

HEAD TOES KNEES SHOULDERS (HTKS)

Description of the Instrument:

- Children are asked to play a game in which they must do the opposite of what the experimenter says. The experimenter instructs children to touch their head (or their toes), but instead of following the command, the children are supposed to do the opposite and touch their toes. If children pass the head/toes part of the task, they complete an advanced trial where the knees and shoulders commands are added. The HTKS task has been conceptualized by Ponitz, et al., (2008) as a measure of inhibitory control (a child must inhibit the dominant response of imitating the examiner), working memory (a child must remember the rules of the task) and attention focusing (must focus attention to the directions being presented by the examiner).



Base Reference/Primary Citation:

Ponitz, C. C., McClelland, M. M., Jewkes, A. M., Connor, C. M., Farris, C. L., & Morrison, F. J. (2008). Touch your toes! Developing a direct measure of behavioral regulation in early childhood. *Early Childhood Research Quarterly*, 23, 141–158. doi: 10.1016/j.ecresq.2007.01.004.

Ponitz, C. C., McClelland, M. M., Matthews, J. S., & Morrison, F. J. (2009). A structured observation of behavioral regulation and its contributions to kindergarten outcomes. *Developmental Psychology*, 45, 605-619. doi: 10.1037/a0015365



Psychometric Information (sample, reliability, validity):

Average Task Performance across Early Childhood

Age	HTKS (0-40)		Head-to-Toes (HTT; 0-20)		
	Ponitz 2009 (Oregon)	Ponitz 2009 (Michigan) Matthews et al.	Ponitz 2008	McClelland et al. (Oregon)	McClelland et al. (Michigan)
3			3		
3.5			4.3		
4			9.5		
4.5			12.3	8.86 (7.52)	10.42 (7.61)
5			14	13.23 (6.83)	13.24 (6.34)
5.5	26.80 (10.57)	27.50 (9.62)	17		
6	28.00 (11.39)	32.30 (7.55)	18		
6.5			19		

- Ponitz, McClelland, Matthews, & Morrison (2009) - Oregon:** 62 kindergarteners participated at the Oregon site at time 1 and 59 of those children participated in the study at time 2. The site was mixed-SES and rural. Compared with Michigan kindergarteners, children in Oregon were 2.3 months older in the fall ($M = 5.63$), and their parents had lower levels of education by 1.5 years ($M = 14.42$). There were more ethnic minorities in the Oregon sample: 56% White, 24% Latino, 13% Asian, and 7% other. No significant differences by examiner in the fall in total scores and average number of self-corrects ($p > .05$). In the spring, examiner differences emerged for total score, $F(11, 169) = 4.58, p < .01$ and self-corrects, $F(11, 169) = 5.25, p < .01$. Cross-examiner consistency for total score and self-correct responses was 66% and 75%, respectively.
- Ponitz et al., (2009) – Michigan and Matthews, Ponitz, & Morrison (2009):** 265 kindergarteners participated at the Oregon site at time 1 and 255 of those children participated in the study at time 2. The site was predominantly middle- to upper-middle class. Participants in Michigan had on average 10 fewer months of child care and preschool experience relative to Oregon participants ($M = 12.48$). The Michigan sample was 77% White, 8% Asian, 7% African American, 6% Arabic, and 3% Latino. No significant differences across examiners were found in overall scores and self-correct responses in the fall or spring all $ps > .05$).
- Ponitz, McClelland, Jewkes, Connor, Ferris, & Morrison (2008):** There were two sites, one in Oregon and one in Michigan. The Michigan sample consisted of 353 children (178 girls). The average education level attained for both mothers and fathers was 16.0 (1.6). On average, children had spent about 13.9 months in childcare prior to data collection at Time 1 (S.D. = 16.15). Of the 319 children for whom we could obtain ethnicity, 76% were Caucasian, 8% were African American, 7.5% were East Indian or Asian, 2.5% were Latino/a, and 6% were Middle Eastern. The Oregon sample consisted of 92 children (48 girls). The mean parent education level was 14.6 years (3.9). On average, children had spent about 22 months in childcare prior to data collection at Time 1 (S.D. = 18.07 months). The Oregon sample was 48% Caucasian, 25% Latino, 19% Asian, and 8% other ethnic groups. At the Oregon site, no examiner differences found at Times 1–3 for both total scores and self-corrects, but a significant difference was found at Time 4 in total scores, $F(7, 51) = 2.95; p < 0.05$. This was due to one examiner, who only tested Spanish-speaking children, who had scored lower on the Head-to-Toes Task compared to other children in the study. At the Michigan site, no examiner differences found at Times 1–3 for total scores and self-corrects. At Time 4, a significant difference emerged for self-

corrects, $F(5, 242) = 5.26, p < 0.01$. Two out of six raters gave significantly higher average numbers of self-corrected responses, although this did not produce a difference in overall score.

- **McClelland, Cameron, Connor, Farris, Jewkes, & Morrison (2007) - Oregon:** 93 pre-k children participated at the Oregon site. The site was mixed-SES and rural. Children on average had spent about 22 months in child care prior to data collection. The average education level attained for mothers and fathers was approximately 14.63 years. The sample was 48% Caucasian, 25% Latino, 19% Asian, and 8% other ethnic groups. High interrater reliability was established on the HTT ($\kappa = .90$). No rater differences were found for both Fall and Spring testing, $F(5, 80) = 1.08, p > .05$ and $F(9, 72) = 0.76, p > .05$, respectively.
- **McClelland et al. (2007) – Michigan:** 217 pre-k children participated at the Oregon site. The site was predominantly middle- to upper-middle class. Children had spent an average of almost 12 months in child care prior to data collection. The average education level attained for both mothers and fathers was 15.95 years. 76% were Caucasian, 9% were African American or biracial, 7% were East Indian or Asian, 2% were Latino/a, and 6% were Middle Eastern. No rater differences were found for both Fall and Spring testing, $F(13, 181) = 1.36, p > .05$ and $F(13, 191) = 1.22, p > .05$, respectively.

HTKS TASK SCRIPT

Administer the task while seated; the child should stand, about 3 feet from you, throughout the entire task. The person symbol indicates to demonstrate the correct body motions.

If the child produces the correct response immediately, score the item “2”. If they self-correct right away, without prompting, score the item “1”. If they do not touch the correct part of their body at all, score the item “0”.

Copy Practice:

**Now we’re going to play a game. The game has two parts. First, I want you to copy what I do.
Touch your head.**

Wait for the child to put BOTH his/her hands on head.



Good! Now touch your toes.

Wait for the child to put his/her hands on toes.

Good!

Repeat the two commands with motions again, or until the child imitates you correctly. (*keep having child copy*)

Touch your head.

Touch your toes.

Now we're going to be a little silly and do the opposite of what I say. When I say to touch your head, *instead* of touching your head, you touch your toes. When I say to touch your toes, you touch your head. So you're doing something different from what I say.

A1. What do you do if I say "touch your head"?

Circle child's response on the code sheet.

- If s/he hesitates or responds incorrectly, say:
Remember, when I say to touch your head, you touch your toes, so you are doing something different from what I say. Let's try again. Repeat A1 again.

**If a child says an answer say:
Show me**

- If s/he responds correctly, say and proceed to A2:
That's exactly right.

A2. What do you do if I say "touch your toes"?

- If s/he hesitates or responds incorrectly, say:
Remember, when I say to touch your toes, you touch your head, so you are doing something different from what I say. Let's try again. Repeat A2 again.
- If s/he responds correctly, say and proceed to B2:
That's exactly right.

Circle child's response on the code sheet.

You may re-explain (use EXPLANATION above) up to three times in the TRAINING (A1-A2) and PRACTICE (B1-B4) sections. If you have already given two explanations during the TRAINING questions, then you may correct them only once more in the PRACTICE items. If the child cannot do the task after the third explanation, administer the 10 test items anyway.

PART I PRACTICE:

- B1. **Touch your head**
- B2. **Touch your toes**
- B3. **Touch your head**
- B4. **Touch your toes**

You may use any of the remaining retraining (up to 3 total on both rules and practice) on the practice:

Remember, when I say to touch your toes (head), you touch your head (toes), so you are doing something different from what I say. Let's try again.

PART I TESTING:

We're going to keep playing this game, and you keep doing the opposite of what I say.

If the child does not understand the task, you will have gone through the directions at most four times (once at the beginning, and up to three times in the TRAINING and PRACTICE sections). **DO NOT explain again after testing begins.**

- 1. Touch your head
- 2. Touch your toes
- 3. Touch your toes
- 4. Touch your head
- 5. Touch your toes
- 6. Touch your head
- 7. Touch your head
- 8. Touch your toes
- 9. Touch your head
- 10. Touch your toes

PART II TRAINING:

Administer Part II if child responds correctly to 5 or more items on Part I of the task, or if child is in kindergarten or beyond.

Ok, now that you've got that part, we're going to add a part. Now, you're going to touch your shoulders and your knees. First, touch your shoulders.

Touch your shoulders; wait for the child to touch his/her shoulders with both hands.

Now, touch your knees.

Touch your knees; wait for the child to touch his/her knees with both hands.

Repeat with four alternating commands (no demo) until the child has imitated you correctly or it is clear the child does not comprehend the task.

Touch your shoulders

Touch your knees

Touch your shoulders

Touch your knees

Ok, now we're going to be silly again. You're going to keep doing the opposite of what I say like before. But this time, you're going to touch your knees and shoulders. When I say to touch your knees, you touch your shoulders, and when I say to touch your shoulders, you touch your knees.

C1. What do you do if I say "touch your knees?"

- If response is correct, say and proceed to D1:

Good job! Let's practice.

- If the response is incorrect, say and proceed to D1:

Remember, when I say to touch your knees, *instead* of touching your knees, you touch your shoulders. I want you to do the opposite of what I say. Let's try again.
Repeat C1 again.

**If a child says an
answer say:
Show me**

PART II PRACTICE:

- D1. **Touch your knees**
- D2. **Touch your shoulders**
- D3. **Touch your knees**
- D4. **Touch your shoulders**

You may use any of the remaining retraining (up to 3 total on both rules and practice) on the practice:

Remember, when I say to touch your knees (shoulders), you touch your shoulders (knees), so you are doing something different from what I say. Let's try again.

- **If the child gets two or fewer correct, say:**

Remember, I want you to keep doing the opposite from what I say, but this time, touch your knees and shoulders.

Proceed to Part II test section. Do not explain any parts of the task again.

PART II TESTING:

Now that you know all the parts, we're going to put them together. You're going to keep doing the opposite from what I say to do, but you won't know what I'm going to say.

There are four things I could say.

If I say to touch your head, you touch your toes.

If I say to touch your toes, you touch your head.

If I say to touch your knees, you touch your shoulders.

If I say to touch your shoulders, you touch your knees.

Are you ready? Let's try it.

- | | |
|-----|----------------------|
| 11. | Touch your head |
| 12. | Touch your toes |
| 13. | Touch your knees |
| 14. | Touch your toes |
| 15. | Touch your shoulders |
| 16. | Touch your head |
| 17. | Touch your knees |
| 18. | Touch your knees |
| 19. | Touch your shoulders |
| 20. | Touch your toes |

After the child completes the task, say:

Thank you for playing this game with me today!

HTKS RECORD FORM

*If the child produces the correct response immediately, score the item “2”. If they self-correct (*see bottom of page 2) right away, without prompting, score the item “1”. If they do not touch the correct part of their body at all, score the item “0”.*

Part 1 TRAINING: (circle child’s response)

A1. What do you do if I say “touch your head”?		
0 (head)	1	2 (toes)

Retraining

A2. What do you do if I say “touch your toes”?		
0 (toes)	1	2 (head)

PART I PRACTICE: (circle child’s response)

	Incorrect	Self-Correct*	Correct	
B1. Touch your head	0 (head)	1	2 (toes)	Retraining
B2. Touch your toes	0 (toes)	1	2 (head)	
B3. Touch your head	0 (head)	1	2 (toes)	
B4. Touch your toes	0 (toes)	1	2 (head)	

****Retraining occurs only 3 times****

PART I TESTING: (circle child's response)

		Incorrect	Self-Correct*	Correct
21.	Touch your head	0 (head)	1	2 (toes)
22.	Touch your toes	0 (toes)	1	2 (head)
23.	Touch your toes	0 (toes)	1	2 (head)
24.	Touch your head	0 (head)	1	2 (toes)
25.	Touch your toes	0 (toes)	1	2 (head)
26.	Touch your head	0 (head)	1	2 (toes)
27.	Touch your head	0 (head)	1	2 (toes)
28.	Touch your toes	0 (toes)	1	2 (head)
29.	Touch your head	0 (head)	1	2 (toes)
30.	Touch your toes	0 (toes)	1	2 (head)

Total Points: _____

Number of 1 responses: _____

NOTE

***Definition of self-correction:** Mark "self-correct" on both the training and testing portion if the child makes *any discernible* motion toward the *incorrect* answer, but then changes his/her mind and makes the correct response. Pausing to think, not moving, and then responding correctly does *not* count as a self-correction.

PART II TRAINING:

Administer Part II if child responds correctly to 5 or more items on Part I of the task, or if child is in kindergarten or beyond.

Circle child's response:

<p>C1. What do you do if I say "touch your knees?"</p> <p>0 (knees) 1 2 (shoulders)</p>	Retraining

PART II PRACTICE:

	Incorrect	Self-Correct*	Correct	
D1. Touch your knees	0 (knees)	1	2 (shoulders)	Retraining
D2. Touch your shoulders	0 (shoulders)	1	2 (knees)	
D3. Touch your knees	0 (knees)	1	2 (shoulders)	
D4. Touch your shoulders	0 (shoulders)	1	2 (knees)	

PART II TESTING: (circle child's response)

		Incorrect	Self-Correct	Correct
31.	Touch your head	0	1	2 (toes)
32.	Touch your toes	0	1	2 (head)
33.	Touch your knees	0	1	2 (shoulders)
34.	Touch your toes	0	1	2 (head)
35.	Touch your shoulders	0	1	2 (knees)
36.	Touch your head	0	1	2 (toes)
37.	Touch your knees	0	1	2 (shoulders)
38.	Touch your knees	0	1	2 (shoulders)
39.	Touch your shoulders	0	1	2 (knees)
40.	Touch your toes	0	1	2 (head)

Total Points: _____

Number of 1 responses: _____

HTKS SCORING

Each item is coded as follows (Ponitz et al., 2008):

0 = Incorrect response

1 = Any motion to incorrect response, but self-corrected to end with correct response

2 = Correct response

Final Score:

The task has begins with 6 practice items and between the first and second set of items there are 5 more practice trials. The final score is the sum of the first six practice items and the 20 test items. (Range: 0-52)