displays the total number of syllables and stutters that were counted. In addition, the computer calculates and displays, for the entire sample, the client's speaking rate in syllables spoken per minute (SPM), the percentage of syllables spoken that was stuttered (%SS), and the average naturalness rating.

In the next paragraph of your manual is this transcript of a 20-second segment of speech from a 4-year-old boy who stutters. Each syllable spoken is indicated by a dot above the vowel of the syllable. Each moment of stuttering is underlined. The location and duration of the naturalness rating signal, set to end at 20 seconds, is indicated within brackets. Now I'll demonstrate how the SMS is used for online recording of syllables, stutters, and naturalness while that sample is played. This will give you a picture of the way the system works and of the tasks you'll be learning.

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 I can rename how small I was. Well III was probably about a little zero and, and no,

pro-probably whe-when I was in my mom's stomach [I wa- I was a-a fingerail.]

These data indicate that this boy uttered 39 syllables in this 20-second sample. In addition, six of those syllables were stuttered. Therefore, the speaking rate was 117 syllables per minute with approximately 15% percent syllables stuttered. Naturalness for the entire sample was judged to be 5 on the 9-point scale. These are the kinds of data that you will be collecting by the time you have completed this program.

Now I think you're ready to start learning how to use the SMS. Therefore, let's set up the system for the first step in your training program. The SMS system offers many options to the user in terms of the kinds of analyses that can be made from these fundamental data collection procedures. These are described in detail in the appendix of your manual. However, here we'll just talk about the settings that are needed for you to begin.

- Start by bringing up the SMS program on your computer screen. I have mine set up with an icon on the desktop screen. (Be sure to note the names of the clever people who devised this system!)

- On the top row you will see several labels. Click “ADD SUBJECT”; type in 1 as the First Name and sample as the Last Name (for Sample 1); click on “Add” and then “Close.” Now you have added a file that will store the data for this sample.²
- Next, click on “SELECT SUBJECT.” Look for “Sample 1 SMS”, the sample label you just added, and highlight it by just clicking on it. Then click “OK.” Now you have opened the file in which you want to store the data.
- Next, click on the SMS label in the top row. Notice that a warning appears reminding you that no other programs should be operating while you are using the SMS. After all other applications are closed, click “OK”, which will advance you to the next screen of the SMS called the “SMS Run Configuration” screen. (The other labels on the top row are described in appendix.) Let’s run through the SMS settings that are relevant for your first task.
- Run Length. The SMS Run Configuration screen allows you to select the parameters you would like to use for a given data collection occasion. A “run” refers to the duration (in seconds or syllables) for which you would like to record data. For now, set this parameter at 60 seconds by typing “60” in the box (or by clicking on the arrow and selecting 60).
- Display Timer. Click in the box so that a check mark appears, indicating that this feature is “on.” This will allow you to see the clock on the screen as data are collected.
- Run Summary Printout. Ignore this item for now. (Its function is described in the appendix.)
- Pause Control and Trigger Interval, will also be ignored for now, although these are important features for data collection during conversation samples, so check the appendix for their description.
- Standard Mousebutton Configuration. Click in the box so that a check mark appears. This establishes the left/top mouse button for counting syllables and the right/bottom mouse button for counting stutters. If you are left handed then you can reverse the mousebutton configuration, but be aware that all further descriptions for the mousebutton operations will be reversed.
- Start/Stop Tones. Click the box so that it produces a check mark. This item determines whether tone signals will be heard at the beginning and end of a run.
- Use Syllable Mode and Syllable Count Target. These will be ignored for now. You may review this important option in the appendix.
- Display Syllable Counts. Click in the box labeled “Continuously.” This will allow your ongoing syllable counts to be displayed on the screen.
- Display Stutter Event Counts. Click in the box labeled “Continuously” so that your ongoing stutter counts will also be displayed while you are counting.
- Display Stutter Interval Counts. Ignore this item and consult the appendix for its function.
- Display Naturalness Rating: Ignore this item for now. We’ll return to it in Part Four.
- Rate Naturalness and Rating Period and Tone Prompt. Ignore for now. These features will also be described in Part Four.
- Periodic Display Parameters, Update Period and Display Duration. Ignore these features because we have already chosen to display our data continuously.
- Use Intervals and Interval Length. Ignore this item, but read about its function in the appendix.

When all of the parameters have been set to your liking, click “OK.” This advances you to the data collection screen, which you will see as you collect data. At the top left of the screen is the clock, showing :00. At the top right is Sample 1, SMS (the sample name) and the RUN number, which for the time being is number 1. Each time you start another under the same file name, the run number will advance. You can also see that the display is set so that you will continuously see the number of

² In the future, when you want to return to this file, all you have to do is click “Select Subject” from the top row, find Sample, 1 in the list of files that have been stored, click on it to select it, and then click on “OK.” That way, all data collected under this label will be kept in the same file for easy retrieval.

syllables and stutters that you are counting. Leave your computer with this screen showing while you read the instructions that follow. You will come back to it shortly.

Now you are ready to begin Part One, Counting Syllables. For the remainder of the program all of the instructions you will need are contained in the manual. We hope you enjoy learning to use the SMS and that you acquire an appreciation for the information it provides regarding important speech characteristics of people who stutter. Now, continue by reading about Part One. The manual will tell you when to return to your monitor screen.

PART ONE: COUNTING SYLLABLES

The general purpose of this section is for you to learn to count accurately the syllables produced by a speaker and to be able to do this "online", that is, while the speaker is talking. Part One is also designed to help you learn to recognize various speeds of speech. Speed of speech, also referred to as speech rate, is an important dimension of a speaker's speech pattern and one that changes as a function of treatment. While typical nonstuttering adults generally speak at speech rates between 170 and 220 syllables per minute (SPM), most stuttering speakers display overall speech rates that are slower than that (Bloodstein & Ratner, 2008). This is primarily because moments of stuttering take up time, thus allowing the production of fewer communicative syllables per unit of time and therefore the communication of less information in a given amount of time. On the other hand, while the speech rate of a person who stutters may seem to be slow, when stutter-free segments of that speech are measured - this has been referred to as articulatory rate by some writers (Perkins, 1975; Costello & Ingham, 1984), some are found to speak at exceedingly fast rates. Thus, a measure of speech rate is one important descriptor of a person's speech pattern. Pretreatment measures of speech rate will contribute to decisions regarding the kind of treatment that may be appropriate for a client. Some treatments rely on systematic, progressive changes in speech rate (Ryan, 1974; Ingham, 1984); therefore, ongoing speech rate measures can be important to the treatment process as well. Further, at the completion of treatment, measures of speech rate are necessary to determine that speech rate has become normalized.

The speech samples of Part One are taken from the speech of people who do not stutter. The speech samples vary in length, beginning with 1-minute samples and progressing to 2- and 3-minute samples. They also vary in speed, beginning with relatively slow rates and progressing to more rapid rates.

Following is a list of directions explaining how to get started. Read through the list before performing any of the operations. Then return to #1 and carry out the directions.

1. Place your computer in a comfortable place so that you can readily see the computer screen, use the mouse buttons, and view and control recordings. You have previously set the SMS program to record data from Sample, 1 with the screen showing the clock at :00 and both SYL and STUT counts at 000.
2. **Start the sample by left clicking the sample number.**
3. Before you begin counting syllables, listen to the first 30 seconds or so of the sample to "calibrate" your ear. After you have become familiar with the speaker's speech pattern, return to the beginning of the sample.
4. Now you are nearly ready to try your hand at counting the syllables produced by the first speaker. Your task is to count (i.e., depress the left mouse button for) every syllable that the speaker produces, including "um's" and "well's" and other insertions, as long as they are able to be spelled. Be sure to count what the talker actually says, without being influenced by how you might say the word or by how it is spelled.
5. Start the sample. When the sample speaker appears, immediately mouse click anywhere on the screen to start the SMS timer and begin counting syllables by depressing the syllable mouse button once for each syllable spoken. (For Part One talking samples you will ignore the right mouse button.) Sample 1 is one minute in duration and the SMS will automatically stop accepting syllable counts at the end of one minute (because you have set the run time for 60 seconds). Stop counting at the end of the sample or press the Escape key.

6. When 1 minute has elapsed, the SMS will automatically display the total syllable counts on the screen. You'll see a box that shows the number of syllables counted (SYL) and below it, the speech of speech in syllables per minute (SPM). This will also happen when you press the Escape key. Of course, when data are collected for precisely 60 seconds, those numbers will be the same. The boxes related to stutter counts will remain empty at this point.
7. Next, turn to the section of the manual that contains the summary data for Part One, which follows these instructions for Part One. There you will find a summary data sheet to be used for recording your data for the sample. On the section of the data sheet labeled Step 1, Sample 1, record the number of syllables you counted in the "1" column (first attempt). Then compare your number to the Target Range of acceptable counts shown on the data sheet for that sample. These numbers represent the range from 5% below to 5% above the exact number of syllables spoken in the sample. For most purposes, this level of accuracy is quite adequate and sensitive as a measure of a client's speed of speech.
8. If your count is not within the acceptable range:
 - Return to the sample and play/count it again.
 - On the SMS screen in the box labeled Continue, click on "Make another run with the same setting" and click "OK" (or, touch Enter). This will produce a new data collection screen for Sample 1, this one labeled Run 2.
 - Repeat the process described in items 5-7, except record the number of syllables you counted in the "2" column of the data sheet (second attempt). Once again compare your number to the acceptable range. If your count is still not in that range, repeat the entire process a third time and record your completed syllable count in the "3" column on the data sheet. Then again, compare your data with the Target Range.
 - If, after three attempts, your count is still not within the acceptable range, return to the beginning of the sample once again. Then, find the transcript of that sample in the manual. Transcripts of each sample can be found in numerical order on the pages immediately following each data summary sheet. This time, replay the sample and recount the syllables while reading along on the transcript, where every 50th syllable is marked. You may want to stop periodically to see that your count is closely matching that shown on the transcript or to try to figure out the source of differences between your count and the count on the transcript. Words that might be particularly susceptible to recording errors are noted on the transcript by dots above each syllable spoken, thus indicating the number of syllables counted for that speaker's rendition. Record your total syllable count in column "4" of the data sheet.
 - After you have worked through the transcript, replay the sample and recount the syllables, without benefit of the transcript. Record the data in column "5" of the data sheet beside the appropriate sample number. Your count should be within the acceptable range by now.
9. When your count is within the Target Range of acceptability, you are ready to go on to the next sample. Repeat the process of adding a new "subject", which will be Sample 2, as follows.
 - On the SMS screen in the box labeled Continue, click "Return to the Main Menu" and touch "OK."
 - In the row at the top of the screen click on "Add Subject."
 - Label this as 2 in place of a First Name, sample as the Last Name, click on "Add" and then on "Close."
 - From the top row, click on SMS; click "OK" indicating all other programs are turned off.
 - When the Run Configuration screen appears, check to see that all the settings are appropriate. They should be unchanged from the settings utilized for Sample 1.
 - Click "OK" and now you're ready to follow the procedure described above (items 2-9) for Sample 2.

- Continue counting syllables in this fashion through Steps 1, 2, and 3 (Samples 1 through 9). Then stop the program and read the following paragraph before you begin syllable counts for Steps 4 and 5.

Instructions Regarding Steps 4 and 5

The talking samples of Steps 4 and 5 are 2 and 3 minutes long, respectively, and are mixed across normal, normally fast, and fast speaking rates. The process for recording data for Step 4, Samples 10-12, is the same that you have followed previously (add New Subject, labeled 10, or 11, or 12, etc., *except* you will type in 120 seconds as the run time on the Run Configuration screen and click on "OK." All other parameters will remain the same. For Step 5, Samples 13-15, set the run time for 180 seconds.

As before, continue counting syllables until the speech sample is over. This time, when you record your count on the data sheet you will note that there are two kinds of data to report: total number of syllables spoken (top line), the data you have been recording thus far, plus speech rate -- in syllables per minute (SPM) (lower line). The computer calculates SPM by dividing the total number of syllables counted by the total amount of talking time in minutes (to 0.1 min.). Record both of these numbers from the data summary screen and compare your data to the acceptable Target Ranges shown on the summary data sheet. As previously, when your count is not within the Target Range, repeat the sample until it is. When it is within the Target Range, move ahead to the next sample. When you have completed all of Part One (through Sample 15), return to the manual for instructions regarding Part Two.

PART ONE: COUNTING SYLLABLES

DATA RECORDING SHEETS AND TRANSCRIPTS

Steps 1 – 5, Samples 1 – 15

Step 1: Slow-to-Normal Speech Rates

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 1						111-123 syllables/SPM
Sample 2						140-154 syllables/SPM
Sample 3						171-189 syllables/SPM

Step 2: Normal-to-Normally Fast Speech Rates

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 4						217-239 syllables/SPM
Sample 5						224-248 syllables/SPM
Sample 6						240-266 syllables/SPM

Step 3: Normally fast-to-Fast Speech Rates

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 7						251-277 syllables/SPM
Sample 8						285-315 syllables/SPM
Sample 9						308-340 syllables/SPM

Please return to the manual for special instructions regarding Steps 4 and 5.

Step 4: Normal-to-Fast Speech Rates

	1	2	3	4	5	Two-Minute Samples TARGET RANGE
Sample 10						408-452 syllables
						204-226 SPM
Sample 11						453-501 syllables
						227-251 SPM
Sample 12						490-542 syllables
						245-271 SPM

Step 5: Normal-to-Fast Speech Rates

	1	2	3	4	5	Three-Minute Samples TARGET RANGE
Sample 13						484-536 syllables
						161-179 SPM
Sample 14						774-856 syllables
						258-285 SPM
Sample 15						805-889 syllables
						268-296 SPM

Congratulations! You have completed Part One. Now, please turn to Part Two in the manual for instructions regarding Counting Stutters.

SAMPLE 1

Um...some of 'em, um the transformers, they transform into robots and
some fly and some don't. Well, (exhales) usually all of them fly. But some
don't and... I have gobots, too. Some are old; some are new. And...I got a
50
big big foot with two wheels. He can transform. And it's red and his head
can pop up and it go "uh" when you push a button. Two more buttons
100
don't do anything. It- he can go backwards and forwards and that way and that way
(prompt)
117
What? Um, one looks like an airplane and one when you pull him back...

SAMPLE 2

Small. He won't gra- he won't grow any bigger. The house? 'Kay. Well, I
tell you what I do in the house. Well now I have to clean the house. Today
50
I had to do the dishes and put my clothes away, in the proper place and and
I hadda feed my cat, too. And my mom said if I keep doing that , then I'll
get seventy-five cents a day. And I do it too because I want the money to
100
save it for church. Okay, I'll tell you about the house now. Well, my house
is in the middle. My Grandma lives in the back of the house. It was a
147
garage but then they made it to her house and it has, we have a little room...

SAMPLE 3

and then Babes in Toyland is a movie about these um this girl named Mary
an um this guy named Tom and this wicked person called Barnaby. And
50
Barnaby wants to marry Mary an' he hires these two bad guys to um take
Tom away an' throw 'im in the sea. But instead they take 'im an they put,
sell him to the gypsies an' the gypsies keep 'm. An' then um Barnaby gets
100
married and he doesn't marry her. But then he calls the a gypsies and the
gypsies bring Tom an' he's dressed up has a wig an an old lady suit an he he
150
jus like um surprises everbody an' then takes off with the wig an' shows
Mary. An' then she and then they go, they 'f' go. The children are in the
180
forest, the Forest of Never Return an then...

SAMPLE 4

people. Um those land owners find it uh profitable to grow crops, either
monocrops such as coffee or bananas etcetera to ship out or beef, in
50
particular. Uh beef is a good one, but if anybody does a little study on how
much it takes to to feed a cow and and know a little about uh energy uh
100
etcetera, I guess it takes uh ten bushels uh corn or or ten pounds uh corn to
get one pound of beef or something incredible like that. So, it's quite a
waste of uh resource. And uh if the lands of these third world countries
150
were instead planted with uh corn or whatever type of grain they eat and uh
fed, sold to their own people, uh more people of the world could be fed;
however, the landowners wouldn't make the money they do by shipping the
200
beef to the U.S. So, there's quite a problem there. Uh, if there wasn't the
228
demand, however, for the beef, then other things would be planted. Um...

SAMPLE 5

gauge so when your tank gets to a certain level of air it'll become very
difficult for you to breathe, so you pull a cord, I take it, and then it gives
50
you a few extra hundred pounds of air so that you know, "Well, my tank is
full and now it's time to go back up." Well, it had this tank with a J-valve,
and it also had an unbalanced regulator, which means the deeper you go the
100
harder it gets to breathe. So, after I got in the water I kept thinking, "Oh,
it's time to pull the J-valve. It's time to pull the J-valve." I hadn't even
150
been in the water for five minutes. And these German's had asked me if I
had ever dove before, and I said, "oh sure, I've been diving for years. And,
you know, I know what I'm doing." Well, I got in and my mask kept filling
200
with water and I had these cruddy fins and this just crazy gear, and I was
really uncomfortable. And I have a feeling they were looking at me
236
thinking, "Oh boy, she's never dove before." (laughs) And...

SAMPLE 6

if hobby or profession because he always has to have the latest instruments
or lenses or cameras. Um, film processing is always expensive or all the the
50
- he can develop his black and whites but he doesn't have the equipment to
develop color prints. um, so we're always spending money on camera
equipment. Of course I had t- when we got married his visa account
100
(laughs) was sky high full of camera stuff and so I kind of took that over
when when I married him (laugh). But he he says its all going to pay off so
(laughs). Um, he's really enjoyed living out here. He came out here just for
150
me to go to school. He didn't have a job when we came out, um I, you
know, had asked him, we both graduated from Nebraska in May and um I
200
knew we were - I was going away to grad school, and he said wherever I
wanted to go he'd follow. So, I thought that was really interesting because I
have a lot of friends who j-did just the opposite. You know, I- when I got
250 253
married - that was kind of funny this summer.

SAMPLE 7

The fall foliage colors that just erupted uh north of where I was at into
Connecticut. An hour drive and and you're in total wilderness in the
50
mountains uh not much further than that you could be uh upstate New York.
Uh, just go up the New York Turnpike and or in to New Jersey um there the
Adirondack uh down to the Jersey coast if you want to gamble or just go to
100
a nice beach with everybody else in New York and New Jersey on the
weekends at the beaches in New Jersey. Um, there was a lot of things to do
that just aren't available here. I think having done them all once will
150.
probably do it though. I'm not sure I want to run back. Uh, winter, the
winter I was there was the winter of the Olympics. The Winter Olympics
200
were in New York and there was no snow. They complained it was the
mildest winter in fifty years, and they had to truck snow in from Vermont or
somewhere for the ski runs during the Olympics. And, (laughs) I was about
250
to die it was so cold, myself. Uh, the few times it did snow, I was totally
264
incapacitated.

SAMPLE 8

and s' right at the end of the Salt Flat you get in to Salt Lake City. And th'
uh there's a big a big grade you have to drive up to get into Salt Lake City.
50
(sniffs) And it's it's a pretty mean grade and so Mom got into th-, she was
driving when we hit the grade and and we just didn't think anything of it 'n'
so we're driving up this grade getting to Salt Lake City and it was about
100
four o'clock at night so it wasn't too hot, and our camper had a hard time in
real hot weather, so it was it was a good time, and so we're driving up this
150
grade and all of a sudden the camper dies. It goes guh-guh-guh-guh and
died. So we're just like on the side of the road going up this grade with a
camper that won't run. And uh actually, we we got into one of the
200
viewpoints or something like that on the side of the road it was a rest area so
we weren't out in the middle of traffic (sniffs). And uh we just waited there
for awhile and thought that maybe that would that would take care of it and
250
it did. So we waited and it took care of the problem. So we finished the
grade and got into Salt Lake City and then went on a little farther and got
300
into Indiana and there's another grade and we go up the grade and...

SAMPLE 9

slow night, you know why might as well be slow, right? and so, um, she uh
gets my order. I pay nine fifty or whatever for a large pizza and uh my
50
friend and I go and sit down and uh we're waiting there and it's you know,
fifteen minutes, you know, and you figure fifteen minutes should be about it
for a pizza. Come to be half an hour now and no pizza yet, so I uh go over
100
to the counter and I ask, you know, "What's going on? How long is it
gonna take?" And and she uh she kind of walks over to the oven pulls it
open and she goes, "Oh, five or six more minutes," you know, and (sighs) I
150
uh look at her. I'm thinking, ya know, "what else are they doing here?" It's
not real busy, like I say. There's only three people there and they're already
200
eating their pizza. So, I go sit with my friend again. I keep looking over to
the, to the kitchen part and they're sitting there laughing and everything and
finally I see this shocked look on the girl's face, and she runs over to the
250 ..
oven and pulls out this pizza, and they start laughing and so I realize they
forgot our pizza. And so I go up there and I uh, I got it to go originally, and
300
that they put it on a pan and I uh well said, "This is to go." An' he kind of
324
puts it out in front of me, this kind of semi-recognizable pizza now...

SAMPLE 10

I'm from there. Real pretty and clean and nice place to be. Um, I'll tell you
- let me tell you about of few of my interests. I think that would be a little
50
more exciting than going through the lifeline of my life. Although of
course, that is very exciting (laughs). Um, probably one of my favorite
things to do is to travel, and I've been fortunate (laughs) in that I've gotten
opportunity to travel quite a bit. Um, I've been all throughout the United
100
States, and Europe. Um, I think probably one of my favorite places was
Switzerland. 'S real beautiful; I love the mountains. It's green and lots of
150
wonderful hikes and uh the people were really nice and friendly, although
they wouldn't allow me to speak German, no matter how hard I tried (laugh)
they would cut in English 'cause it was so blatanly obvious that I was
200
American, struggling. Um, and I think Canada is a real beautiful country as
well. Probably for a lot of the same reasons (laughs). Um, beautiful
250
mountains, beautiful hikes, lots of neat outdoor things to do. Um, (clears
throat) although I think other parts of Europe are extremely interesting,
France, um Italy, really all - England, all throughout Europe just because uh
300
it's fascinating to see all the history there that I don't think we get in
American really at all since our country is so young. And uh, it's um I
think, it's just, it's interesting just to see places that have existed there for
350
hundreds and hundreds of years. As you walk through a place, a castle or
something, and you think back that people hundreds, maybe even thousands

of years ago have walked through the same place that you're walking

400

through, now (laughs). You hope they're not still there in some form

following you around. Um, but I really enjoyed that and I really enjoyed

430

the art in Europe.

SAMPLE 11

The Oregon coast is quite beautiful. It's a lot different from the beach areas
around here. It's not exactly the kind of beach you go and lie out and try to
50 get a suntan, considering it's overcast about three hundred and fifty days
out of the year. But I really enjoyed my experience in Oregon, and it was
100 good for me because I think leaving home sort of having to rely on myself,
not necessarily monetarily, but at least um, I don't know, on an emotional
150 level, growing up. Uh, it was a very good experience and something that I
think a lot of people miss out on when they just go to school around home.
Granted there's a, an incentive to save money that way but, um I would
200 definitely recommend going away from home to school. Well. let's see.
I'm trying to think of other things to say, and I just thought of something.
Um (laughs). It's not all that interesting but it was a trip I took to
250 Wahington, D.C. when I was thirteen years old, the Bicentennial. I guess I
was fourteen, Oh well, that doesn't matter. Um, that was a, that was a lot
300 of fun. I really enjoyed that, and because I am very interested in history it
held a particular-particularly strong fascination for me. Um, I 'member it
was the first time I ever tasted liver, and that was at the Smithsonian
350 Institution; and therefore I don't have fond memories of the Smithsonian
because of it. Um, I remember that at, at one point we had watched the
Cherry Blossom Festival Parade, which to them is like our Rose Parade in
400 Pasadena on New Year's, and we had been watching that all day long, our

tour group, and we had a choice. We could either (A) go to the National
Gallery of Art or (B) go to McDonald's. Well, naturally everyone chose the
sensory stimulating McDonald's over the boring art museum except for me.

SAMPLE 12

I was coming up a high, a large grade, drafting behind some large trucks,
the um semi's, 'n' my little car was not quite making it up the hill, so I just
50
got in behind them and and was doing fine, and they were doing about
seventy miles an hour to get over this grade, and as they finally bogged
down close to the top, I pulled out and went on past them at the same speed.
100
Came across the crest of the grade and just out of view over the rise were
two um Pennsylvania troopers. One with a radar gun smiling at me and the
other one standing out on the road just kind of waved me down. He s'
150
pointed, said, "You, over there." And uh pulled off down the road and had
to explain first of all what I was doing with the car with New York tags and
200
registration, California license plate, and a Navy I.D., with leave papers
addressed to Los Angeles. Um they bought my story that uh had everything
they wanted to see, leave papers and all. Uh for a minute there I thought I
250
was going to enjoy the hospitality of um western Pennsylvania a little
longer. And they sent me on my way with a little mail coupon to send to
them for umm sixty-five dollars or something. A very forthright state; they
300
had signs on the freeway says, "If you speed, if you choose to speed, uh
every five miles an hour will cost you this much. And they had it broken
down real nicely so there was no debate. You just, they clocked you and
350
you paid them. And they assured me that if I sent them a money order
within a week, they wouldn't bother me ever again. So, I did that soon as I

400

got to a town that was open that day. Drove to Cincinnati , Ohio, from my friend's in Pennsylvania, which was quite a little bit of a drive. Visited a

friend there from the Navy. Um was only going to stay one evening, ended

450

up staying two and a half days because there were social plans made for me before I got there. Some dinners to go to and uh it was close to Christmas.

500

There was a company Christmas party, and I ended up having a real nice

516

time in Cincinnati. That was a beautiful city.

SAMPLE 13

It's it's hard to do but I don't know how to do gymnastics like like um well
some friends can at school. Well not at school but they like 'k play around
50
the bars, do all these weird things on the bars. 'N' I saw some people in,
you know, in oh like in Olympics, how you stand up straight on those rings.
I saw some guy doing that once in in his, I don't understand how he did
100
that. I tried that once- hard, no way would I be able to do that - that's too
hard for me. And just because I don't know how they do that just takes a lot
of training and I don't ha- I don't know how to do that training n' I don't
150
know any trainer to teach me how to do gymnastics. But, the people in the
'lympics li- make it seem so easy n' just like 'n' just go up to those bars and
200
do what they do but no way not for me and not for a lot of people because
it's hard. But if you learn if you learn then you be good and be in the
'lympics, then won't be hard for you, cuz then you learned and you know
250
how to do that gymnastics. (cough) Well, Nature, like, know, the animals
and things like that. I like animals, especially cats and dogs. They're one
of my favorite. They're one of my favorite pets. And and rabbits and birds
300
and fish. That's that's all my pets. Like, um, I have a dog that's named
Ewok, and 'n' 'ave a rabbit that's called Thumperella. Then we have this
we have this um we have cat, and some fish, and some birds. We have two
350
finches and a parakeet. And one of the finches 'n' I- one of the parakeet's
name is um, it's a weird name but it's Japanese. It's Aheecheeby. Mm but it

talks. Like if I'm gone, he'll go, "Where's Eric?" And he goes like um,
400
"Eric went to school" and things like that- 'n' (throat clearing) it's funny
because he, we teach him how to talk 'n' he talks. And like bears and things
like that, they scare me but but they're nice because they're ha- they're
furry and they're -- some are cute like little cubs, little babies, they're cute.
450
And deers, I like deers. And birds and all those things like that I like. And I
don't know why I like those but all those animals seem just friendly, s'
plain friendly. But like some people would just shoot 'em down and that
500 510
isn't nice because eh some are almost extinct.

SAMPLE 14

a public pool 'cause someone else takes care of them. But, when you have to take care of them yourself, they're not any fun and I think the best thing to do with our pool is to pour cement in it because (laughs) there- there's always a problem with it. Um, I have, let's see, I could talk about my bad luck with cars. Um since, I've been driving for quite a while, I'm twenty-two now. When I was sixteen I got a car, and since then, I think I'm on number five (laughs). My first car I got um, for about five hundred dollars. Lasted about two months. Just mechanically would have cost more to fix it than to buy a new car, so we went for a new car. Um, I drove that one, which turned out to be the best car I ever owned, until I went to college, and then my dad thought I didn't need it anymore, cuz since he bought it, it was his car. He sold it ra' than offering me, giving it to me to buy. So I had turn around a year later a buy a car on my own (laugh) um, which I had for about a year. And um, being from Nebraska we always have to turn our heaters on full blast in the middle of winter and I did that one day and the car just started on fire and there it went. And I got out in time to watch it burn away and there was nothing left of it except for the frame (laughs). So I went and bought a new car and I got a little Datsun which was a great car. I loved it. It was about three years old and only had eleven thousand miles on it and it was cute, 'N' when I went to find a car, I wanted a cute car and everybody kept saying "what is your definition of a cute car?" But I finally

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found one and had that about six months until some lady rear-ended me and pushed me into the back end of a truck. So, um, that one didn't last very

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long and there wasn't much left of it. So, then I bought a Monte Carlo and, which is a lot bigger than any other car I've driven, and I didn't want a big

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car except for I was getting married and my husband is very big. He's about six-five. And so, to be courteous to him, we didn't have a car at that time, I

bought a big car so that he could fit in it. Um, well, I bought this car from

550

somebody else and it had an engine problems and so I ended up having to

replace the whole engine, which cost quite a bit of money. So basically, I

600

was, a brand new car. Um, and after I did all that to it, my husband turned

around and bought a Datsun B-two-ten which is very small (laughs), and it's

even smaller than the Datsun I owned before. So, um, then we brought all

650

the the both the cars out here, the Monte Carlo and the Datsun B-two-ten

and little did we know um about the smog laws and everything and so we

had to have the cars checked. Well, neither one passed because when I put

700

my new engine in in Nebraska, they didn't put any of the pollution control

devices on it, and it's gonna cost about a thousand dollars to fix that. So, we

750

decided it wasn't worth fixing (laughs) so the car's just gonna stay parked

until we take it back to Nebraska. Um, my husband's car didn't pass either,

but that's not as major; they think it's just clogged and they have to clean it

800

out. But um then my husband kep saying, "Well, with your luck of cars

815

maybe someone will hit the Monte Carlo and ...

SAMPLE 15

school. I was an art major like I mentioned before and wanted to go into commercial art. Uh, I currently am working for the admissions office here, 50 uh, here at school and and that has really appealed to me a lot and so much so that um that's become a second possibility, or or er a strong contender . .100. for a career choice, um. I, I enjoy the work that we do. We basically go out and and uh, and inform students on the admissions requirements, on how to get into school, uh, counsel them about career planes, things like that; and 150 . . . that has really really been ah an enriching experience, um, to be able to, um help students is, is just really neat. The student contact is is a lot of fun. 200 You meet so many different people. I aum, I am sometimes called to to give a tour, too of the campus here and and just seeing the various backgrounds of people coming in from out of state, uh various parts of of uh of our own 250 state, and uh to be able to show them the campus, and and uh as well as learning of as far as where they're from is, is a neat experience. I've been involved in um in church here very strongly and so that's another reason to 300 stick around the area. Uh, helping with Sunday School has also been really neat. I'm, to be able tuh to uh, to teach the kids and stuff has been has been 350 another really enriching experience. So, uh, art has has slowly gone over to the side. I'm still involved in it. I uh still ah do as much as I can to keep, t' 400 keep from getting rusty. Uh, I I would get a a job um offer every so often from either the office that I work in now, or or from church or or various

other people who, uh clubs and organizations here on campus, who may
 450
 need a t-shirt design or something like that, would go ahead and and uh,
 contact me and so I'm kinda torn right now. Um, can someone help me?
 500 . . .
 (laugh) No, I ah i-it's, it's actually kinda neat to have these two various -- uh
 very diverse career plans. But it's really hard. It's it's getting harder now
 and the more I get involved in my work that I'm doing now and and still
 550
 think about what I've what I've accomplished in the past as far as art's
 concerned. It's really hard now to sit an' and uh think which one its gonna
 be. Ya know, which one is it gonna be, Ray? You know, as far as uh,
 600 . . .
 commercial art or or continuing in the counseling field as far as either in uh
 . . .
 career counselling or or going further into that. Maybe marriage and family
 . . .
 650
 counselling. Um, well time will tell, I imagine. Um, it's been three years
 now since I've been out of school, uh, since I've finished my undergraduate
 degree and um I've held off since then as far as going to graduate work,
 700
 again because of the work I've been doing. I didn't want to go to an art
 school and find out that my true love would be counseling. Um right now
 I'm seriously thinking of ah a program off campus working with one of the
 750
 other school systems. Ah extension program, uh masters in um in
 . . .
 counseling because that way I can still ah work. It's a it's a catered pretty
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 much to a person who is working and so um, to be able to do that would be
 . . .
 ideal. Uh, yet the art is still nagging at me, you know, 'cause there's still a
 . . .
 possibility of, I have ah started uh a uh certificate program in commercial

847

design and uh that's...

PART TWO: COUNTING STUTTERS

Part Two: Counting Stutters is arranged in the same format that you have become familiar with in Part One. Its purpose is to teach you to reliably and accurately count the frequency of stuttering while a person is talking, that is, as an “online” measurement. Practice begins with low frequency stuttering and advances to moderate and then high frequency stuttering. The frequency of a person’s stuttering is obviously an important measure for assessment, treatment, and posttreatment phases of the clinical process. Many clinicians and most stutterers view as a major clinical goal the substantial reduction or complete elimination of moments of stuttering. Therefore, a valid and convenient measure of stuttering frequency is required.

The speech samples of Part Two are all taken from the speech of stuttering persons who vary in age and stuttering severity. These samples also provide a good variety of forms of stuttering behavior. As in Part One, the samples increase in length and difficulty beginning with 1-minute samples of low, medium, and high stuttering frequency and progressing to 2- and 3-minute samples of mixed stuttering frequency.

Before we get started it is necessary to address the complicated issue of the definition of a moment of stuttering. It is difficult to provide exact descriptions/definitions of stutters because they take so many different forms within and across speakers and because the same behavior (e.g., a phrase repetition) might be a moment of stuttering on one occasion and not on another, or for one person but not for another. So, while it is usually not a particularly difficult clinical task to determine whether someone is a stutterer, it is clearly not as simple to determine exactly when a person is stuttering (Curlee, 1981).

Rather than attempt to describe a priori exactly what audible and visible behaviors constitute moments of stuttering, and count only those (Wingate, 1964), our experience has shown that a better way to recognize and count stuttering moments is simply to rely on the perceptual judgment of the listener. Possibly because listeners are also speakers, it appears that listeners have a natural ability to discriminate between the range of disruptions in the flow of speech that are acceptable (generally referred to as normal disfluencies), and those that are perceived to be outside the range of normal, i.e., those that appear to be stuttered. Therefore, it has been found that a good way to identify moments of stuttering is simply to listen to the speech of the person in question and count as stutters those instances of speech flow disruption that exceed one's "perceptual threshold" of normalcy. While this threshold may not be exactly the same for every listener, research has shown that measures of stuttering frequency based on such perceptual judgments of listeners are at least as reliable as those based on a priori definitions that describe particular categories of behavior as stutters (Curlee, 1981; Martin & Haroldson, 1981). Further, in our clinical experience we have found that even when a priori definitions are provided, clinicians tend to disregard them and rely more on their perceptual judgment than on those definitions, although formulation of such behavior-specific and client-specific descriptions of particular forms of stuttering can be useful to the clinician once stutters have been initially identified perceptually.

For the speech sample recordings that follow, it will be your task to listen to each and indicate, by pressing the right mouse button, whenever you judge a moment of stuttering to have occurred and release the button when judge the moment of stuttering is finished, using your own internalized, perceptual definition of stuttering. There will be more about this below.

Following is a list of directions explaining how to get started counting stutters. Read through the list before performing any of the operations. Then return to #1 and carry out the directions.

1. As above, be sure the computer has been set up properly, as in Part One. Add each sample as a new subject according to the sample number and set the run time appropriately (1, 2, or 3 minutes). No other changes to the Run Configuration screen will be needed.
2. Remember to be prepared to begin counting when the sample number comes on the screen.
3. Listen to the sample to be judged for 30 seconds or so, until you are familiar with the speaker's stuttering "style" and the kinds of stuttering behaviors you are likely to see and hear, then return to the beginning of the sample.
4. Now you are nearly ready to try your hand (ear) at counting the stutters produced by the first speaker. Whenever you hear what you perceive to be a moment of stuttering, depress the right mouse button for the duration of that moment of stuttering. (For the time being, ignore the left mouse button previously used for counting syllables. During Part Two you will count only stutters.) As discussed above, whether a particular interruption in the flow of speech is or is not counted as a moment of stuttering will be based upon your own perceptual judgment regarding whether that behavior or chain of behaviors exceeds your threshold of what sounds normal. Beyond this, a few special rules should be followed.
 - a. Tap the right mouse button one time for each syllable that contains a moment of stuttering, no matter how long the stuttering event is, or how many repetitions it contains, or how many different forms of behavior are included. As long as you perceive the speaker to be making one attempt to produce a certain syllable, one stutter is all that is counted. In the sentences that follow, the underlined sections indicate just a few of the varieties of forms that a moment of stuttering might take. Each underlined section would be counted as one moment of stuttering (i.e., one tap of the right button).
 - Huh-huh-huh-he is coming with us. (This form of stuttering is commonly referred to as a syllable or part-word repetition.)
 - He is coming wwwwwith us. (This form of stuttering is usually referred to as a sound prolongation.)
 - He is com- he is com-, he is coming with us. (Note here that an entire episode of phrase repetition is counted as *one* moment of stuttering, because all of it is one attempt to say the syllable *com-* in the word *coming*.)
 - He is kuh-kuh-kuh, (*THROAT CLEARING*) kuh-kuh-kuh, um, well um, he is, he was coming with us. (Note here that a chain of different behaviors is considered *one* moment of stuttering because it is all one continuous attempt to produce the syllable *com-* in the word *coming*.)
 - He is kuh-kuh-kuh-kuh-kuh mmmmmmming with us. (Note here that the speaker produces *two different stutters*, one on each syllable of the word *coming*. Therefore, two stutters are counted.)
 - He is k- (silent prolongation of articulatory position) -- PAUSE, SWALLOW. He is kuh-kuh-coming with us. (Note here that the speaker stutters once on the syllable *com-*, a

silent prolongation, sometimes referred to as a *hard contact* or *block*, then the speaker completely stops talking and starts "afresh", stuttering *again* on that syllable. Therefore, *two stutters* are counted because the speaker made two separate stuttered attempts to produce the first syllable of the word *coming*.

- b. Remember that you are interested in measuring the frequency of stuttering, not the frequency of all speech interruptions. That is, speakers will also display normal disfluencies and other "oddities" in their speech (e.g., prolonged speech, monotone), which, while notably different from perfectly normal-sounding, fluent speech, would not be judged to be moments of stuttering and thus should not be counted. (If such differences were highly noticeable and made a speaker's speech sound abnormal, even though they were not reflected in speech rate or stuttering frequency measures, they would be revealed by a measure of speech naturalness (see Part Four).
 - c. Be sure to watch as well as listen to the sample. Some forms of stuttering will be more noticeable visibly than audibly.
5. When you are ready to count stutters for the upcoming sample, the procedure is essentially the same as that used in Part One, but it is repeated here for good measure. Start the sample recording. When the sample speaker appears, immediately depress the computer's space bar to start the SMS timer and begin counting stutters by depressing the stutter mouse button once for each perceived stuttering event. Samples 16-24 are one minute in duration and the SMS will automatically stop accepting stutter counts at the end of one minute (because you will have set the run time for 60 seconds).
 6. At the end of the sample the SMS will automatically display the total stutter counts on the screen in the box labeled STUT. (Because every stutter counted also registers as a syllable spoken, the SYL box will contain the same number during this exercise. However, because nonstuttered syllables are not being counted during this activity, the computer cannot correctly calculate %SS, which will appear as 100% during this exercise. Ignore these numbers for now.
 7. Turn to the section of the manual that contains the summary data for Part Two (at the end of these Part Two instructions). There you will find a data sheet to be used for recording your data for the sample. On the part of the data sheet labeled Step 1, Sample 16, record the number of stutters you counted in the "1" column (first attempt). Then compare your number to the Target Range of acceptable counts shown on the data sheet for that sample. To determine the "standard" for the number of stutters that occurred in each sample, each of five experienced listeners independently marked perceived stutters on a transcript of each speech sample.³ Wherever at least four of the five listeners agreed, a moment of stuttering was marked. The Target Ranges noted on the data sheets represent the range from 5% below to 5% above the number of stutters upon which the listeners agreed for each sample.
 8. If your count is not within the acceptable range, follow the procedures described previously for repeating syllable counts:
 - Return to the sample and play/count it again.
 - On the SMS screen in the box labeled Continue, click on "Make another run with the same setting" and click "OK".

³ We (Roger and Jan Ingham) wish to acknowledge the excellent assistance of the three expert clinicians who contributed their perceptual judgments, along with our own: Susan Cole, Patrick Finn, and Roberta Jackson.

- Score the sample again and record the number of syllables you counted in the "2" column of the data sheet (second attempt). Once again compare your number to the acceptable range. If your count is still not in that range, repeat the entire process a third time and record your completed syllable count in the "3" column on the data sheet, once again comparing your data with the Target Range.
 - If, after three attempts, your count is still not within the acceptable range, return to the beginning of the sample once again. Then, find the transcript of that sample in the manual (following the data summary page). Replay the sample and recount the stutters while reading along on the transcript. Each stuttered syllable is underlined. Note that each continuous underlining indicates one moment of stuttering, i.e., one continuous depression of the right mouse button. You may want to stop periodically to see that your count is closely matching that shown on the transcript or to try to figure out the source of differences between your perceptions and the stutter judgments indicated on the transcript. Record your total count of stutters in column "4" of the data sheet.
 - After you have worked through the transcript, begin again and recount the stutters, without benefit of the transcript. Record the data in column "5" of the data sheet. Your count should be within the acceptable range by now.
9. When your count is within the Target Range of acceptability, you are ready to go on to the next sample. As you have done previously, add a new subject according to the sample number and begin counting stutters when the sample appears on your monitor screen. When each sample is completed, record and compare your data on the summary data sheet. Repeat the sample as instructed above whenever your counts are not within the specified range. Continue counting stutters in this fashion for Steps 1 through 5, Samples 16 through 30, then continue on in the manual for instructions regarding Part Three. NOTE: Speech samples in Step 4 (Samples 25-27) are two minutes long; speech samples in Step 5 (Samples 28-30) are 3 minutes long. Remember to change the run length accordingly on the Run Configuration screen when you prepare the setup for these samples. In order to do this, at the completion of Samples 24 and 27, click on "Make another run with new settings", which will produce the Run Configuration screen so that you can change the run time for the next set of samples.

PART TWO: COUNTING STUTTERS

DATA RECORDING SHEETS AND TRANSCRIPTS

Steps 1 – 5, Samples 16 – 30

Step 1: Low Frequency Stuttering

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 16						4-6 stutters
Sample 17						3-5 stutters
Sample 18						5-7 stutters

Step 2: Moderate Frequency Stuttering

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 19						9-11 stutters
Sample 20						5-7 stutters
Sample 21						10-12 stutters

Step 3: High Frequency Stuttering

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 22						19-21 stutters
Sample 23						18-20 stutters
Sample 24						17-19 stutters

Step 4: Low, Moderate, and High Frequency Stuttering

	1	2	3	4	5	Two-Minute Samples TARGET RANGE
Sample 25						1-3 stutters
Sample 26						45-49 stutters
Sample 27						17-19 stutters

Step 5: Low, Moderate, and High Frequency Stuttering

	1	2	3	4	5	Three-Minute Samples TARGET RANGE
Sample 28						32-36 stutters
Sample 29						36-40 stutters
Sample 30						5-7 stutters

Congratulations! You have completed part Two. Now, continue on in the manual for instructions regarding Part Three: Simultaneous Counting of Syllables and Stutters.

SAMPLE 16

And I was in my airbrush class and I was on a ladder with an, a-with a light table, and I don't know what happened but I fell off the ladder and twisted my knee. And it ended up that it was, it'd been broken. I didn't find that out 'til the next day t-cause the nurse at C- at City College thought it was bruised, so I went back to class on crutches and, but the next day it was so swollen that yeah- i-it was time to go have it checked, 'n' so uh we have a orthopedic surgeon that was worked on my younger brothers and sisters, 'n' he discovered that it was broken and he had to operate on it the next day and um put the put the ligame-, the ligament inside the knee had been torn out, so he had to put that back in and he sewed the bone pieces back on. And I was in a splint for about eight weeks, and after that I had to go into physical therapy because the knee wouldn't bend.

SAMPLE 17

specifically P-P-P-P-P-Pomona, where my Mom and Dad were going t-ta college. And uh, we lived there. And then we lived in like Garden Grove- I think. Some' like that for a year or so. And then we lived in Aneheim for a year maybe; then we moved out to Orange county and a place called uh B-B-B-B-B-B-Buena Park. Uh, and I went there all the way through fifth grade. And then the fourth grade, I think was the uh first time I took any kinda stuttering class. I went in for like a half hour everyday, with this ah l-lady or something like that. Yea, she, it was a lady. I don't know if she was a teacher or some kinda, some special speech person. I can't really remember. That was in uh up to fifth grade then in sixth grade we moved up to San Francisco Bay Area. Oh wait, wait, wait, go back.

SAMPLE 18

We went to the Dis- we went to Disneyland with our um with I think our yeh our friends, and then um we got ta play we got and we got to go to the Small World and we got ta go on a lotta fast rides. Um, and then we wuh-we went on the fast rides but I w- I took my mom on the thing, and she thought we were gonna fall down cuz we went on the car. It lasted (x). We saw the f- the water and I I wuh Dumbo in the cars; I went wrroo. It was fun. It almost made me, m-my mom fall off the road. M- an' and then we c-cuz then w-we met with the the little thing wasn't w-then like our cousin Jane he- she almost um I think she almost fell down in the water. And then um, and then uh we, and then we, Jane had to go home and then we stayed stayed there and then we and then we...

SAMPLE 19

My m-my problem was really really eh du- severe eh to uh to the point that that in order to say something for example, I would have to do a lot of ehstrange movements, you know, like almost like contortions or to to eh change completely my r-res my pattern of breath, you know, you see (breathes) and something like that and, you know, in ehschool when teachers s- or est- or or your peers don't understand that kind of problem you always find em, embarrassing situations and and...

SAMPLE 20

They're not that good, 'cause I used to live down in LA and they well they had some really nice waves down there. So, it worked out that, well when I came up here I was kinda like spoiled and I went to the beach and like "Wait, what is this?" Well, well, I felt like there was just some lake out there and the little tiny thing was a rippling in. It's not that much, really, compared to what I'm used to. But, I still really enjoy it. I, let me see, last time I went swimming I guess was a few weeks ago. I went down there. It was okay. I enjoyed it. Went out with some friends and stuff. But, that's my life. Fact, I used to really like to swim a lot and I was on the swim team for a while, in fact. It went pretty good. It was d- it was down at the Cathedral Oaks swim club. It's on, i-it is on Cathedral Oaks, I think about, it and were we are a member down there. We've been members down there for I don't know how long, I guess.

SAMPLE 21

i-if we i-i-if we don't be sick for a whole month, then we get to go, then we get to go somewhere um um tha-that we enjoy like Ma-McDonald's or or um or stop by Se'n Eleven, get a peice of candy, and do all those things. And I'm go- I'm I'm gone try to um to to to not be sick because last year n-no um um all the days that me and Rafael were-were in school Ra-Rafael did not even-Rafael did not even be sick one day and um and a-and he...

SAMPLE 22

um might have to hire a few people and go down there and and uh a-a bring back ore samples ou- you know, ou-out of this mine. But ah since a lot of bandidos and um, all that um it's a it's a two-day trip in and a two-day trip out by horse and what and what I-I-I have to do is hire a team and carry arms and weapons and weapons and uh th-that type of um thing down there and um basically get in there alive and uh hopefully get out alive, ya know. But i-, you know, it's a chance -- young, single, not married, and uh, ya know, it's an adventure. Kind of like In-, kind of like an In-an Indiana Jones type of a deal. True story, honest. But, you know, uh th-there's nothing concrete about it yet. And then there's also another theory of um...

SAMPLE 23

Because, if I move elsewhere um I'm losing out on on a really good therapy program. I've-I think very highly of this this program, um um it's a lot what you had to do on your own, Um, you you um have to be able to put any effort to be able to uh do the work, which the supervisors want you to do. And then at um it is um it isn't for a large cost so that you have to be able to um, ah feel that it's an important factor to become fluent, and it is for me because um it's it's something which is my major weakness --only major weakness whenever I'm interviewing. Um, if I get popped a question, "What are your strengths, what are you weaknesses?" um I always tell them that my only weakness is that uh I have a slight speech impediment when I...

SAMPLE 24

And then we uh flew from um Phi-Phila-d-delphia Airport out to ah Butte
um uh mmm(silent) a-and then uh um took a uh ch(silent) took a charter to
Twin Falls, Idaho. And v-v- and visited muh my mom's twin sister. It's sort
of um fi-f- it has always struck me that m-m my um s- that my mom has a
twin sister and she- sh- and she lives in Twin Falls, Idaho.

SAMPLE 25

but if you don't seal ca- send cards, they'll cut your um thing, too. So you better send cards and do bills.

(Prompt)

E-or else he'll cut your thing, and we don't wanna tell that. No way. 'Cause then we can't watch t-all the good things that will be on, and that way won't be happy at all. So that's why we have to do it, or a boogie man might steal your toys. That's not very happy, at all -- but. I don't know what were gonna... Um, I'm, I go to the beach a lot, an' I s- like to swim. Or, I like to go to big, deep,deep, deep, deep pools. Sometimes I even like to go to places like do shopping. An' I'm a shopping partner with my mom. An' I like to do all those things. I'm all done talking, but I can do some more if I want. (inhales) Um, sometimes, I'm gonna um go to s' um when I get home I'm gonna swim, because I want to, it's so hot. But, I'm after this I'm not gonna go straight home. I'm gonna go to the a place where um to Sears an get two pairs buh, puh, pa- two packages of panties. One flowered that ma- to match my bra shirts, and one pair white panties. And then, I'm gonna be all done and go staight home. I'm all done talking.

(Prompt)

I'm all done 'cause I don't want to say anything until I'm home.

SAMPLE 26

some ha-have uma smaller families and and um th'm um lot of families um have uh fights and uma lot of families are, you know, uhm really uh silent 'n' calm and uh-uh-uh nothing bothers 'em. Th'm uma my family uma always ha- uhma always has fought, you know, and um uhma uh th'm uma uh I am uh really um used to it, you know, now, but but uhm th'm uhma growing up it weh-w-w-was uma kinda, you know, different, you know. It was kinda shocking at times, but you know, uh families are uh families and uma I really love mine, you know. It's, it's funny. Really is. Rain. Uh, uma I think uh every um country uma th'm uma needs rain. Um ours uma gets it 'n' um uh th'm uma some-uma -times it is uh really dry and uhm uh th'm uhm sometimes it's really wet, you know, and it's really, it th'm um it a- really uma adds uma moisture, you know, and it re-th'm uhm really uh helps uh crops and, you know, and um growth and it's really good. Ghosts. Um, uh uma I don't know uma about um uh I really uma believe I mean in uh ghosts. Or well maybe not not uh ghosts but but uma uh uh th'm uma lotta times uh I feel uma presence, you know, of, you know, uh th'm uh uh maybe uma relatives or, you know, or uma maybe...

SAMPLE 27

So, I was working with um a corpus of-of emergency calls. I have a-a hundred and twenty five emergency calls that are taped. Th-this tape was made in nineteen eighty in-in Minneapolis, and uh ah-out of these tapes we have made a-a transcript, um a detailed uh account of what occurred in these calls, and our-our transcription takes a very long time. We uh s- we try to capture every sound, every pause, every stress. And so we're trying tuh to build a model of that interaction -- nn which turns were taken, how they were taken, who overlapped in talk, uh every little, every little thing that occurs in the interaction. And uh what I did, as I say, is to go in and look at how repair is organized in this one setting as opposed to how it's organized in everyday talk. And I was looking for small little kinds of changes that might occur. And um I found some. And um so the main thing that I'm looking at is how it is that talk is a-a sensitive thing to its context set. That uh all talk is not the same and in certain contexts we do things in different ways. Now that I, that's kind of a summary of what my work is. Now I can maybe go back and fill in a little bit there. Um, one of the other concerns uh I had in looking at at talk in one setting is what kind of a link is there between talk and settings. You know, what kind of a link is there b- on the one hand between social interaction and social structures. And that's uh the kind of thing that uh has-has have often been looked at in the social sciences so-s-social sciences. Oftentimes this is posed as a link between, posed as what kind of a link is

there between uh-uh things that are called...

SAMPLE 28

I can rename how small I was. Well III was probably about a little zero and, and no, pro-probably whe-when I was in my mom's stomach I wa- I was a-a fingernail. Th-that'll be kinda small. And and and I hope I don't get kids when I grow up. I think they they they can be a real pain. And and and I already know I'm not gonna have any kids ev-even if my w-wife wants to have kids. I'm saying "No siree Bob." Kids are kids are k- a lot like me. Well, II know how kids can be. Wuh- they want t'go to Disneyland or they wanna go a Magic wuh Mountain. They they want to go on the Matterhorn. They wan' do everything that they can in one simple year, or day. They w- would get sick eating apple pie, punch, a snow cone and and drink and and eating a whole house. They w-would, they would be the house instead, and they would and an' then people who li-live in that house w-would have to climb up and feed him on his little branches. And and he would give them a little ladder of his hands, and and that would do fine, but that's kinda not good. And I have a watch on, and it's it's kinda nice. It does this little thing like that. And it does everything that a little watch can, but my w-well my watch is waterproof. And see if I spit on my watch, whi-which I'm not gonna do-a-do right now; I can do it at home, no-not here because this this is a, a plubli-plubli-plu-public um um speech um um um thing. And and that says it all about those things. I, I guess I bet' think of something else. I won't take tha-that long but I'll take this long.

SAMPLE 29

Well the guy is a raging alcoholic but a great blues player and a he's standing on stage rockin' and rollin' and he fell uh-through the stage. The band's playin' p-people are dancin', and the guy fell through the floor. Broke his arm (laugh). The band still playin' kind of lookin' down on him going, "Brad, what's wrong?" ya know. He laying there kind of in bits and pieces, ya know, strings are busted, ya know, ya know, we're all kind a laughin' our a, our a, our a (laugh) our butts off about that one. And uh some, I' see, last serious band that I was in uh with uh with uh uh-two friends of mine whose brothers played in the old ahhh Neil Young Band back in a nineteen seventy five uh seventy six, somewhere in there. And these guys wrote um ah I can't think of uh the name of it off hand but uh th-th-they played with um McVee and Nicks and Fleetwood ah and Mick Fleetwood before uh they all formed ah Flee- ah Fleetwood Mac. And um I've been involved in various small projects for friends down there in Ventura, ya know, in the studio, you know. I'm a bass player now days. And um really haven't made a whole lot of money at doin' it, ya know. I uh I had one band that -- I just quit to go to machinist school and uh this-is was back when Chuck Berry was in prison for ah tax evasion, and uh a-a friend of mine's band and my band we went we went up to Lompoc prison up here in uh, when was it back in seventy...eight, I think it was. Went up and did a benefit. And I had just quit, but my band it was so bad that everything eh-

that could'a went wrong did go wrong. The corridors were shortin' out, ya know, busted strings. Chuck Berry got up there on stage, and he had his own prison band up there. And uh (laugh) um the rest of the inmates are booin' them off stage, goin' "Chuck get out a here," ya know, saying saying other various ah insults to him. And um uh they liked my friend's band better. The same guy who fell through the stage, you know, months later after this happened. They booed Chuck Berry off ah, you know, off of the stage and let th- you know, let th-the other band play f- play for about another hour and a half or so, you know. That was one experience that I thought was kinda unique. Let's see, then ah, oh, then there was the time I got arrested. Which time? Well, first time I ever was arrested in my life...

SAMPLE 30

the core of our sort of computing equipment is going to be um three or four personal computers. Um, we've ordered well, w-we have, we have two IBM XT's just arrived in the department this week, and we'll be probably getting an AT. Um, until last week I hadn't set eyes on a PC, let alone sort of been the the department expert to to to order this equipment. So, in fact, well, it will be, so it so I'm sort of doing a crash a crash course in this sort of thing in between um making, making funding requests and other, and other associated paper work. Um, we have, so the only people who really know, sort of the only people connected w-w-with the department who are sort of true experts in this sort of thing are a couple of students. And we have um we have a an extremely bright student who's just started her Ph. D. program on a special um sort of a special program um, a special project to do um a comparative report on the different statistical packages, um and other software av-v-v-v-v-v-v-v-v-vailable um for PC's. And to do her, a report which will help us. Um 'n-'n the report will actually be um will b' actually be graded and counted as part of her coursework. Uh and so she's been, she's been giving me some help over the last couple of days. She has her own um sort of IBM compatible personal computer at home and sort of is quite a whiz kid, um at this sort of thing. Um (click tongue). I...uh...let's see...my other...well, it's interesting coming into a department which is all new. It's uh, sort of turning out to be quite a friendly department and there

to be some sort of, sort of community, um some community feeling in the department um, partly I guess because it's so small, only about eight members. Partly because almost everybody is new. Um...I, possibly partly because almost everybody is from a different country so that there aren't any sort of, sort of subgroups, with the subgroups within the department. Um, my, it's um, I'm still sort of crystalizing my impressions of um California...

PART THREE: SIMULTANEOUSLY COUNTING SYLLABLES AND STUTTERS

Part Three: Simultaneously Counting Syllables and Stutters is arranged in the same format that you have become familiar with in Parts One and Two. Its purpose is to teach you to reliably and accurately count syllables and stutters concurrently. Because both speech rate and stuttering frequency are important to obtaining an empirical description of relevant dimensions of a speaker's speech pattern, it is obviously most economical to obtain both measures simultaneously and online.

A measure of stuttering frequency that is used often in published research and clinical reports and, therefore, the measure to be used through the remainder of this program, is percent syllables stuttered (% SS), i.e., the percentage of all syllables spoken that are stuttered. It is calculated by dividing the total number of stutters produced in a speech sample by the total number of syllables spoken in that sample, thus another reason for the syllable counting practiced in Part One. By thus calculating the proportion of spoken syllables that is stuttered, this measure adjusts simple stuttering frequency counts so that they take account of the number of syllables spoken. This makes possible direct comparison of stuttering frequencies in samples of different lengths and different speeds of speech. Stuttering severity would no doubt be judged to be quite different if a person were to stutter on 5 of 50 syllables spoken (10% SS) as opposed to 5 of 15 spoken syllables (33% SS).

A combination of the measures practiced thus far, speech rate (SPM) and stuttering frequency (% SS), describes important dimensions of a speaker's pattern of speaking, and provides a set of standard, empirical measures that can be used to assess and compare a client's speaking performance prior to and throughout all stages of treatment. In combination with a measure of speech naturalness (Part Four), a rather complete picture of a person's speech can be obtained.

What follows is a list of directions explaining how to get started counting syllables and stutters concurrently. Read through the list before performing any of the operations. Then return to #1 and carry out the directions.

1. As above, be sure the computer has been set up properly, as in Parts One and Two. Open each sample via "Add Subject" according to the sample number, starting with sample 31, and maintain the same Run Configuration selections used previously. The first samples are one minute in duration.
2. Be prepared to begin counting when the sample number comes on the screen.
3. Listen to each sample for 30 seconds or so to become familiar with the speaker's speech pattern before you begin to count syllables and stutters.
4. Now you are ready to use your eye-ear-hand coordination to combine the measurement of syllables and stutters. Once the sample begins and you have activated the computer by pressing the space bar, depress the left mouse button for each nonstuttered syllable produced by the speaker, and depress the right mouse button each time you judge a moment of stuttering to have occurred. As you know, signaling the occurrence of a stutter by pressing the right mouse button will also automatically add one syllable to the syllable count. That is, it is assumed that when a speaker stutters, he or she is attempting to produce a particular syllable -- the syllable that is appropriate to the intended word -- and it is that syllable that is stuttered. Therefore, two events must be recorded: (1) the occurrence of the stutter, and (2) the occurrence of a spoken syllable (albeit a stuttered one). The computer records these two

events simultaneously when the occurrence of a stutter is signaled. At the end of the sample, on the data summary screen, two totals are available: the total number of syllables spoken and the number of those that were stuttered. The computer uses these numbers to calculate SPM and %SS, also displayed on the data summary screen.

Let's look again at the examples of different forms of stutters that were presented as illustrations in Part Two. In the sentences that follow, nonstuttered syllables, which would be noted by pressing the left mouse button, are indicated by dots, and stutters (stuttered syllables), which would be noted by one depression of the right mouse button, are indicated by continuous underlinings, the way they are shown in the transcripts. Beneath each line Ls and Rs (Left, Right) illustrate the order in which the mouse buttons would be pressed as the listener follows the speaker's ongoing speech. The total number of syllables and stutters that would be counted for each sentence is also indicated.

- Huh-huh-huh-he is coming with us. 6 syllables
R L L L L L 1 stutter

- He is coming wwwwwwwwith us. 6 syllables
L L L L R L 1 stutter

- He is com- he is com-, he is coming with us. 7 syllables
L L L R L L L 1 stutter

- He is kuh-kuh-kuh, (THROAT CLEARING), kuh-kuh-kuh, um, well um, he is,
L L R 6 syllables
he was coming with us. 1 stutter
L L L

- He is kuh-kuh-kuh-kuh-kuh mmmmmmming with us. 6 syllables
L L R R L L 2 stutters

- He is k- (silent prolongation) - PAUSE, SWALLOW. He is 9 syllables
L L R L L 2 stutters
kuh-kuh-coming with us.

5. When you are ready to practice simultaneous counting of syllables and stutters, restart Sample 31, press the space bar when talker begins speaking, and use both the syllable and stutter mouse buttons as described above, until the sample is over. In Part Three, the first three samples are 1-minute long, the next three samples are 2-minutes long, and the last three samples are 3-minutes long. They vary randomly in regard to speech rate and stuttering frequency.

6. When the sample is completed turn to the summary data sheet (located at the end of these Part Three instructions) to record your data from this sample. Note that the data sheet requires that you record the following data, all of which appear on the data summary screen:
 - total number of syllables spoken
 - syllables spoken per minute (in samples longer than 1 minute),
 - total number of stutters
 - percent syllables stuttered.
7. As before, if your data are *not within* the indicated range of acceptable scores, repeat the sample, referring to the accompanying transcript if you are not successful after three independent attempts. Record your data in the appropriate spaces on the data sheet for each attempt.
8. When your data *are* acceptable for one sample, move on to the next until you have completed Part Three (Steps 1 through 3, Samples 31 through 39).

PART THREE: SIMULTANEOUSLY COUNTING SYLLABLES AND STUTTERS

DATA RECORDING SHEETS AND TRANSCRIPTS

Steps 1 – 3, Samples 31-39

Step 1

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 31						160-176 syllables/SPM 18-20 stutters 11% SS
Sample 32						84-93 syllables/SPM 19-21 stutters 20% SS
Sample 33						219-243 syllables/SPM 6-8 stutters 3% SS

Step 2

	1	2	3	4	5	Two-Minute Samples TARGET RANGE
Sample 34						324-358 syllables 169-179 SPM 6-8 stutters 2% SS
Sample 35						467-517 syllables 234-259 SPM 6-8 stutters 1% SS
Sample 36						233-257 syllables 117-129 SPM 47-53 stutters 21% SS

Step 3

	1	2	3	4	5	Three-Minute Samples TARGET RANGE
Sample 37						611-675 syllables 204-225 SPM 9-11 stutters 1% SS
Sample 38						494-546 syllables 165-182 SPM 28-30 stutters 6% SS
Sample 39						244-270 syllables 81-90 SPM 48-54 stutters 20% SS

Congratulations! You have completed Part Three. Now, please continue on in the manual for instructions regarding Part Four: Rating Naturalness.

SAMPLE 31

I could do the best. Uh, and so I I had some stock at the time, which I sold
uh 'gainst my dad's will, but I did it. Uh he gave per-permission, and I told
50
him what I was guh- I was going to do and he didn't want me to do it at all,
but uh I basically did it without his per-permission. I got got the uh money
from the stocks, and made airplane reservations, and basically left him a-a-a
100
note and his keys and his credit cards, and told him that I was gonna do
what I wanted to do. And that's when my, when my life got real good, from
that point on. Uh, d-during this, the c-course of uh of uh leaving my mom
150
in New Mexico, going into th' (silent) in and out of the uh Navy, and uh
168
leaving home to go. . .

SAMPLE 32

‘n’ anyways we uh um b-both agreed to t-to uh dr-drive up and then a friend
of mine um just got his um entry back uh from the tournament and and he
50
said he w- he was accepted to goo go up also. And uh th- that guy’s a six.
And so a-a-a-a-all of us had duh-da uh pretty uh g-good chance in playing.
Um but a-as it, as it turned out we uh-duh-dr we drove up on uh Sa-Sa-
89
Saturday morning. . .

SAMPLE 33

you look at a lot of them there's a-a structure to them. And uh like all
encounters they have, uh you know, openings and closings, and these kinds
50
of openings and closings are, uh you know, u-u-unique to the kind of setting
that it is. And ah y- in emergency calls the way that it-it-it's opened usually
is, as you can imagine, there's a ring and then th-the person 'n' the other
100
end answers, and they say something like, uh you know, "Mid-City
Emergency." So they identify themselves. And then in the following turn
uh th-th-the caller will say, you know, wh-why it is that they're calling, that
150
they have a, you know, request for assistance or y' complaint or something
like that. Then through a series of turns w- um a question-answer thing, uh
200
uh the, uh you know, complaint-taker uh gathers information, and finds out
the address, and who's involved, and things like that. And what's interesting
231
is that the way that it turns out in talk is that they're in turn. . .

SAMPLE 34

has beast man and he has this guy that has long ee-eyes, he goes, the eyes go
nnnn geek. Like if you, like if he can't see something he gets his eyes and
50
goes mmm, and they go way far out and then somebody sees 'em and they
go voom wo- back into his eyes. A-and he has um, and then He-Man has, he
has some more kids that I can't think of 'um. He has Evil Lynn. She's a,
100
she has a, she has a lot of tricks. Like she took -- this guy wanted to be just
like He-Man cuz He-Man was big. And (sniffs) this guy want' to be just like
He-Man, but he was too um small, so he and he wan' to have a sword and
150
everything. (sniffs) A-and then um um H-He-Man has --. Only Orco and
the Sorceress and Madam Arms know that he's he isn't He-Man he's He-
Man and he's um, I think yeah, he's um, Adam. When he t- he ch- he-he
200
goes "by the power of grace uh I have the power." And then he changes, and
then when s- um when he he-ha he has the cat and then he, he get it done,
turns it to the cat, he say and it's a Battle Cat, and He-Man gets on his back
250
and he ri-rides with it. He rides with his Battle Cat in the battle. He's a he-
he's you w-when-when he, when he changes him, he, when he's just a cat,
he he's d- he's afraid of, he shakes and everything cuz he's afraid of
300
everything. When he um when when, cuz when he's, when he's brave. But
when he's um, but when he's um, when he's just , when he's just playing,
341
when he's just playing, when he's just um, when he's um Battle Cat he...

SAMPLE 35

It works out okay. Except I think that if a cop came by, it would kind of be
kind of hard. I don't know, I think that they would arrest you or something
50
like that. But I've never really had any trouble with that yet (laughs).

Okay. Haahh. Well, well, one of the nice things about my car is I have this
radio. I, and I yuh-, and I just got this radio about four or five months ago.
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And it is nice. I like it. (laughs) I spent all the money I had. Fact, I had to
borrow some money from some friends to pay for it, 's I wanted it so bad.
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But I really enjoy it. See, well, I just love music, to tell you the truth. I go
crazy over music, in fact. I listen to it all the time. Well well when I wake
up in the morning, 'cause I flip on the radio so I don't go back to sleep, so
200
the music keeps me going in the morning. Well, then I sometimes even take

a shower with the radio on, 'cause there's this little tiny radio that I bring,
250
well, into the bathroom. And if there's this really good song that I want to

hear which is on the radio when I was just about to go in, I just plug it in
and listen to it. I do that every now and then. And whenever I work with
300
my con-, I have contact lenses, 'cause I don't like wearing glasses that much

anymore, 's they fog up and stuff. But whenever I put in my contact lenses
350
or brush my teeth or anything, the radio is always on in my bedroom. The

bathroom is just right down the hall 'n' I always keep it loud enough so I
can listen to it. Works out kinda nice. And my radio is always on in my
400

car. I don't think there's ever been -- oh wait, there was one time I was

mad. The radio was off. But that's very, it's not that common at all. And

I don't know, I just love it (laughs). I like all kinds of music, too. Well I
450

guess classical 's okay. I don't listen to it, though. Mostly I just listen to

rock; I like some soft, some heavy. I like a little bit of jazz, like, what other
492

kinds are there?

SAMPLE 36

Th'm uh um th'm uhm Arden Farms. Um he worked w-w-th'm uhm worked there for about thirty years. Uh th'm uma my mom uma used to-to own um uma Adobe Duplicating uhma Printing Shop. Uhm she did that for about 50 fifteen years. Um I uma used to-to uma work there years ago uma doing uma mail clerk work, you know. That's uma what I'm I'm doing now. Um, anything else interesting? Governor. Government. I don't really understand 100 uhma government. Uma uh th'm uma uh I don't um really like it, you know. A lot of things uhm happening uma nowadays. You know, it's not fair. Uhm especially these um these uma bombings and all that and fighting 150 fighting uma going on, you know. It's just not fair. Secretary. Uh I think uma secretaries uma are are um great. Um I don't uh really have uma secretary skills, and I really, you know, uh-eh-eh th'm envy them very much. 200 Fruit. Um I think fruit is uma really fantastic uh for you. It's full of of uh fiber and, you know, uhma everybody needs fruit, 'n' th'm uma fruit salad's great. Flight. Good topic. I think right now th'm uma a lot of people are- 245 are um. . .

SAMPLE 37

then now I'm ambidextrous, which is nice thing to be. Uh, later the
psychologist I went to said that it was probably a uh problem with my first
50
grade teacher being an authoritative figure, kinda like he thought it was a
problem with the same sex image, like a mother image. But that didn't seem
to make a whole lotta sense. Uh, but I think the worst part of it when I was
100
younger was the fact that the other students would made such a m- thing
about teasing that you got, you became quite introverted. I think that's part
of the problem that a lot of stutterers have -- that when they're, th- w-when
150
the people around them make a big deal out of it, they um get self-conscious
about it and it makes it worse. (takes a large breath). B'anyway it continued
until (breathes out) I staught, I sought my own therapy because the school's
200
therapy didn't seem to work, so I tried self-hypnosis and that was uh not
helpful, but at least it got me to learn how to relax in certain certain
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instances. And usually when I went in to be tested at schools I was able to
control my stuttering so I wouldn't, 'cause usually they'd call you in and
wouldn't tell you why they called you in, 'cause the teacher would usually
300
recommend that you had a speech problem, so they'd send you to the
counselor and they- you'd get called in and they'd have you read something,
and of course you knew what it was about so you'd try not to stutter, and and
350
in my case I usually didn't in that case. But then I'd go back to class and I
would have a problem. When I first moved to California (pause) th- when

I - f-they first sent me to a uh, uh person to help me with my speech, they ah
400
they had me read something and they said it was because I had a s- m- I I
had a southern accent was the reason why I had a stammer. So they didn't
450
give me any therapy at that time, but then the next year, at the junior high,
they, I had a teacher that was more aware and he realized I was a problem,
I had a problem. So they took me in again and they gave me therapy, but
500
they took me out of my math class to give me my therapy and my math c-
teacher, I was good in math, still am. So my math teacher uh didn't like it.
550
So that didn't continue for very long either. And then I went to a (sigh) uh I
guess this is musta been in my ehh in my later life after I finished school,
cause in sa- when I w-con-continued in school, mean sometimes I could, ya
600
know when they ash-ask you to read something in class, you couldn't even,
I couldn't even get through a sentence. And then other times uh I'd be
alright. But usually I have most trouble in front of groups or over the
643
telephone.

SAMPLE 38

Uh, th-this created uh quite a problem in school for me, as one could
imagine, uh, given the fact that uh sometimes children can be pretty cruel to
one another. Uh, I'd say it caused me a great deal of problem in school and
um preven-prevented me really from adapting well to the educational system
that I was in at that time. Ah, I don't think that my teachers understood it
very well. Ah, I recall that uh they they made what I would call some very
bad mistakes, Uh, like this doesn't have anything to do with my stuttering -
but, uh, I recall when I was being first taught mathematics uh they taught me
how to add and subtract on my fingers so, which has been a pro- a problem
to me up until the invention of calculators. Uh, I don't use my fingers
anymore, but-uh I-I never did learn to calculate i-in my head. But of course
along came calculators and, you know, that just complete- completely took
care of that. Uh, I have quite a few of them in strategic lo- lo-locations in
my life so uh. . . But uh anyways uh I first recieved help for the problem, I
guess what would be maybe the f-s-second grade of elementary school
basically. Uh, the guy was a speech therapist, as I recall. I recall his name is
Doctor _____, and I recall that my uh mom would come pick me up
from school 'bout nine o'clock in the the morning and we would drive over
to Newark uh and uh I would see-see this guy. Uh, I recall pretty clearly uh
a lot of things that-that-w-that went on with him. Uh, I think um most of all
I recall his office. Uh, it was a big brick building, a old building, and his

400

office was like the uh living room of a, of an old house. There was a big
fireplace in it, and a wooden floor and lots of old furniture. And uh we-we

450

talked a lot. Uh, uh the things that I recall us talking about didn't pertain to
speech much, uh but I do understand he was a speech therapist. Uh, but uh

I think we talked mainly about little idiosyncracies that I had, that I think my
500

my parents had t-turned him on to. But uh I don't think we accomplished uh
520

very much at all.

SAMPLE 39

a couple years ago um our family went to um three or four um st- three or
three or four st- three or four states on a um on a v-vacation and then um uh
50
visiting some uh relatives and stuff. And uh we- we lived um in uh
Pasadena, and we um flew uh back to uh Lig- back to Ligonier,
Pennsylvania. And we um v-visited m- all of m-my f-father's family. Um,
100
he's got a brother and a sister back there. Uh his brother uh s-sells insurance
and and and his sister is a j- (silent) is j- is just a wife. But anyways um we
150
uh start- w- we started out um uh l-l-l-l-l-looking at all the things in
Ligonier. And we saw uh vuh-vvv- we saw Valley Forge and all the uh uh
uh r-r-relics of the uh war and stuff. And saw a-a where everybody slept and
200
stuff not - and that was really neat. And then uh we um drove up to uh
Ph-Ph-Philadelphia and we uh- wen-wen we-we we went to see the Liberty
Bell and back then um it it was st- it was still inside and um y-you were able
250 . . . 257
to walk up to it and uh y-you were um um actually. . .

PART FOUR: RATING NATURALNESS

Part Four: Rating Naturalness is arranged somewhat similarly to the practice format with which you're now familiar. Its purpose is to teach you to incorporate ratings of speech naturalness in your data collection procedures. When you have completed this section, you will be able to count syllables and stutters and rate the naturalness of a sample simultaneously. Then you will have accomplished the goal set forth at the beginning of this program: to be able to assess the three major dependent variables that are fundamental to describing, empirically, vital characteristics of the speech of people who stutter.

Although speech rate and stuttering frequency are important characteristics of speech production, it has become clear that they do not provide a complete picture of a person's speech – and especially the posttreatment speech of people who stutter. For example, speech following treatment may be stutter free and within normal speech rate ranges, yet still sound stilted or artificial or cautious- i.e., unnatural⁴ (Runyan & Adams, 1978; 1979). Or, a child learning to change stuttered speech to fluent speech may attempt to rely on sing-song speech or unusual animation to produce fluent utterances. These aspects of speech naturalness are not necessarily captured by SPM or %SS data.

The concept of speech naturalness encompasses many aspects of speech beyond rate and fluency, including prosody, vocal quality, placement and length of pauses, expressiveness, articulation, syntax and semantics, discourse conventions, and other less well-defined features. Because of this multiplicity of characteristics, only some of which may be relevant to a particular person's speech, we have selected as our measure of naturalness a perceptual rating scale developed by Martin, Haroldson, & Triden (1984). It is simple to use and has been shown to be highly reliable (cf, Ingham, 1985). The clinician/judge merely listens to a sample of speech and then rates its naturalness according to a 1-9-point scale where "1" means the speech sounded "highly natural" and "9" indicates the speech sounded "highly unnatural." Ratings between "1" and "9" indicate perceived degrees of naturalness of between those extremes. Martin et al. (1984) found that speech naturalness ratings for normal-speaking adult talkers averaged 2.3. A rating of "3" is typically considered the uppermost boundary of "normal naturalness" (Ingham, 1985; Ingham, Gow, & Costello, 1985; Ingham & Onslow, 1985; Schivetti & Metz, 1997).

The next section of this training program will present speech samples that you have previously heard of nonstutterers and stutterers. The samples are one and two minutes in length and present speech that illustrates various components and degrees of naturalness. Following is a list of directions explaining how to get started rating naturalness. Read through the list before performing any of the operations. Then return to #1 and carry out the directions.

1. As above, be sure the computer has been set up properly, including adjusting the volume level for the audio tone. Add each sample as a new subject according to the

⁴ Barbara Van Kirk Ryan calls this "egg shell fluency." She says, "It's not what it's cracked up to be!" ☺

sample number. On the Run Configuration screen, input the proper settings, as follows.

- Steps 1-4 (Samples 40-51) are one minute in duration. Speech samples in Step 5 (Samples 52-55) are two minutes long.
 - You will not be counting syllables or stutters during the first several samples. You will use your number keys on the keyboard to make your 1-9 Naturalness rating.
 - Reset the Run Configuration screen Click on “Display Naturalness Rating, Continuously.” This will make a box for naturalness ratings on the screen while data are being collected.
 - Add the components required for rating naturalness. First, click in the box beside “Rate Naturalness” (top, far right column) to turn on this function.
 - Then, in the box beside “Rating Period”, type in 60. This means that the computer will ask you to make a naturalness rating for every 60 seconds of speech, which will be at the end of each of the one-minute samples and at the middle and end of the two-minute samples.
 - Next, click “Tone Prompt”, so that you will receive an auditory signal from the computer when it is time to input your naturalness rating.
 - All previous settings on the Run Configuration screen should remain as previously set.
2. Remember to access sample number on the SMS site. Prepare now to listen to Sample 40.
 3. Before rating, play a brief bit of the sample so that you are familiar with the speaker’s style of speech and have a general idea of its naturalness.
 4. Now you’re ready to rate the naturalness of the samples that follow in Steps 1-3. All samples are one minute in duration. Step 1 will present three samples of nonstuttering speakers; Step 2 contains three samples of stuttering speakers; Step 3 contains samples with varying degrees of naturalness. Your job is to listen to each sample and concentrate on its naturalness, having in mind a rating between 1 and 9. When the naturalness tone sounds and the NA signal appears in the bottom left corner of the screen, use the number row on the computer keyboard to indicate your rating. You must press a number key within 5 seconds of the signal. At the completion of the sample the computer will automatically display your naturalness rating on the data summary screen. For samples that require multiple naturalness ratings, the cumulative averaged rating will be displayed in the NAT box during data collection, and the final averaged naturalness score will appear on the data summary screen at the end of the sample.
 5. When you have completed the naturalness rating(s) for a given sample, turn to the data summary page in your manual (which follows these instructions for Part Four) and compare your ratings to the ones shown there. To determine the “standard” for these naturalness ratings, 27 judges (naïve undergraduate students) observed all of the speech samples contained in Part Four, each divided into 60-second segments. Each

judge independently rated each segment on the 1-9-point rating scale following the same instructions given to judges by Martin et al. (1984). Without previous knowledge that they would be recalled, one to three weeks later all judges re-rated all of the samples. Only ratings from judges whose first and second ratings were reliable (within ± 1 rating unit) were included in the final calculations (20 of the 27 judges; 10 males and 10 females). The Target Ranges noted on the summary data page represent the ± 1 range around the averaged ratings of this group of judges for each speech sample.⁵

6. If your rating is not within the acceptable range, listen to the sample a second time, keeping in mind the naturalness rating assigned to that sample on the data sheet. This should serve as an exemplar of that particular rating scale value.
7. When your count is within the Target Range, continue to the next sample. Stop this process when you have completed Step 3 and read the following paragraph before you begin Steps 4 and 5.

Instructions Regarding Steps 4 and 5, Naturalness Rating

In the three, one-minute samples of Step 4 (Samples 49-51) and the three, two-minute samples of Step 5 (Samples 52-55) you will integrate all of your new skills and simultaneously count syllables, stutters, and make naturalness ratings at one-minute intervals. You can do it (although it may require a bit of extra practice)! After you add a new subject for Sample 49, reset the Run Configuration screen as follows.

- Run Length: 60 seconds for Samples 49-51 (120 seconds for Samples 52-55.)
- Display Timer: ✓
- Start/Stop Tones: ✓
- Display Syllable Counts: ✓ “Continuously”
- Display Stutter Event Counts: ✓ “Continuously”
- Rate Naturalness: ✓
- Rating Period (sec): type in 60
- Tone Prompt: ✓
- Display Naturalness Rating: ✓ “Continuously”
- Click “OK.”

Now you’re ready to put it all together! As soon as the sample speaker appears on the monitor, depress the space bar to start the SMS and immediately begin counting syllables and stutters. Concurrently, keep in mind your judgment regarding how natural the speech is sounding so that when the naturalness signal is presented you can quickly touch the number that describes the previous minute of speech. NOTE: The clock and the speaker continue during this time, so it is imperative to be prepared to depress the appropriate number key immediately and then return to counting syllables and stutters. Sometimes it’s necessary to “catch up” on any syllables or stutters that were missed while you were making your naturalness rating.

⁵ We owe special thanks to Alison Scheer who conducted the naturalness standardization experiment.

At the completion of each sample, check your ratings with those of the summary data sheet (located at the end of these instructions for Part Four). If your data are *not* within the acceptable range in any category (SPM, %SS, or Naturalness), repeat the sample until your data are satisfactory.

Continue practicing the simultaneous recording of syllables, stutters, and naturalness in this fashion for the remainder of Part Four. When you're ready to begin Part Five, the Criterion Test, read on in the manual.

PART FOUR: RATING NATURALNESS

DATA RECORDING SHEETS AND TRANSCRIPTS

Steps 1 – 5, Samples 40 – 55

Step 1: Nonstuttering Speakers

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 40						2-4
Sample 41						3-5
Sample 42						3-5

Step 2: Stuttering Speakers

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 43						5-7
Sample 44						4-6
Sample 45						6-8

Step 3: Varied Naturalness

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 46						5-7
Sample 47						3-5
Sample 48						6-8

Step 4: Varied Naturalness

	1	2	3	4	5	One-Minute Samples TARGET RANGE
Sample 49						219-243 syllables/SPM 6-8 stutters 3 %SS 4-6 NAT
Sample 50						101-111 syllables/SPM 10-12 stutters 10 %SS 6-8 NAT
Sample 51						107-119 syllables/SPM 9-11 stutters 9 %SS 6-8 NAT

Step 5: Varied Naturalness

	1	2	3	4	5	Two-Minute Samples TARGET RANGE
Sample 52						262-290 syllables 131-145 SPM 1-3 stutters < 1 %SS 4-6 NAT
Sample 53						240-266 syllables 120-133 SPM 45-49 stutters 19 %SS 7-9 NAT
Sample 54						393-435 syllables 197-218 SPM 17-19 stutters 4 %SS 4-7 NAT
Sample 55						377 – 417 syllables 189 – 209 SPM 5 – 7 stutters 2 %SS 3 – 5 NAT

Congratulations! You have completed Part Four. Now, continue on in the manual for instructions regarding Part Five: The Criterion Test. Time to see what you've learned!

PART FIVE: THE CRITERION TEST

Now you're ready for Part Five: The Criterion Test, which is included for the purpose of evaluating whether you have acquired the ability to make online simultaneous measurement of the syllables, stutters and speech naturalness produced by a variety of speakers who stutter. This part of the SMS training program contains eight 3-minute samples not presented before. The task is exactly the same as the one you just completed in Part Four, i.e., that you simultaneously count syllables and stutters and rate naturalness at one-minute intervals for each speaker while watching and listening to the speech samples. For the purpose of the Criterion Test, however, you will have only one opportunity to view and record the speech parameters of each speaker.

When you have passed the Criterion Test, you should be capable of using this manner of data collection conveniently and accurately to describe important dimensions of the speech patterns of people who stutter throughout the course of assessment, treatment, and follow-up. We hope that you and the clients you serve will benefit from your participation in this program.

What follows is a list of instructions explaining how to take the Criterion Test. Review them first, then return to #1 and begin.

1. As always, set up the SMS, adding a new subject (Sample 56), setting the run time for 3 minutes (180 sec), and maintaining the other settings used for the last samples in Part Four.
2. Listen to a bit of each sample before you begin recording data so that you are familiar with each speaker's speech pattern. Return to Sample 56, and begin.
3. When you have reached the end of the first sample turn to the Criterion Test data sheet in the manual (at the end of these instructions). Record your data in the spaces beside each sample number, and forward your data sheet to your instructor. The instructor will compare your numbers to the acceptable ranges.

The references that conclude this manual provide readings regarding assessment issues and procedures that incorporate these measures and that will help you develop useful measurement procedures for your own clinical and research endeavors with persons who stutter. We hope you will read them and find them useful.

PART FIVE: CRITERION TEST

DATA RECORDING SHEETS

Samples 56-63

SAMPLE	YOUR DATA	TARGET RANGES*
56	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	
57	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	
58	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	
59	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	
60	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	
61	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	

62	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness	
63	Syllables:	
	SPM:	
	Stutters:	
	%SS:	
	Naturalness:	

* Please forward your Criterion Test answers to your instructor. The instructor will provide feedback as to whether or not your scores were within the Target Range.

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APPENDIX

This appendix describes all of the options for data collection available in the Stuttering Measurement System (SMS), only a few of which have been utilized in the preceding training program. However, all of the skills acquired in the training program are fundamental to using the various data collection options. These options make the SMS extremely flexible and accommodating to a variety of clinical and research measurement goals.

To fully utilize the following descriptions, it will be helpful to have the SMS on a computer screen accompanying your reading. Begin with the first screen (after the credits have faded).

FIRST SCREEN

SELECT SUBJECT. Clicking on SELECT SUBJECT opens the directory of names of persons for whom SMS data have previously been collected. The list is presented in alphabetical order according to last name. If you wish to add more data to a given person's existing file, highlight the name by clicking on it, and then click on "OK" or touch the Enter key.

NOTE: Throughout the program "hot buttons", which can be activated either by clicking on them or by touching the Enter key, are noted by a darkened border.

(Clicking on "Cancel" will close the directory without a name being selected.) Once you have selected a person's name, you are able to proceed to use of the SMS to collect additional data, which will be recorded in that person's file, or to view previously collected data. (See BROWSE below.)

SMS. Clicking on SMS will bring up the Run Configuration screen, which presents all of the data collection options available. Before this, a warning sign will appear reminding you to shut down on your computer all non-SMS applications before advancing further. After this has been done, click on "OK" or touch "Enter." (Explanations of items on the Run Configuration screen are explained below. For now, touch Escape [Esc] to return to the first screen.)

BROWSE. Clicking on BROWSE will open the data file for the selected subject. All data previously collected are included according to the date and time, run number, and duration of the sample. The parameters included are: number of syllables spoken (SYL), number of stutters recorded (STUT), number of intervals during which stuttering occurred (SI), average number of syllables spoken per minute (SPM), average number of syllables spoken per minute during stutter-free intervals (SFSPM), percentage of syllables stuttered (%SS), percentage of intervals containing stuttering (%SI), and average naturalness rating (NAT). A minus one (-1 or -1.00) will appear in any column for which data were not collected. For example, if the data were not collected in intervals, -1 or -1.00 would appear in the columns labeled SI, SFSPM, and %SI. (Further description and calculation

of each of these treatment efficacy measures are included as the last item in this appendix.)

The lower right hand corner of the display offers the user the opportunity to print out any or all of the data stored in the computer for the particular subject by indicating the starting and ending run numbers and clicking on PRINT. (Naturally, your computer must be connected to a printer for this application to function.) CLOSE will closed this data file and return you to the original screen.

ADD SUBJECT. Clicking on ADD SUBJECT allows a new person's name to be added to the directory. If a person's name does not already exist in the directory, this must be done before opening the SMS or the BROWSE components. The person's first and last names are typed in a indicated, and the SMS modifier is already provided. "Add" stores the person's name in the directory. "Close" closes this file. Once a name has been added, it is necessary to open the directory and select the name (SELECT SUBJECT) BEFORE CONTINUING FURTHER. So that you will be able to follow the SMS instructions that follow, add a subject name, perhaps your own name or a "John Doe", now.

DELETE SUBJECT. Clicking on DELETE SUBJECT opens the directory. To delete all any person's data from the computer, highlight the person's name and click on "Delete", or touch the Enter key. Then close the file.

RUN CONFIGURATION SCREEN

Now we are ready to learn about all of the data collection options available in the SMS. To open the Run Configuration screen, turn off all other applications on your computer, select a subject (as described above), click on SMS at the top of your screen, and indicate "OK." The Run Configuration screen will then appear. The top line indicates the name of the subject selected, that this is the SMS program, and the run number that will be recorded.

Run Length. Each individual speaking trial or separate speech sample is referred to as a "run." The SMS program has two methods for automatically predetermining the length of a run. The Run Length option allows the user to preset the *duration of time* for which data will be collected. For example, if a speaker were to be providing a 5-minute long reading sample, the Run Length would be set at 5 minutes (300 seconds). When the reading begins, the person recording the data would press any key on the keyboard to start the clock and begin counting syllables and stutters, etc. until the time expired. The timer can be set for any duration. Clicking on the arrow in the Run Length box opens the box (indicated by the blue color) so that any number of seconds can be inserted by typing in the desired Run Length. It is also possible to select one of the predetermined run lengths y clicking on the up or down arrow and then clicking again to save the desired number (by turning the blue background to white).

Display Timer. Clicking once in the box so that a check mark (3) appears means that the computer screen will show the timer on the screen during data collection, starting at :00 and continuing until the end of data collection. Of course, if the Display Timer box is not clicked, the computer's timer/clock will continue to work, but it will not be shown on the screen during data collection.

Run Summary Printout. Clicking in the box so that a check mark (3) appears means that following the end of the data collection for that run, your printer will produce a printout of the numbers, in the same way that data can be printed out by clicking on BROWSE, as described above. If you wish to have a printout of each run, as it occurs, click here. If you'd rather have one printout of several runs, it is more convenient to obtain that printout through BROWSE, after the data are collected.

Pause Control. Clicking in this box makes the computer clock stop during data collection whenever the speaker stops talking longer than a predetermined amount of time (i.e., whenever no mouse button presses have occurred for a certain amount of time). This means that the summary data, especially speech rate data, will be based upon *actual talking time*, rather than *elapsed time*. Therefore, if the Run Length is set for say, 180 seconds (3 minutes), this means the actual run length will be determined by how long it takes for the speaker to produce 3 minutes of speech. The clock on the screen during data collection will display talking time, not elapsed time, and will stop whenever no mouse button presses are occurring. This option is especially useful, for example, when the speech sample being analyzed is a conversation sample or is from a treatment session with the clinician. The option allows the time utilized by the conversation partner or clinician to be excluded from the data analysis.

Trigger Interval. When the Pause Control is used, it is necessary to indicate the length of a pause that will "trigger" the clock stoppage. Any interval from 0.1 to 5.0 seconds can be used by typing in the Trigger Interval box the desired number of seconds, or by selecting a number by clicking on the arrow and then clicking on the number until it occurs in the Trigger Interval box and the blue background has been removed. We typically elect 1.3 seconds as our Trigger Interval (therefore, this is the SMS's default interval), based upon findings by Bruce Ryan indicating that naturally occurring pauses in ongoing speech are typically less than 1.3 seconds in duration (Ryan, personal communication, 1993).

Mousebutton Configuration. When this box is ticked, depression of the mouse button on the left signals stutter-free syllables, and mouse button presses on the right count stuttered syllables. The occurrence of a stuttered syllable is also counted in the total syllable count (SYL) displayed on the screen during data collection.

Start/Stop Tones. When this box is ticked, the computer will produce a brief tone (coinciding with the depression of any key on the keyboard) to signal the start of data collection and another tone when the run has been completed.

Use Syllable Mode. It was mentioned above that the SMS provides two methods for automatically setting the length of a run. The first is specification of Run Length (see above), and the second is Syllable Mode. In the Syllable Mode method the duration of a run is determined by the number of syllables spoken, irrespective of the time required to produce those syllables. For example, one may wish to collect data on 500-syllable speech samples (for example, see Ingham & Riley, 1998). If number of syllables spoken is to be the determiner of the length of a run, the user would tick the Use Syllable Mode box and then select the Syllable Count Target (desired number of syllables) by typing the number into the accompanying box. When Use Syllable Mode is ticked, the Run Length option is disabled. These two methods of determining the length of a sample are mutually exclusive. When Use Syllable Mode and Display Timer are both ticked, the computer screen during data collection will display the timer, which will stop at the end of the sample, indicating the time that will be used in SPM calculations. When Use Syllable Mode and Pause Control are both ticked, the clock will pause whenever mouse button presses have not occurred for the time indicated as the Trigger Interval (as described above). The Syllable Mode can be used with or without the Pause Interval being activated. (NOTE: Some computers may not be fast enough to stop the run precisely at the selected Syllable Count Target, especially if syllable button presses are occurring very rapidly. One or two extra syllables may be counted.)

Display Syllable Counts (Continuously or Periodically). When either of these boxes is ticked, during data collection the accumulating syllable counts (corresponding to mouse button presses) will be displayed on the screen.

Display Stutter Event Counts (Continuously or Periodically). When either of these boxes is ticked, during data collection the accumulating stutter counts (corresponding to right mouse button presses) will be displayed on the screen.

Display Stutter Interval Counts (Continuously or Periodically). If intervals are to be used in the analysis of stutter counts, then when either of these boxes is ticked, during data collection the accumulating number of intervals judged to contain stutters will be displayed on the screen. Use Intervals (see below) must be ticked first; then the Display option will operate.

Display Naturalness Rating (Continuously or Periodically). If naturalness ratings are to be used during data collection, then when either of these boxes is ticked the accumulating averaged naturalness ratings will be displayed. Rate Naturalness (see below) must be ticked first; then the Display option will operate.

Rate Naturalness. Clicking this box sets the program to accept periodic naturalness ratings, based on numerical ratings indicated via the numbers keyboard. As described in the manual, we use Martin et al.'s (1984) 1-9-point scale wherein 1 = highly natural and 9 = highly unnatural and gradations in between are judged accordingly. Typically, ratings between 1-3 are considered within the normal range, with "3" indicating a marginally normal ratings. If the speech sample being rated is relatively short, one naturalness rating made at the end of the completed sample may be adequate. More often, naturalness

ratings are made periodically during an ongoing speech sample; the longer the sample, the more appropriate it is to make several naturalness ratings throughout. A given naturalness rating reflects the rater's perception of how natural-sounding was the speech of the *preceding interval*, that is, the period of speech occurring since the last naturalness rating.

Rating Period. The length of the rating interval is selected by typing in a number (in seconds) in the Rating Period box. (We often use 15, 30 or 60 seconds). The length of the previously selected Run Length must be evenly divisible by the length of the Rating Period (e.g., Run Length = 18- seconds: Naturalness Rating Period could be 10, 15, 20, 60 seconds, etc., but not 25 or 50, etc.). When sample length is determined by Syllable Count, the selected Naturalness Rating Period must be a whole number divisor of 30 minutes (again, we typically use 15, 30 or 60 seconds). In these cases it is likely that the sample will end before the last naturalness rating period has been completed. Syllables and stutters counted in that period will be included in the data, but the naturalness rating that would have occurred in that period will be ignored in the data summary.

Tone Prompt. The SMS program presents a visual signal 5 seconds in duration on the screen (NA) to indicate to the observer when to make a naturalness rating. The program does not record any syllables or stutters until a naturalness rating is registered. If the naturalness rating period is exceeded, data collection for the entire run is cancelled. When the Tone Prompt option is ticked, the SMS provides an additional auditory cue (a tone) to the listener to signal the beginning of the Naturalness Rating period. This is especially helpful in circumstances where the listener is watching the speaker (as opposed to listening to a speech sample on audio tape and concurrently watching the SMS screen), although it can be distracting to the speaker if SMS data are being acquired *in vivo*.

Periodic Display Parameters. If periodic display (rather than continuous or no display) of Syllable Counts, Stutter Event Counts, Stuttered Interval Counts and/or Naturalness Ratings are desired, Periodic Display Parameters must be indicated.

Update Period. Type into this box how often (in seconds) you wish to have these cumulative counts displayed. This number must be equal to, or a multiple of, the selected Naturalness Rating Period.

Display Duration. Type into this box the length of time (in seconds) you wish to have the periodic updates displayed. This number must be less than the duration of the Update Period.

Use Intervals. All stutter frequency data are counted and recorded by the SMS on an event-by-event basis. In addition, the SMS offers the option of reporting stuttering frequency in terms of the number and percent of overlaid time intervals that contain stuttering. This option offers at least two advantages. First, it has been shown that higher levels on interobserver agreement can be obtained when observers are compared regarding the number of intervals of speech that are judged to contain (and not contain)

stuttering than when those observers' stuttering counts are compared (Cordes, Ingham, Frank, & Ingham, 1992). Second, intervals of speech that do not contain stuttering can be identified so that stutter-free speech rate, SFSPM (sometimes referred to as *articulatory rate*) can be estimated (if stutter-free intervals exist in the sample) (see below). When SFSPM data are desired and therefore interval analyses are used, Pause Control should also be activated so as to assure that all stutter-free intervals actually contain speech throughout. The user is free to select any interval duration as long as this number can be evenly divided into the selected Run Length. (If sample length is determined by syllable counts (Syllable Mode), the interval duration must be a whole number divisor of 30 minutes.) In general, the smaller the interval the better in terms of producing findings that are able to reflect even small changes in stuttering frequency. Cordes et al. found that intervals of 3 to 5 seconds were the smallest that were consistent with high interobserver agreement.

TO START THE PROGRAM: After all the desired options have been selected, click "OK" (or press Return). The data collection screen will appear and the program will begin when any key on the keyboard is pressed. Therefore, press a 'start' key just as the speech sample to be analyzed begins.

At the completion of a run, the summary data will automatically appear on the screen. At the same time, in the upper right corner a dialogue box will appear that allows the user to "Make another run with the same settings" (the default selection), "Make another run with new settings", or "Return to Main Menu." If "Make another run with new settings" is selected (by clicking in the circle or moving the marker to the appropriate circle key by touching the down arrow on the keyboard (↓) and pressing "OK"), the Run Configuration screen appears and changes can be made in preparation for the next run to be scored. If "Return to Main Menu" is selected, the first screen reappears. Then the user may add or delete a subject, select another subject, browse the data files, print data files, or shut down the program by clicking on the "x" in the top right corner of the screen.

At any time during data collection, pressing Esc will end a run. When this occurs, the above-described dialog box will appear, also giving the user the option to save or delete the data collected during the partial run.

THE SMS EFFICACY DATA

The data displayed at the end of each run are the same data that are stored in the speaker's name under BROWSE on the first screen of the SMS. A variety of calculations is available, depending upon the options selected from the Run Configuration screen before data collection for a given speech sample. All of the options and calculations are described below.

SYL. Data report under this heading represent the total number of syllables (nonstuttered + stuttered) counted by the user during a given speech sample. More specifically, SYL reports the number of right + left mouse button presses that occurred from the beginning to the end of the run.

STUT. Data reported under this heading represent the total number of stutters (stutter events/right mouse button presses) signaled by the user during the run.

SI. If Interval analysis has been selected, data reported under this heading represent the total number of intervals in the speech sample that contained at least one stutter. The computer overlays a template of intervals of the preselected duration (say, 5 seconds) across the full duration of the speech sample and calculates the number of those intervals during which one or more right mouse button presses was recorded. SI, then, provides a general estimate of frequency of stuttering in the sample.

SPM. Data reported under this heading represent the average number of syllables (nonstuttered + stuttered) spoken per minute during the speech sample, sometimes referred to as *overall speaking rate* (Costello & Ingham, 1984; Ingham, 1999; Ingham & Riley, 1998; Perkins, 1975). The Computer uses the formula: number of syllables counted ÷ accumulated time on the clock, to 0.1 minute. To provide a relatively accurate indication of speed of speech, SPM data should be obtained with the Pause Control “on” so that the denominator in this formula represents the speaker’s actual talking time, excluding pauses of significant length.

SFSPM. Data reported under this heading represent the average number of syllables spoken during all stutter-free intervals of speech. Therefore, this number estimates the speaker’s *articulatory rate* (Costello & Ingham, 1984; Ingham, 1999; Ingham & Riley, 1998; Perkins, 1975), uninfluenced by time spent stuttering, and therefore contributes a different dimension of speech rate than overall SPM. The computer uses the formula: number of syllables spoken across all stutter-free intervals ÷ cumulative total time of all stutter-free intervals. In the SMS, the calculation of SFSPM requires the user to have preselected Interval recording and Pause Control so that the denominator excludes pause time where no speech was occurring. One drawback to the calculation of SFSPM is that for some people who stutter, few or no stutter-free intervals exist, thereby obviating the value of this measure.

%SS. This measure, the percent of syllables spoken that is stuttered, is the fundamental indicator of the frequency of stuttering in a sample. The computer uses the formula: number of stutters counted ÷ total number of syllables spoken (nonstuttered + stuttered). In other words, the number of right mouse button presses ÷ the number of right + left mouse button presses.

%SI. If the user has preselected Interval recording, the computer can calculate the percent of intervals that contained stuttering. The formula: number of intervals containing at least one right button press/stutter ÷ total number of intervals in the sample. For example, if the sample is 3 minutes in length and 5-second intervals are used, the computer would separate the sample into 36 5-second intervals (12, 5-sec intervals per each minute) and note the number of those intervals that contained at least one stutter, say 12. In this case, the percent of intervals stuttered (%SI) would be $12 \div 36 = 33\%$.

NAT. Data reported under this heading represent the average of all the naturalness ratings made during the sample. For example, if the sample is 3 minutes in length and the Naturalness Rating Period is 15 seconds, 12 ratings would have been made, one every 15 seconds. Assume the ratings were as follows: 5,7,6,5,6,4,5,5,6,5,5,5. The computer would sum these ratings and divide by the total number of ratings made ($64 \div 12 = 5.3$).

This completes the summary of the data recording and analysis calculations available in the Stuttering Measurement System. Questions and comments may be sent to Janis Costello Ingham via email at jingham@speech.ucsb.edu.