

Means-End Problem-Solving Assessment Tool (MEPSAT)

ID: _____ Assessment Date: _____ Evaluator's name: _____

Testing Condition (e.g., time, room, support, assistance, others present):

Summary of the Task:

Means-end Towel Task: the goal of the means-end towel task is to evaluate whether children can learn to retrieve a toy supported on the far end of a towel by pulling the towel toward them. This type of behavior is called means-end behavior: one object is used as a means to retrieve/control/affect another object that is the real focus of the child's attention and interest.

Setup:

For the assessment, the child is seated in a chair or in the caregiver's lap at a table surface. The child should be provided 3, 30-second trials to interact with the towel when a small and interesting toy is placed on the far end of the towel, out of the child's reach. The child's visual attention should be drawn to the toy to elicit interest before the placement of the object on the towel for each trial. Adults and others should not cue the child how to behave during the trials, nor should they model the means-end behavior between trials. Each of these trials ends when the child touches the toy, when 30 seconds have elapsed or when the child moves the testing materials out of reach (e.g., via pulling the towel too hard and dropping materials to the floor).

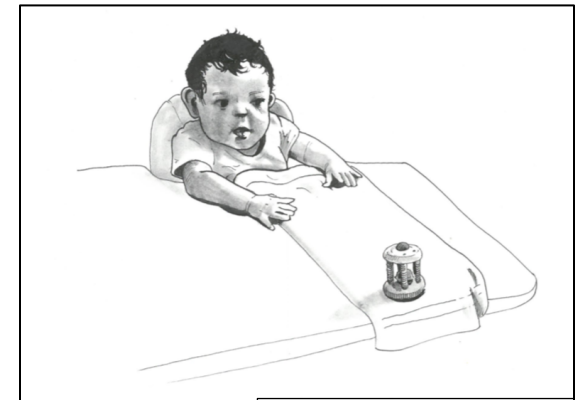


Illustration by: Platon Babik

The assessment may be scored in real time or from video recorded on a camera or smart device using the *Means-End Problem-Solving Assessment Tool* (MEPSAT). For scoring, assessors should use the scoring sheet and follow the coding instructions described below.

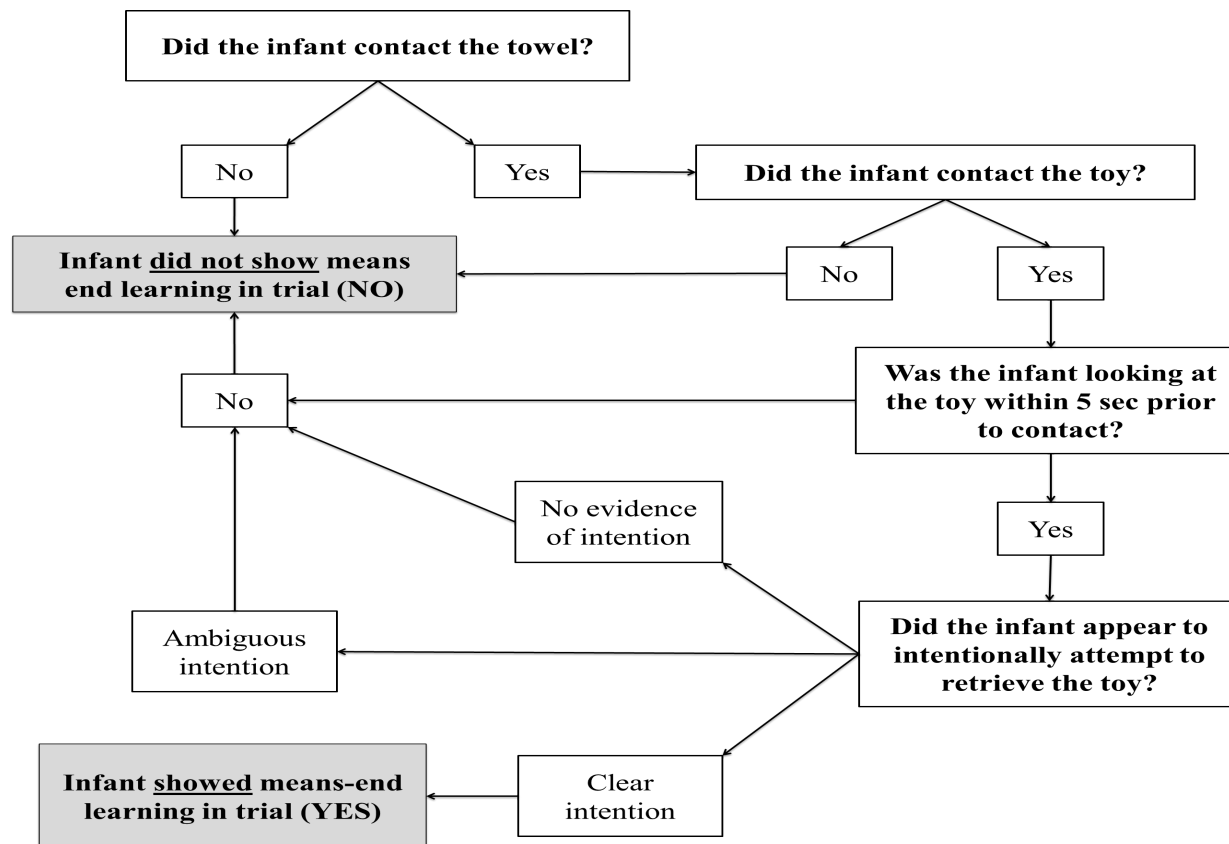
MEPSAT Scoring Sheet:

Trial	Towel Contact (0=no, 1=yes)	Toy Contact (0=no, 1=yes)	Looking at Toy (0=no, 1=yes)	Intentionally (0=no evidence or unclear intention, 1=clear intention)	Means End Learning (0=no, 1=yes)	Means End Performance (scores' range from 0 to 9)
1						
2						
3						

Instructions for Coding Behaviors Using the MEPSAT:

The MEPSAT provides two outcomes: 1) a determination of whether successful MEPS was demonstrated (*means-end learning*), and 2) a rating of the *level of means-end performance* (1-9 interval scale).

1) Determination of *means-end learning* (0=no, 1=yes)



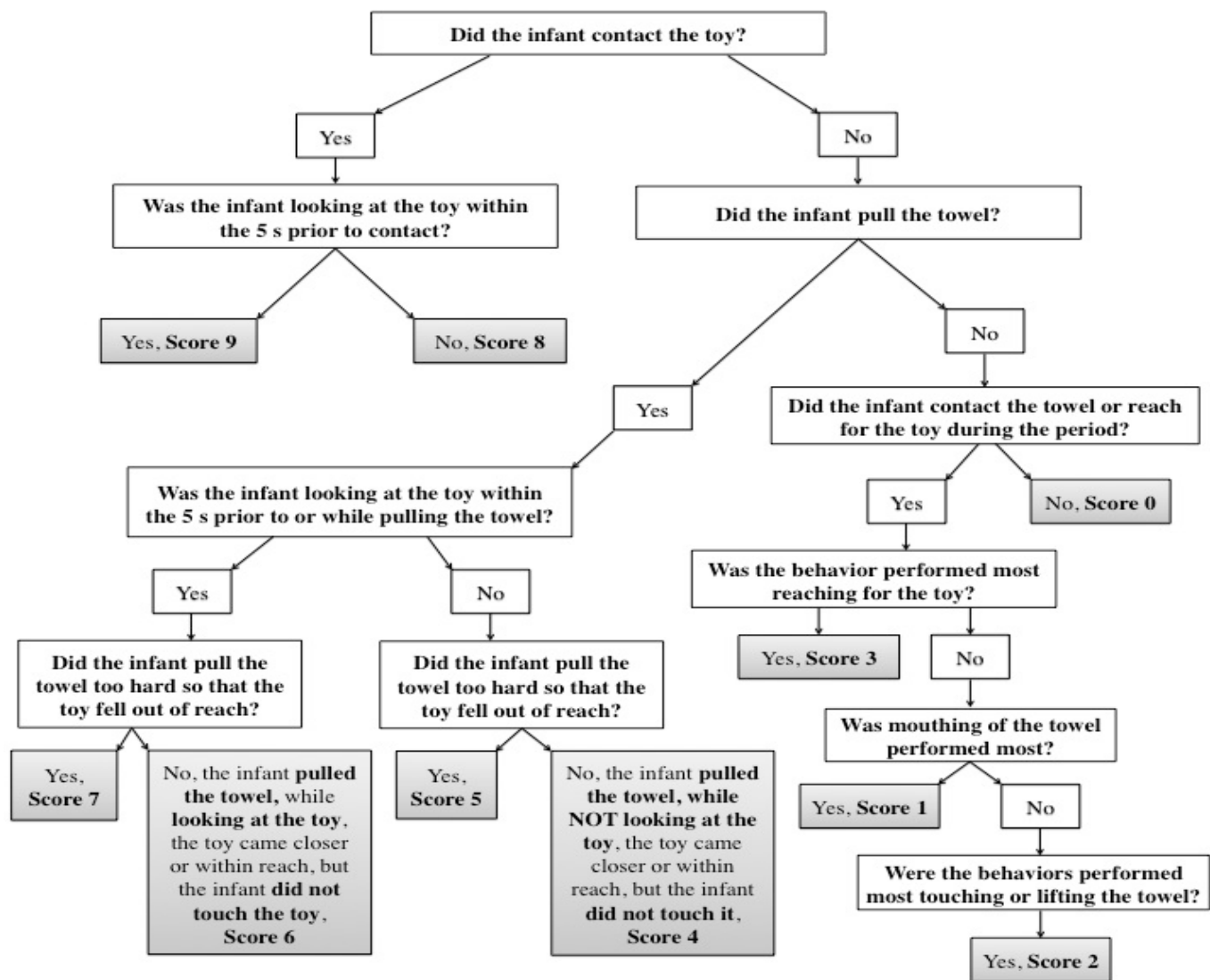
To achieve a score of 1 for means end learning in a trial, the child must score 1 in all of the outcome variables listed below:

- *Towel Contact*: Record whether the child contacted the towel (0=no, 1=yes) within the 30-second trial.
- *Toy Contact*: Record whether the child contacted the toy (0=no, 1=yes) within the 30-second trial.
- *Looking at the Toy*: If the child contacted the toy in the trial, also record whether the child looked at the toy in the 5 seconds prior to toy contact (0=no, 1=yes)
- *Intentionality*: Determine whether the child appeared to intentionally attempt to retrieve the toy (0=no evidence of intention, unclear/ambiguous intention, 1=clear intention -- based on focus on the toy, interaction with the towel in a manner aimed at retrieving the toy, looking at the toy, grasping the toy)

2) Rating the *level of means-end performance* (scale from 0 through 9)

The levels of means-end performance are listed and described below on a scale from 0 through 9, with 9 reflecting the highest level of performance.

Score	Level of Means-End Performance
0	No towel contact
1	Mostly mouthed the towel
2	Mostly touched/lifted the towel
3	Mostly reached for the out-of-reach end toy
4	Pulled the towel without looking at the toy, toy moved closer
5	Pulled the towel too hard without looking at the toy, toy fell out of reach
6	Pulled the towel while looking at the toy, toy came closer
7	Pulled the towel too hard while looking at the toy, toy fell out of reach
8	Contacted the toy without looking at it
9	Contacted the toy while looking at it



Scoring Guidelines:

Level of means end performance is rated based on the variables described above (for scoring of means end learning) as well as on the occurrence of the following behaviors during each trial:

- A) *Mouthing the towel* – mouth, tongue, or lips in contact with the towel;
- B) *Touching the towel* - hand(s) statically touching or feeling the towel, but not moving it;
- C) *Lifting the towel* – lifting at least half of the towel without pulling it;
- D) *Reaching for the out-of reach toy* – extending the arm(s) for the out-of-reach toy;
- E) *Pulling the towel* – pulling or sliding the towel in any direction on the surface

Note: The novel MEPSAT is supported by validity and reliability evidence. It is sensitive to detect problem-solving differences among young children with varying motor ability and to capture changes in problem solving across time. It is a promising tool for clinicians to screen for early problem-solving delays or to track intervention progress in young children with or at risk for problem-solving delays (Cunha et al., 2021)

Publication: Cunha, A. B., Babik, I., Koziol, N. A., Hsu, L. Y., Nord, J., Harbourne, R., Westcott-McCoy, S., Dusing, S. C., Bovaird, J., & Lobo, M. A. (2021). A novel means-end problem-solving assessment tool for early intervention: Evaluation of validity, reliability and sensitivity. *Pediatric Physical Therapy*, 33(1), 2–9. doi: 10.1097/PEP.0000000000000761

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Modifications of the one-step towel-pull task

You can modify the one-step towel-pull task to a two- to three-step planning tasks if you want to challenge the child.

Two-step towel-pull task:

The goal object is placed at the end of the cloth (similar to one-step towel-pull task) under/behind a transparent barrier. The child has to pull the towel and remove the barrier to retrieve the toy.



Illustration by: Julia Harmon

Three-step towel-pull task:

The goal object is placed off the cloth with a string connected to the object resting on the cloth out of the infant's reach. The child has to pull the towel to get the string, and then must pull the string to retrieve the toy.



Illustration by: Julia Harmon