

MANUAL FOR THE ADMINISTRATION AND SCORING OF THE MODIFIED MINI-MENTAL STATE (3MS) TEST

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Introduction

Main differences between the 3MS and the MMSE

The Modified Mini-Mental State (3MS) test has been designed to enhance the usefulness of the popular Mini-Mental State Examination (MMSE) (Folstein, Folstein, and McHugh, 1975). Compared with the MMSE, the 3MS has more standardized administration and more graded scoring; it also assesses a broader variety of cognitive domains and covers a wider range of difficulty levels. The 3MS can extract more information about the subject's cognitive status than the MMSE; it is also more sensitive than the MMSE in detecting within-individual changes over time (Teng and Chui, 1987).

The 3MS is not just a screening test for dementia

Neither the MMSE nor the 3MS has been designed primarily as a screening tool for dementia. For this purpose the 3MS Test is only marginally better than the MMSE (Tombaugh, McDowell, Kristjansson, and Hubley, 1996); as a matter of fact, comparable screening efficacy can be achieved with the use of a much shorter test, a short version of the Cognitive Abilities Screening Instrument, or CASI-Short (Teng, Hasegawa, Homma, et al., 1994). Although many of the items in the MMSE and the 3MS are not sensitive for detecting dementia in its early stage, they are useful for other purposes, including that of monitoring the progression of dementia to its middle and late stages.

This Manual contains answers to many frequently asked questions

This manual has been prepared after more extensive use of the 3MS by us and others since the first article on the 3MS was published (Teng and Chui, 1987). In this manual we have incorporated answers to many questions that frequently arise during the administration and scoring of the 3MS. Minor changes have been made from the original article. For example: the order of asking the time and place of birth has been switched; the three choices for spatial orientation have been modified. Wherever information provided in this manual differs from that in the original article, follow this manual.

The availability of quizzes on 3MS administration and scoring

When the 3MS is used in a research setting where data will be collected and used by different individuals, it will be cost effective to make sure that all users follow the same administration and scoring guides. We have learned that providing a manual and conducting a workshop is no guarantee for achieving this goal. Therefore we have prepared two parallel forms of a quiz as an aid for quality control. Each quiz contains 24 items with four response choices each. We recommend that each potential user of the 3MS first read the original article (Teng and Chui, 1987) and study this manual, then take the quiz. We have used an arbitrary guideline that, if a person has made more than three errors on the quiz, he or she be asked to study the manual more carefully and then take an alternate form of the quiz. This procedure should be repeated until or unless the number of errors is less than four; in such case the correct answer(s) on the missed item(s) will be provided, and the individual is considered ready for formal data collection.

The quizzes and their scoring keys should be kept separate from the Manual and guarded as confidential material. We recommend that the quizzes be administered in an office setting and all quiz booklets be collected along with the answer sheets.

Comments and suggestions are welcome

We plan to update this Manual periodically. If you have any comments or suggestions for its improvement, please let us know.

Some References

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General Considerations

Examiners should thoroughly familiarize themselves with the testing procedures and the scoring criteria before using the 3MS Test in formal assessment. The 3MS record sheet contains highly condensed information from this manual. Users of the record sheet must first study this manual carefully, otherwise misunderstandings of the condensed information on the record sheet can easily occur.

In the administration of the 3MS Test, **do not offer extra help or wait too long for responses.** Although sometimes it is appropriate to re-present or rephrase a question, in general if a subject gives an incorrect answer, says "I don't know," or is unable to give an answer, the examiner should just score accordingly and proceed to the next item.

Although time limits are set for some items, they are stated in the Manual and on the record sheet only for guiding the examiners in the pacing of the administration and in scoring. **Subjects should never be told of any time limit on any item.**

The 3MS should be administered in a quiet place with minimal distractions. If any temporary condition exists that may detract the subject from his or her optimal performance, such should be noted on the record sheet and in the test report. Other factors that might alter the interpretation of the test score as an indication of cerebral cognitive abilities should also be noted; examples include poor hearing, poor eyesight, impaired motor control, language barrier.

ADMINISTRATION AND SCORING OF THE INDIVIDUAL ITEMS**PLACE AND DATE OF BIRTH**

Place: town _____, state _____

Date: year _____, month _____, day _____

This item is a measure of long-term memory. It is assumed that in the past the subject has had repeated opportunities to learn and report his/her date and place of birth.

First ask "**WHERE WERE YOU BORN?**", then ask "**WHEN WERE YOU BORN?**" If the subject gives only part of the answer (e.g., only the year of birth to the second question), ask for the missing information.

Scoring

One point for each entry. Obtain data from a reliable source as a scoring guide. In case there is no independent source of information, accept the subject's answer to be correct if (i) it is given promptly with confidence, (ii) it seems reasonable, and (iii) the subject's performance on the other test items are generally good. When in doubt, repeat the questions at the end of the test. For each component, if the subject's answers on the two occasions are consistent, score 1; otherwise, score 0. (The assumption is that if the subject does not remember and gives a guessing answer, it is unlikely that the two guesses will be identical.)

REGISTRATION # _____: (No. Presentations: _____)

#1: SHIRT _____, BROWN _____, HONESTY _____
#2: SHOES _____, BLUE _____, MODESTY _____
#3: SOCKS _____, BLACK _____, CHARITY _____

Tell the subject: "**I AM GOING TO SAY THREE WORDS FOR YOU TO REMEMBER. REPEAT THEM AFTER I HAVE SAID ALL THREE.**"

(Note: The subject is NOT told that "I am going to ask you to recall the three words later." Such an instruction may encourage rehearsal and make the general performance level of later recalls too high.)

Consider using different versions of three words (i) for consecutive subjects and (ii) when the same subject is tested repeatedly.

Record the version number in "# ____:" Circle the presented words in the two recall items on the record sheet; this will help make the administration and scoring of these two later items easier.

Say the three words distinctly at the rate of 1.5 sec. per word.

If the subject repeats after each word, request repetition of all three items at the end of your presentation ("**Tell me the three words again**") and score according to the responses to this request.

Some subjects will interrupt (typically with a question, e.g., "What is the first word?") during the presentation of the three words. Do not stop to respond. Continue to finish the presentation of the three words, then ask: "What three words do you think I have just said?" Score according to the answer to this question.

If the subject cannot repeat all three words correctly, re-present all three words, up to three times. Then, whether or not the subject can repeat all three words, proceed to the next item.

During the first re-presentation of the three words, it is advisable to clarify the words to help understanding. For example: "Let me say the three words again. They are...SHIRT -- what you are wearing, BROWN -- a color, and HONESTY -- to be truthful; telling the truth. Now say the three words again.")

Enter the total number of presentations given in "(No. Presentations: ____)" (The maximum number is 4.)

Scoring

The score for registration is the number of items correctly reported in whatever order after the first presentation. Accept minor variations from the presented word (e.g., sock for socks, honestly for honesty) as correct.

MENTAL REVERSAL

5 to 1 (Can ____ Can't ____ do 1 to 5)

Accurate	2
1 or 2 errors/misses	1
More than 2 errors/misses	0

DLROW (Can ____ Can't ____ do forward)

0 1 2 3 4 5

This item has two parts: counting backwards from 5 to 1, and spelling WORLD backwards. For each part, ask the subject to do the forward version first, coach once if needed.

First say: **"COUNT FROM 1 TO 5."** If the subject can do this, check "Can ____", otherwise check "Can't ____".

If the subject can count from 1 to 5, say **"NOW COUNT BACKWARDS FROM 5 TO 1."**

If the subject cannot count from 1 to 5, coach and ask the subject to repeat: Say **"SAY 'ONE, TWO, THREE, FOUR, FIVE'"** at the rate of 1.5 sec per digit. Coach only once, then ask the subject to count backwards from 5 to 1, even if the performance in counting forward is not perfect.

Score 2, 1, or 0 according to the stated criteria on the record form.

Next say: **"SPELL 'WORLD'."** Check the appropriate blank on the record form to indicate whether or not the subject can spell WORLD forward correctly. If not, coach once and ask the subject to repeat. Say **"IT'S SPELLED W-O-R-L-D."** If the subject does not repeat spontaneously, prompt with **"Say 'W-O-R-L-D'."** Pronounce the letters distinctly at the rate of 1.5 sec per letter. Whether or not the subject spells correctly after coaching, next say:

"NOW SPELL 'WORLD' BACKWARDS."

Score from 0 to 5, according to the following rules:

1) Write down the subject's response; read backwards and record the highest number of letters that are in correct relative order for WORLD. For example:

4 point responses: DLORW, DLWRO, DLDRW, DROW, DLOW, DRLOW.

3 point responses: DORW, DOLW, DORLW, DRLW.

2 point responses: DOR, DL, DW.

2) Give credit for the subject's self-corrections.
E.g., if the subject says "D-R-L-O-W .. No! D-L-R-O-W," the score is 5.

3) If the subject says only one letter, score 1 if it is D, score 0 otherwise.

4) Subtract one point if there are more than five letters.

For example:

LDDLRO = 4 (for DLRO) - 1 = 3

LDOROL = 3 (for DRO) - 1 = 2

5) If the subject repeats W-O-R-L-D or part of it in the forward direction, score 0.

6) The lowest score is 0; do not give negative scores.
For example, if the subject says "W-W-O-R-L-D", the score is 0 instead of { [0 (rule #5) - 1 (rule #4)] = } -1.

FIRST RECALL OF THREE WORDS

Spontaneous recall	3
After "Something to wear"	2
After "SHOES, SHIRT, SOCKS"	1
Still incorrect	0
Spontaneous recall	3
After "A color"	2
After "BLUE, BLACK, BROWN"	1
Still incorrect	0

Spontaneous recall	3
After "A good personal quality"	2
After "HONESTY, CHARITY, MODESTY"	1
Still incorrect	0

Ask **"WHAT THREE WORDS DID I ASK YOU TO REMEMBER EARLIER?"**

For each word not readily reported, provide category cuing, followed by multiple choices if necessary. Do not wait more than **3 sec.** for spontaneous recall, and do not wait more than **2 sec.** after category cuing, before providing the next level of help.

If the subject starts out giving an incorrect answer in the correct category (e.g., reports "shirt" or "coat" when the correct answer is "shoes"), proceed to provide the three alternatives for him or her to choose from, and score 1 if the choice is correct. If after given three choices the subject indicates that he or she still does not remember, score 0. Do NOT press for a guessing answer.

If the subject has not chosen the correct answer from the three choices, score 0 but do tell him or her the correct answer. This is for the benefit of the second recall to be requested later.

Whenever a subject has not reported all three words correctly without help (i.e., whenever the total score on first recall is < 9), say the three words once more before proceeding to the next item. However, subjects are NOT told that they will be asked to recall the three words again.

Example: (Assuming that the three words presented by the examiner are Shoes, Black, Modesty).

Examiner: "What three words did I ask you to remember earlier?"

Subject: "Shoe...." (3 sec. pause)

E: "Another word is a color." S: "Black!"

E: "That's right. Another word is a good personal quality."

Season	Accurate or within 1 mo.	1
	Missed by > 1 mo.	0

Ask **"WHAT IS TODAY'S DATE?"** and probe for items not reported.
(e.g., "What year is this?")

For the season, do not accept "Christmas season," "rainy season," or similar responses. If the subject appears puzzled or gives an answer that is not one of the four seasons, provide the names of the four seasons for the subject to choose from and put the correct choice in the second position.

Scoring

Answers for year, month, and date of month are scored in a graded manner according to the closeness of the response to the correct answer. Follow the criteria listed above. For each sub-item, if the subject cannot answer, score 0.

For Season (SSN): Give 1 point if the answer is correct or if the change of the season occurred (or will occur) within 30 days and the subject reports the last (or next) season.

The seasons change around the 21st of March, June, September and December.

Example:

The correct date is March 3, 1991.
The subject reports Feb. 28, 1975.

Score for YR: 0. (1975 is more than 5 yrs. from 1991.)

Score for MO: 2. (February 28 is less than 5 days from March.)

Score for DATE: 1. (February 28 is within 3-5 days of March 3.)

SPATIAL ORIENTATION

State	0	2
County	0	1
City	0	1
Store/Hospital(Clinic)/ Home?	0	1

Ask "WHAT ____ ARE WE IN?"

For the last sub-item, ask "ARE WE IN A STORE, A HOSPITAL (/MEDICAL CLINIC), OR A HOME?" *

Present the correct choice in the middle. For example, when testing at a subject's home, ask "Are we in a store, a home, or a hospital?" If the correct answer (e.g., a senior-citizens' activity center) is not among the three alternatives given above, use it to replace the middle choice.

* A change has been made from the published paper, where the three choices are hospital, office building, and home. In many clinical settings the answer of either "hospital" or "office building" would be correct. The current three choices reduce the probability of being correct by chance.

Score according to the criteria listed above.

NAMING

For MMSE: Pencil ____, Watch ____

For 3MS: Forehead ____, Chin ____, Shoulder ____,
Elbow ____, knuckle ____

This item tests whether or not the subject can promptly name the two objects and the five body parts. If the subject cannot name within 2 sec, or if the answer is incorrect, do not help or question again; just score 0 and move on to the next part.

For the MMSE sub-items, the examiner picks up a pencil

and asks "WHAT IS THIS?", and then points to a watch and asks "WHAT IS THIS?"

For the 3MS Test sub-items, the examiner asks while pointing to the appropriate part on his or her own body: "WHAT DO YOU CALL THIS PART OF THE FACE? (pointing to the middle of the forehead) ... AND THIS PART? (pointing to the chin) .. AND THIS PART OF THE BODY? (pointing to the shoulder) ... AND THIS PART? (pointing to the elbow)... AND THIS PART OF THE HAND? (pointing to the knuckle)"

Score 1 point for each item named correctly **within 2 sec.**

FOUR-LEGGED ANIMALS (30 sec)

Ask "WHAT ANIMALS HAVE FOUR-LEGS? TELL ME AS MANY AS YOU CAN."

Start timing at the end of this request.

If the subject says "All animals have four legs," say "Tell me their names" but do NOT re-start the timing.

The first time an incorrect answer is provided, gently remind "I want four-legged animals." Do not correct for subsequent errors.

Discontinue after 30 sec. or after 10 correct responses, whichever occurs first.

If the subject gives no response in 10 sec. and there are still at least 10 sec. of remaining time, gently remind (once only): "What (other) animals have four legs?"

Score one point for each correct animal name. Different names for the same animal of different ages or genders count as one. (E.g., kitten and cat, puppy and dog, deer and doe.) Accept marginal cases such as monkeys, chimpanzees, baboons, and kangaroos as correct responses.

SIMILARITIES

ARM-LEG

Body part, limb, extremities	2
Long, bend, muscles, bones, etc.	1
Incorrect; DK; tells difference	0

LAUGHING-CRYING

Expressions of <u>feelings/emotions</u>	2
Other correct answer	1
Incorrect; DK; tells difference	0

EATING-SLEEPING

<u>Necessary</u> bodily functions	2
Other correct answer	1
Incorrect; DK; tells difference	0

Introduce this item by saying:

"AN APPLE AND A BANANA ARE ALIKE IN THAT THEY ARE BOTH FRUIT."

Emphasize the words "alike" and "both." Pause for 2 sec. for the subject to process this statement, then ask:

"IN WHAT WAY ARE ____ AND ____ ALIKE?" or:

"__ AND __ ARE BOTH.....?"

For the first sub-item (arm and leg) only: If the subject's answer is less than 2 points, coach for a 2-point answer.

For the next two sub-items: No coaching. If the subject gives an incorrect similarity, or tells the difference, or says "They are different" or "I don't know," just score 0 and move on.

Scoring

Score 2 points for conceptual similarities which are primarily pertinent for both members of the pair. Score 1 point for other answers that are correct. In general, be lenient in awarding 1 point; subjects are given credit as long as they can see beyond the differences and come up with a reasonable answer. Examples:

Arm-Leg:

2 points: limbs, extremities, parts of body

1 point: bend, move, long, have bones

0 point: useful (Comment: too vague.)

Laughing-Crying:

2 points: (expressions of) emotions, feelings

1 point: expressions, sounds, involve the mouth

0 point: produce tears (Comment: laughing usually
Does not produce tears);

sometimes you laugh when you cry, sometimes
you cry when you laugh (Comment: this
statement is not about their similarity,
but about their relationship).

Eating-Sleeping:

2 points: necessary bodily functions; essential for
life

1 point: bodily functions, relaxing, "good for you,"
refreshing, enjoyable, daily activities,
"I like both."

0 point: I don't know (DK)

REPETITION

"HE WOULD LIKE TO GO HOME."	2
One or 2 missed or wrong words	1
More than 2 missed or wrong words	0

"NO IFS ____ ANDS ____ OR BUTS ____"

The intended function of this item is to assess attention and the ability to repeat orally presented verbal messages. The two sub-items respectively require a low and a high level of attention for correct response.

Tell the subject: "**REPEAT EXACTLY WHAT I SAY -- 'HE WOULD LIKE TO GO HOME.'**" After the response, say "**NOW REPEAT -- 'NO IFS, ANDS, OR BUTS.'**" Speak distinctly, but not particularly slowly.

Scoring

First sub-item: 2 points for perfect repetition.
1 point if there is 1 or 2 missed or wrong words.

Second sub-item: For each of the three parts (no ifs; ands; or buts), 1 point for perfect repetition. Give no credit if the "s" is missed.)

READ AND OBEY "CLOSE YOUR EYES."

Closes the eyes without prompting	3
Closes the eyes after prompting	2
Reads aloud the command, either spontaneously or after prompting, but does not close the eyes	1
Neither reads correctly, nor closes the eyes	0

The command is printed in all capital letters, approximately 2.5 cm in height, within the top one third of the back-side of the record form.

Fold the sheet of paper one-third down to show the command and say "**PLEASE DO THIS.**" Keep the paper close to the surface of the table so that there is not enough lighting from behind to show the words on the front side of the recording sheet.

If the subject does not respond, or merely reads the command, point to the command and say "**DO WHAT THIS SAYS.**" Allow up to 5 sec. for response, then move on to the next item. As soon as the subject closes the eyes, say: "Thanks. You can open your eyes now."

Score according to the criteria stated above.

WRITING (1 minute)

HE WOULD LIKE TO GO HOME.

Fold the sheet of paper once more to show the blank, middle one-third of the sheet. Tell the subject:

"**I WOULD LIKE TO HAVE A SAMPLE OF YOUR HANDWRITING.
WRITE 'HE WOULD LIKE TO GO HOME.'**"

Allow either cursive or printing. If the subject seems to have trouble remembering the sentence, dictate the sentence word by word as the subject writes.

Allow up to one minute for response, then move on to the next item. If at the end of one minute the subject is still working on the task in earnest, consider allowing him/her to finish for the sake of maintaining rapport and morale, but mark the 1 min. point on the product during scoring, and do not credit parts finished after 1 min.

Scoring

One point for each word, but do not score the first word "I/He". Score each word according to whether or not it can be readily identified without the context. For each word, score 0 if there is spelling error or incorrect mixed capitalization (e.g., I would Like to Go homE). Do not penalize if the subject prints all letters in the uppercase.

COPYING INTERSECTING PENTAGONS (1 minute)

	Each Pentagon:	
5 approx. equal sides	4	4
5 but un-equal (>2:1) sides	3	3
Other enclosed figure	2	2
2 or more lines	1	1
Less than 2 lines	0	0

	Intersection:
4-cornered enclosure	2
Not 4-cornered enclosure	1
No enclosure	0

Show only the lower one third of the sheet that contains the sample pentagons. For right-handed subjects, present the sample on their left side. For left-handed subjects, present the sample on their right side. This way the sample will not be blocked by the drawing hand.

Allow up to one minute for response, then move on to the next item. If at the end of one minute the subject is still working on the task in earnest, consider allowing him or her to finish for the sake of maintaining rapport and morale. Do mark the 1 min. point on the product during scoring, and do not credit parts finished after 1 min.

Sometimes the subject is not satisfied with the product and wants to try again. This is permitted, but do not re-start the timing. Score for the better product completed within one minute.

Score according to the criteria listed above.

THREE-STAGE COMMAND

____ TAKE THIS PAPER WITH YOUR L (R) HAND,
____ FOLD IT IN HALF, AND
____ HAND IT BACK TO ME.

This item tests the subject's ability in understanding, remembering, and executing a three-part command. The three parts of the command are spoken clearly in approximately 6 sec., without interruption, and are given only once. If the subject interrupts with "What did you say?" or the like, do NOT stop to respond; continue to finish the command, then say: "Do what you think I asked you to do."

Use a blank piece of paper for this test.

The first stage of the command asks the subject to take the pieces of paper with his or her **NON**-preferred hand (the hand not used in the preceding writing and drawing tasks).

The examiner holds the piece of paper in plain view of the subject while giving the command. Some subjects tend to reach for the paper immediately after hearing the first part. When this happens, the examiner should temporarily move his or her hand away from the subject to keep the paper out of reach while continuing to state the next two parts of the command without interruption.

After saying the command, the examiner should take care not to move the paper towards the subject before he or she reaches for it; this is to avoid providing non-verbal cues for the subject to take the paper.

Some subjects attempt to fold the paper with one hand. Do not disrupt if you think the subject can accomplish the task despite some clumsiness. If the subject is having considerable difficulty, say "You can use both hands now."

After the subject has taken (and folded) the piece of paper, the examiner should take care not move his or her hand towards the subject in a gesture to receive the paper until the subject has started to hand the paper back.

Again this is to avoid giving nonverbal cues.

Do not repeat any part of the command. If the subject requests the examiner to do so, say "SORRY, I CANNOT REPEAT. JUST DO WHAT YOU THINK I ASKED YOU TO DO." If the circumstances are such that it is desirable to oblige for the sake of maintaining a fragile rapport, score according to the response(s) executed before the repeat presentation of the command.

Scoring

One point for each part of the command.

First part: Score 0 if the subject uses the preferred hand.

Second part: Score 0 if the subject folds the paper more than once.

Third part: Score 0 if the subject simply puts the paper down instead of handing it back to the examiner.

The subject may fold the paper with both hands, and may hand back the paper with either hand.

SECOND RECALL OF THREE WORDS

(Clothing: SHOES/SHIRT/SOCKS)	0	1	2	3
(Color: BLUE/BLACK/BROWN)	0	1	2	3
(Virtue: HONESTY/CHARITY/MODESTY)	0	1	2	3

Always administer this item, even if the subject has scored 0 on First Recall.

Ask "WHAT THREE WORDS DID I ASK YOU TO REMEMBER EARLIER?"

Follow the same testing and scoring procedure as for First Recall, except that at the end do not coach for the correct three words even when the score is not perfect.