Manual for the Motor Imitation Scale (MIS)
Revised August 2015

The Motor Imitation Scale (MIS) was developed as a research tool to assess motor imitation skills in young children with ASD. It consists of 16 single-step actions that are modeled by an adult within a structured interaction. Half of the items require imitation of actions with objects, and the other half require imitation of body movements. The object actions are further divided into those involving "meaningful" vs "non-meaningful" actions. See **Figure 1** for a photo of the materials used in the MIS.

The MIS was originally published in the following article:

> Stone, W. L., Ousley, O. Y., & Littleford, C. L. (1997). Motor imitation in young children with autism: What's the object? Journal of Abnormal Child Psychology, 25, 475-485.

This manual contains information about the MIS items, administration, and scoring procedures. It can be downloaded from the University of Washington READI Lab website: http://uwreadilab.com/ (located under the "Tips and Resources" tab).

Fig. 1. Materials used in the MIS

MIS Items

Table 1 lists the 16 MIS items, along with the type of action they represent. The items <u>do not</u> need to be presented in the order they appear below and on the MIS Score Sheet (page 8). The sequence was initially conceived so that developmentally simpler actions could be presented first, and those requiring imitation of fine motor actions and imitation of "invisible" actions (i.e., those the child cannot see himself do) could be presented later in the assessment.

Table 1. MIS items and categories

Item	Type of action*
1. Bang spoon on table	Object; Non-meaningful
2. Shake rattle	Object; Meaningful
3. Clap hands	Body
4. Wave hand	Body
5. Push car across tabletop	Object; Meaningful
6. Push teacup across tabletop	Object; Non-meaningful
7. Walk toy dog across tabletop	Object; Meaningful
8. Walk hairbrush across tabletop	Object; Non-meaningful
9. Bend index finger up and down	Body
10. Scratch tabletop with fingers	Body
11. Open and close fist	Body
12. Drum with hands on tabletop	Body
13. Pull on earlobe	Body
14. Pat cheek	Body
15. Place small block on head	Object; Non-meaningful
16. Hold string of play beads behind neck	Object; Meaningful

> *** Note:** *"Meaningful" object actions are those that are consistent with the natural use of the object, and "Non-meaningful" actions are those that are less likely to be associated with the object.*

MIS Administration Guidelines

1. The MIS should be presented in a playful, game-like style. We suggest keeping the materials in a colorful bag, and making a game out of pulling the objects out of the bag.

2. We usually try to administer the MIS at a table. Make sure that the work table is free from distracting items and that the child's hands are free. Remove the items from the previous MIS task before proceeding to the next. If you present items on the floor, it is best to demonstrate the actions on a well-defined space, such as on a mat or on the seat of a small chair.

3. Obtain the child's attention before demonstrating each action. Instructions such as "[Child's name], look at what I'm doing!" or "Look at me!" may be helpful in eliciting attention. Do not label the action, as that will make it difficult to determine whether the child is imitating your action or following your verbal cues. After the demonstration, say to the child, "Now you do it!" or "Your turn!" and place the material on the table in front of him or her.

4. We strongly recommend that you use non-descriptive sounds as you demonstrate each item, to increase children's interest and attention. We use sounds such as "bop-bop-bop" or "whee-whee-whee" and present them in rhythm as we model the action. However, it is critical that the sounds do not match the content of the action (e.g., do not make a motor sound while pushing the car, or say "shake-shake-shake" while shaking the rattle).

5. Three trials for each item are permitted. Each trial is scored Pass, Emerge, or Fail, which correspond to scores of 2, 1, or 0, respectively. Only the child's motoric response is scored; imitation of the vocalization does not earn credit. The child's best response for each item is scored and summed to obtain the total score, which can range from 0-32.

6. Items can be presented in any order. It may be helpful to begin with some of the object items, as they tend to be less difficult for some children.

7. Only immediate imitation responses are scored. Imitation of a previous action that occurs after presentation of the next item is not given credit.

MIS Scoring Guidelines

For each item, a score of 2 (Pass) reflects a complete imitation, a score of 1 (Emerge) reflects a partial imitation or an attempt but unsuccessful similar action, and a score of 0 (Fail) reflects no imitation. Examples of scores for each item are presented below. Note that the term "purposefully" is used to differentiate intentional actions (which receive credit) from accidental actions (which do not).

1. **Bang spoon on table**

   2 = purposefully bangs spoon on table one or more times as demonstrated
   1 = purposefully shakes spoon up and down without touching it to the table
   0 = none of the above; may put spoon into mouth

2. **Shake rattle**

   2 = purposefully shakes rattle back and forth at least once to make "rattle" noise
   1 = purposefully bangs rattle on the table
   0 = none of the above; may put rattle in mouth

3. **Clap hands**

   2 = purposefully puts hands together to clap at least once
   1 = purposefully puts hands together but does not clap (e.g., puts hands together but
       does not move them apart), OR manipulates examiner's hand to clap
   0 = none of the above; may bang hands on table

4. **Wave hand**

   2 = purposefully waves hand as demonstrated, with at least one complete wave
   1 = purposefully moves hand in a way other than that demonstrated, OR manipulates
        examiner's hand to wave
   0 = none of the above; may bang hand on table

5. **Push car across the tabletop**

   2 = purposefully uses hand to push car across tabletop with some lateral movement, as
       demonstrated
   1 = purposefully gives car a push or flicks it so it rolls off the table
   0 = none of the above; may examine wheels of car

6. **Push teacup (upright) across the tabletop**

   2 = purposefully uses hand to slide upright cup across tabletop with some lateral
       movement, as demonstrated
   1 = purposefully flicks cup across tabletop OR pushes it across table on its side or
        upside down
   0 = none of the above; may hold teacup to mouth as if drinking

7.   Hop toy dog across tabletop

    2 = purposefully "hops" toy dog across tabletop with some lateral movement, as
        demonstrated

    1 = purposefully "hops" toy dog in place (i.e., no lateral movement), OR flicks dog across
        table

    0 = none of the above; may examine or mouth the dog

8.   Hop hairbrush (on end) across the tabletop

    2 = purposefully "hops" brush on end across tabletop with some lateral movement, as
        demonstrated

    1 = purposefully "hops" brush in place (i.e., no lateral movement), OR slides brush across
        table on its side

    0 = none of the above; may hold brush up to hair

9.   Bend index finger up and down

    2 = purposefully isolates one or two fingers and attempts an up and down motion
        with at least one finger

    1 = purposefully moves hand up and down without isolating finger(s) as
        above, OR manipulates examiner's finger to bend

    0 = none of the above

10.   Scratch tabletop with fingers (both hands)

    2 = purposefully uses both hands in "scratching" motion as demonstrated

    1 = purposefully uses one hand in "scratching" motion, OR moves both hands on table
        using a different action

    0 = none of the above

11.   Open and close fist (one hand)

    2 = purposefully makes a fist and opens it at least once

    1 = purposefully closes fist but does not open it, OR manipulates examiner's hand to
        open and close fist

    0 = none of the above

12.   Drum with hands on tabletop

    2 = purposefully "drums" on table, with both hands hitting the table at least twice

    1 = purposefully "drums" with one hand, OR "drums" with both hands hitting the table
        only once

    0 = none of the above

13.   **Pull on earlobe**

    2 = purposefully brings hand to touch ear and grasps lobe (pulling motion may not be evident)

    1 = purposefully touches another part of head, OR puts finger in ear, OR pulls on examiner's ear

    0 = none of the above

14.   **Pat cheek**

    2 = purposefully brings hand to touch cheek (patting motion may not be evident)

    1 = purposefully pats another part of head OR pats examiner's cheek

    0 = none of the above

15.   **Place small block on head**

    2 = purposefully places block on own head using one or both hands (block does not need to remain on head)

    1 = purposefully lifts block and places it on another part of body, OR puts it on examiner's head

    0 = none of the above

16.   **Hold string of play beads behind neck**

    2 = purposefully holds strand of beads around neck, with the ends of both strands held behind the neck

    1 = purposefully lifts strand of beads up to neck, holding ends of both strands in front of (or at) shoulders, OR drapes strand of beads around the back of the neck, with or without holding the ends of the strands in front

    0 = none of the above

MIS Score Sheet

ID: _____   Date: _____   Examiner: _____   Total score: _____

Item	Trial 1	Trial 2	Trial 3	Best Score	Notes
1. Bang spoon on table					
2. Shake rattle					
3. Clap hands					
4. Wave hand					
5. Push car across tabletop					
6. Push upright teacup across tabletop					
7. Hop toy dog across tabletop					
8. Hop hairbrush on end across tabletop					
9. Bend index finger up and down					
10. Scratch tabletop with fingers of both hands					
11. Open and close fist					
12. Drum with hands on tabletop					
13. Pull on earlobe					
14. Pat cheek					
15. Place small block on head					
16. Hold string of play beads behind neck					

Score: 2=Pass   1=Emerge   0=Fail